

UNIV. OF
CALIFORNIA
—
COLLEGE OF
AGRICULTURE
—
GENERAL
CATALOGUE
—
PROSPECTUS
—
TWO-YEAR
CURRICULA

1946-47

UNIVERSITY OF CALIFORNIA
BULLETIN

**GENERAL
CATALOGUE**

Primarily for Students in the
DEPARTMENTS AT BERKELEY

Fall and Spring Semesters

1946-1947

For Sale by the
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UNIVERSITY OF CALIFORNIA

General Catalogue

UNIVERSITY OF CALIFORNIA

General Catalogue

Admission and Degree Requirements

*Announcement of Graduate and
Undergraduate Courses of Instruction*

FOR THE FALL AND SPRING SEMESTERS

1946-1947

Primarily for Students in the
DEPARTMENTS AT BERKELEY

BERKELEY • CALIFORNIA

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CALENDAR, 1946-1947

Referring Primarily to the Departments of the University at Berkeley

FALL SEMESTER, 1946-1947

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 Director of Admissions at the earliest possible date.

Aug. 31, Saturday	Final date for applications for admission to the fall semester and credentials to be filed with the Director of Admissions. Credentials received as late as this may not be evaluated in time for the enrollment of the student during the regular registration period.	
Aug. 31, Saturday	Applications for readmission to the fall semester to be filed with the Registrar by former students, graduate and undergraduate.	
Sept. 14, Saturday	Preengineering Inventory Examination required of all students entering the College of Engineering with less than Junior standing in that college.	
Sept. 16, Monday	Subject A Examination, 9 A.M.-12 M. Other qualifying examinations for admission to certain classes, afternoon.	
Sept. 17, Tuesday Sept. 18, Wednesday Sept. 19, Thursday Sept. 20, Friday Sept. 21, Saturday	} Registration of students, graduate and undergraduate, in the Departments at Berkeley for courses of the fall semester.	
Sept. 23, Monday		Instruction begins.
Oct. 3, 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, 1947, file announcement of candidacy before 5 P.M., at the Office of the Registrar, Administration Building.
Oct. 7, Monday		Last day for filing applications in candidacy for the Master's degree, and the degrees of Engineer and Graduate in Architecture, to be conferred in February, 1947; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 12, Saturday		Columbus Day (an academic and administrative holiday).
Oct. 14, 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, 1947; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.	
Oct. 28, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in February, 1947; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.	
Nov. 23, Saturday	Last day for filing in final form with the committees in charge, theses 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 February, 1947.	
Nov. 28, Thursday Nov. 28, Thursday Nov. 30, Saturday	} Thanksgiving Day (an academic and administrative holiday).	
Dec. 23, Monday Jan. 8, Wednesday		} Thanksgiving Recess (an academic holiday).
Dec. 25, Wednesday	} Christmas Recess (an academic holiday).	
	Christmas Day (an academic and administrative holiday).	

Dec. 31, Tuesday	Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1947-1948.
Jan. 1, Wednesday	New Year's Day (an academic and administrative holiday).
Jan. 9, Thursday	Last day for filing in final form with the committees in charge, theses for the Master's degree and the degrees of Engineer and Graduate in Architecture, to be conferred in February, 1947.
Jan. 27, Monday	} Final examinations in the Departments at Berkeley.
Feb. 6, Thursday	
Feb. 6, Thursday	} Fall semester ends.
Feb. 7, Friday	} Spring Recess.
Feb. 19, Wednesday	
Feb. 12, Wednesday	Lincoln's Birthday (an administrative holiday).

SPRING SEMESTER, 1947

Jan. 20, Monday	Applications for admission to the spring semester and credentials to be filed with the Director of Admissions.
Jan. 30, Thursday	Applications for readmission to the spring semester to be filed with the Registrar by former students, graduate and undergraduate.
Feb. 15, Saturday	Last day for entering students to file applications for undergraduate scholarships for 1947-1948.
Feb. 20, Thursday	Last day for filing applications for fellowships and graduate scholarships for 1947-1948.
Feb. 18, Tuesday	} Registration of students, graduate and undergraduate, in the Departments at Berkeley for courses of the spring semester.
Feb. 19, Wednesday	
Feb. 20, Thursday	
Feb. 21, Friday	
Feb. 22, Saturday	
Feb. 24, Monday	Instruction begins.
Mar. 6, 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, 1947, file announcement of candidacy before 5 P. M., at the office of the Registrar, Administration Building.
Mar. 10, Monday	Last day for filing applications in candidacy for the Master's degree and the degrees of Engineer and Graduate in Architecture, to be conferred in June, 1947; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 17, 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 October, 1947; office of the Dean of the Graduate Division, 207 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 17, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula, to be received in June, 1947; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Apr. 5, Saturday	Last day for filing in final form with the committees in charge, theses 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, 1947.
May 19, Monday	Last day for filing in final form with the committees in charge, theses for the Master's degree and the degrees of Engineer and Graduate in Architecture, to be conferred in June, 1947.
May 30, Friday	Memorial Day (an academic and administrative holiday).
June 9, Monday	} Final examinations in the Departments at Berkeley.
June 19, Thursday	
June 19, Thursday	

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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. University publications available to inquirers are listed on the cover pages of this catalogue.

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Russell Erikson, *Assistant Training
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THE UNIVERSITY OF CALIFORNIA

FOUNDED 1868

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

I. AT BERKELEY

The Colleges of

Letters and Science,

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

Chemistry,

Engineering,

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

The Schools of

Architecture,

Business Administration,

Education,

Forestry,

Jurisprudence,

Librarianship,

Medicine (first year),

Nursing (in part),

Optometry,

Public Health (in part),

Social Welfare,

The Graduate Division (Northern Section).

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

The California Museum of Vertebrate Zoölogy.

The Museum of Paleontology.

The Anthropological Museum.

The Institute of Child Welfare.

The Institute of Experimental Biology.

The Institute of Industrial Relations.

The Bureau of International Relations.

The Bureau of Public Administration.

The William H. Crocker Radiation Laboratory.

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, Classics (Greek, Latin, Sanskrit), Decorative Art, Dramatic Art, Economics, Education, Engineering (civil, electrical, irrigation, mechanical, mining, metallurgy and petroleum), English, Forestry, French, Geography, Geological Sciences (and Mineralogy), German, History, Italian, Journalism, Jurisprudence, Librarianship, Mathematics, Military Science and Tactics, Music, Naval Science and Tactics, Near Eastern Languages, Nursing, Optometry (and Physiological Optics), Oriental Languages, Paleontology, Philosophy, Physical Education, Physics, *Physiology, Political Science, Psychology, Public Health, Public Speaking, Romance Philology, Scandinavian Languages and Literature, Slavic Languages, Social Welfare, Sociology and Social Institutions, Spanish and Portuguese, 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 Public Health (in part),
 Graduate Division, Southern Section,
 The Summer School of Surveying,
 Bureau of Governmental Research,
 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 Willams Hooper Foundation (for Medical Research),
 College of Dentistry,
 College of Pharmacy,
 California School of Fine Arts,
 Hastings College of the Law.

* A division of the Medical School.

† A more detailed description of instruction offered at Los Angeles will be found on page 20.

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 officers of the University at Berkeley, and elsewhere, see pages 9-12.

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 technology.

College of Engineering. The student in this college may elect Agricultural Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Mining, Metallurgy, Economic Geology, or Petroleum 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, industrial electronics and control, illumination, power systems, power machinery, power plants, and business administration.

In Mechanical Engineering, the student has a choice of options in aeronautics, air conditioning and refrigeration, automotive, chemical, 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 Economic Geology the student may elect mining geology or petroleum geology.

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, dentistry, education, 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 catalogue.

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, 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. Further details will be published in a 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 catalogue 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 Certificate of Librarianship, and at the end of the second (sixth) year to the degree of Master of Arts.

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, and three years in the School of Nursing.

The School of Optometry offers a curriculum of two years based on 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 and the Certificate of Completion in Optometry.*

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:

* The expansion of the Curriculum in Optometry to a five-year program is under consideration. Ample notice will be given later as to the exact date on which any change in the program is to become effective.

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. (NOTE.—Although this School has been established at the University, the organization of it is not yet complete, and applications for admission cannot be accepted at the present time.)

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.

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 Com-

pletion 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.

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; and (f) the School of Education, with teacher-training curricula leading to certificates of completion for the general secondary and junior college credentials. Graduate studies, leading to the degrees of Master of Science and Master of Arts, and to the degrees of Doctor of Education and Doctor of Philosophy 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 1946 two such summer sessions of six weeks each were conducted, the first session beginning June 24, and the second beginning August 5. Information concerning the Summer Sessions of 1947 will be published in the ANNOUNCEMENT OF THE SUMMER SESSIONS, obtainable upon request from the Director of Summer Sessions, 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 at Santa Barbara College.

UNIVERSITY EXTENSION

University Extension offers facilities to men and women who seek some form of higher education, but are prevented from taking up residence at the University.* Offerings are addressed increasingly to those who have been to college and who desire to advance themselves professionally. The University of California therefore provides through University Extension educational opportunities to adults living in any part of the State.

The work is carried on in five ways:

(1) Class Instruction. Classes are organized in cities and towns wherever a sufficient number of people can be secured who wish to study a subject. Instruction is offered in art, business administration, economics, education, engineering, geography, history, languages, law, literature, mathematics, political science, psychology, public speaking, science, etc.

(2) Correspondence Instruction. Courses are given by mail in art, astronomy, composition and literature, drawing, economics, education, engineering, history, the languages, mathematics, music, philosophy, physics, political science, psychology, etc. Courses may begin at any time.

(3) Institutes, for periods ranging from two days to several weeks, provide intensive familiarization courses for interested groups, under the leadership of experts in theory and practice.

(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 Instruction. The University Extension circulates instructional aids in the form of motion picture reels, which cover many phases of educational work.

For information concerning credit for extension courses, see pages 66-68. Persons desiring to take advantage of the facilities offered by any one of

* For information concerning admission to the University through residence courses in University Extension, see page 26.

these departments may receive detailed information on request. Address University Extension, University of California, Berkeley 4, or 813 South Hill Street, Los Angeles 14, or 130 Administration Building, University of California, Los Angeles 24, or 755 Cliff Drive, Santa Barbara.

THE UNIVERSITY LIBRARY

The Library of the University of California at Berkeley consists of one main collection, three branch libraries, and eighty-five departmental and special libraries. These groups, collectively known as the University Library, contain more than 1,260,000 volumes, plus approximately 15,500 periodicals and serials which are received currently.

The principal collection, called the Main Library, is housed in the Charles Franklin Doe Library Building. It 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 Education Library in Haviland Hall and the Engineering Library in the Engineering 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.

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 Bancroft Library of far western and Pacific Coast history is on the fourth floor of the same 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, Chemistry, 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 Director of Admissions, 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.

Admission in Freshman Standing

Admission by Certificate—

A graduate of an accredited high school may enter the University of California in freshman standing provided the following conditions have been met (see statement on page 31 regarding admission of returning veterans; see also page 98 for special requirements for admission to the College of Engineering:

1. *Graduation.* Graduation from an accredited high school usually requires the completion of sixteen matriculation units or credits in selected subjects.

2. *Subject requirements.* The high school program must include the following subjects, (a) to (f), inclusive, which represent the minimum subject requirements, and which must be approved by the high school principal as college preparatory courses.*

- (a) History 1 unit. —Effective June, 1946, 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 zoölogy. The science selected must be an advanced (3d or 4th year) laboratory science, and the two semesters must be in the same subject field.

* Although this minimum program will entitle the students 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 catalogue.

† 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.

- (e) Foreign language 2 units.—These must be in one language.
- (f) Advanced (3d or 4th year) mathematics, or foreign language, or chemistry, or physics—1 unit; or two years of a second language—2 units
1 or 2 units.

3. *Scholarship requirement.* For any of these required subjects completed in the ninth grade (first year of high school), *subject credit* is given irrespective of the scholarship grade received, provided, of course, it is a passing grade. In the subjects completed in the *last three years* of the high school program, however, a scholarship *average* of grade B (based on a marking system of four passing grades: A, B, C, D) must have been maintained. In computing scholarship averages *semester grades* rather than year grades are used. For example, a semester grade A in either half of one prescribed course may be used with a semester grade C in either half of any other prescribed course to obtain a B average. Required subjects taken in the last three years of high school in which a grade D has been received will not be counted either in reckoning the required scholarship average or in satisfaction of the subject requirements. A grade earned by repeating a course, in which the original mark was not higher than C, may be counted.

Subject A: English Composition. An examination in English composition designed to test the applicant's ability to write English without gross errors in spelling, grammar, sentence structure, and punctuation, is required of all undergraduate intrants. The examination is given at the opening of each semester and at the opening of the Summer Sessions. Students who do not pass in the examination are required to take the Course in Subject A without unit credit toward graduation.

Additional Ways of Gaining Admission

The above-enumerated subjects have been selected as a central core of academic subjects for preparation for entrance to this University. It has been demonstrated that the student who completes them satisfactorily is most apt to be successful in his University work. In keeping, however, with the University's policy that no worthy student shall be denied admission, the Board of Admissions has been authorized to make certain exceptions to the general rules governing entrance for an applicant who may have subject shortages but a *superior* scholarship record. Every such applicant, upon submitting his official transcript of record, is given special consideration by the Director of Admissions. In general, an applicant with superior scholarship but with subject shortages may qualify for entrance to the University of California as follows:

- (1) If he ranks in the upper tenth of his class and has a substantial academic preparation, although he may have subject deficiencies.
- (2) If he has not less than 15 high school units of grade A or B in work taken

Admission Requirements

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).

(3) If he has 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.

(4) If he has 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 passes the *Examination in Subject A*; and has 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.

Removal of Admission Deficiencies

Deficiencies in the subject or scholarship requirements for admission in freshman standing by certificate may be removed in any one of the following ways:

(1) By courses in the University of California Extension which offers work of high school level, and college courses (class or correspondence) which may be taken to remove entrance deficiencies. Work taken in the University Extension must be performed by achieving a standard satisfactory to the Board of Admissions, and the program of studies of the students must be approved by the Director of Admissions or by one of his associates, Berkeley or Los Angeles.

(2) By courses in the University of California Summer Sessions (Berkeley or Los Angeles). Elementary college courses and a limited number of courses of high school level are offered. Advice respecting the selection of these courses should be obtained from the Director of Admissions or from one of his associates, Berkeley or Los Angeles.

(3) By courses in the College of Agriculture of the University of California at Davis (for applicants for admission to the College of Agriculture). Minor entrance deficiencies may be removed by an appropriate program made up of two-year or degree courses, or by a program combining both types of work. See

under Provisions for Transfer from the Two-Year to the Four-Year Curricula, in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

(4) By courses in other four-year colleges completed with satisfactory grades subject to the approval of the Director of Admissions. The requirements for admission in advanced standing must also be satisfied (see page 29).

(5) By courses in junior colleges or state colleges completed with satisfactory grades and in proper amount. In addition, all requirements for admission to the University in advanced standing must be satisfied. The high school record of an applicant for admission with advanced standing from another collegiate institution will be considered on the same basis as the high school record of a student applying for admission to freshman standing in the University, provided his college record is satisfactory. Students who remove deficiencies in this way must continue in junior college or state college long enough to make up entrance deficiencies and, in addition, complete at least 15 units with a C plus average (1.5), or remain until completing 60 units with a C average (1.00). Students who completed the requirements in any one of the ways described on pages 24-26 will qualify for admission, provided they have at least a C average in all college work presented for advanced standing.

(6) By junior college noncertificate courses representing work of nonuniversity level taken after high school graduation. The scholarship standards for these courses are the same as those required for work taken in the high school.

(7) By postgraduate courses in accredited high schools.

(8) By College Entrance Board achievement and attainment tests.

Information Primarily for High School Principals and Faculty Advisers

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 on pages 24-27, 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 63-67) and thereby will give the student greater opportunity in his freshman and sophomore years at the University to choose elective subjects. However, it should be understood that neither chemistry nor physics is required for admission to the University.

Especial care should be exercised by the high school student in selecting a foreign language. High school Latin is valuable in itself and will satisfy either the (b) or (e) 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.

The high school student who plans to enter the University of California, but who at the outset of his high school course is uncertain concerning which of the several University curricula he may wish to follow, should provide himself with a wide range of opportunities by completing in high school a program of studies somewhat as follows: history, 1-4 units; English, 3-4 units; algebra, 1-2 units; geometry, 1-1½ units; trigonometry, ½ unit; language, 2-4 units; science, 1-4 units, including chemistry; mechanical drawing, 1 unit; special subjects, 1-4 units; a total of 16 units chosen from those listed above. Otherwise he may find graduation delayed, because he lacks proper matriculation prerequisites in required courses in the various colleges.

The student is cautioned with respect to the choice of electives that vocational or activities courses in the high school are not regarded as acceptable substitutes for basic academic studies in the preparation for University curricula. Unless this caution is observed, the student, even though he has been admitted to the University, may find that he is not equipped to do all the work necessary for the bachelor's degree in the normal four-year period.

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

Admission in Advanced Standing

An applicant for admission 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, as described on pages 61-66 (see also under Additional Ways of Gaining Admission, page 25), and that his advanced work in institutions of college standing has met the scholarship standard required of transferring students; namely, an average of grade C or higher in all courses of college level undertaken.

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

An applicant from a junior college or state college in California, who upon graduation from high school did not qualify for admission in freshman standing, must submit evidence that he has made up all entrance deficiencies and, in addition, has completed:

(a) Not less than 60 semester units of work acceptable for advanced standing in the college of the University to which admission is sought, 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.

The student should note that credit toward a degree in the University of California for an extension course or courses completed in another institution will be allowed only upon the satisfactory passing at this University of an examination in the course or courses so offered, unless the other institution maintains a classification of extension courses similar to that established by the University of California.

Subject A: English Composition. Credit for Subject A (English Composition) is given upon certificate to those students who enter the University with credentials showing the completion elsewhere of the required training in composition. Of all other students, an examination by this University, at Berkeley or at other centers of instruction, is required.

Surplus matriculation credit. There is no provision for advanced standing in the University on the basis of surplus high school credit.

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

in grade points. This may be accomplished by work in (1) the Summer Sessions, (2) the University Extension, or (3) other approved higher institutions.

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 Director of Admissions. 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 Director of Admissions 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 the mere attainment of any given age is not in itself a qualification for admission.

An applicant will not be admitted directly from high school to the status of special student. Graduates of high schools are expected to qualify for admission in accordance with the usual 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—that is, for students who have had the equivalent of a good high school education and have been fully matriculated. 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.

Instruction is not offered in such essential preparatory subjects as elementary English, United States history, elementary physics, nor, except in the Summer Sessions† or in University Extension, in elementary algebra, plane geometry, or elementary chemistry.

Students more than 24 years of age at the time of admission are excused from military science.

* This minimum age requirement may be waived in the case of men and women having records of service with the armed forces of the United States who desire to enter the University as special students.

† See statement concerning the Summer Sessions on page 21.

ADMISSION OF RETURNING MEMBERS OF THE ARMED FORCES

Returning service men and women will be welcomed to all sessions of the University; those who are ineligible for admission to *regular status* will be given every consideration and will be admitted to *special status* if they present evidence of ability to do successfully the courses of the college in which they wish to register; others will be given programs of work in University Extension or in junior colleges designed to prepare them for University work.

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 Director of Admissions several months in advance of the opening of the term 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.

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. Applicants for admission to the graduate years of the Medical School in which registration is limited to sixty in each class should file their credentials with the Registrar for evaluation by the Director of Admissions. Such credentials should be accompanied by a money order or bank draft for \$5 in payment of the *application fee*.†

Applicants for admission to graduate work at the College of Agriculture at Davis,* the Lick Observatory on Mount Hamilton, the Hooper Foundation, and the College of Dentistry in San Francisco must first secure admission to the Graduate Division and authorization to pursue such work through the Dean of the Graduate Division, Northern Section. *In the absence of a diploma or other official evidence of graduation or degree, registration will not in any case be permitted.*

The Accepted List of the Association of American Universities is printed in the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION. Graduates of institutions not on this list may be admitted to the Graduate Division with the approval of the Dean of the Graduate Division if the evaluation of their certified college records by the Director of Admissions proves them eligible for graduate status. Every applicant for admission to the Graduate Division is required to pay an application fee of \$5 at the time the application is presented.† Remittance should be made payable to The Regents of the University of California.

The level of work to which graduate students are assigned, and their 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 information concerning all matters pertaining to the Graduate Division at Berkeley, including the list of available fellowships and graduate scholarships, and the requirements for all higher degrees and certificates see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, to be ob-

* 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.

† 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.

tained upon application to 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.

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 in general 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. An applicant for admission *after the first two weeks* of instruction must receive the special approval of the Director of Admissions and the dean of the college to which he seeks admission. His study list must also be approved by the dean and the instructors concerned.

Late admission from other institutions. A student in another college or university who desires to enter the University of California after stated registration days should, without fail, communicate in advance with the Director of Admissions, and then, before discontinuing his studies elsewhere, await assurance that late admission will be permitted. The applicant should state specifically the college in the University of California to which admission is sought. Such permission to register after the stated registration dates requires the approval both of the Director of Admissions and the dean of the college concerned.

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 are given an opportunity to 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. Evidence, satisfactory to the examiners, of successful immunization against smallpox is required. 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 term. 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.).

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. Groups of students may reserve a pool, gymnasium, etc., for their own use at stated times. Further information may be obtained from the Secretary, Room 200, Hearst Gymnasium.

SUBJECT A: ENGLISH COMPOSITION

With the exceptions noted below, every undergraduate intrant 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 intrants 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 \$10, 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

Candidates for the bachelor's degree to be awarded in June, 1947, or later, must satisfy the "Requirement of American History and Institutions," making a knowledge of the United States Constitution and of American History, including American institutions and ideals, a requirement for graduation.

This requirement may be satisfied in the following ways:

1. By passing examinations in American Institutions and American History. (No unit credit is given for these examinations.)
2. By completing in the University one course in each of the following groups:
 - (a) American Institutions: Political Science 1, 113, 150, 151, 157A, 157B; History 17A-17B (or 171A-171B), H1-H2 or XB17A-XB17B (Uni-

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versity Extension)*; American Institutions 101 (Summer Sessions) or XB7AB (University Extension).

(b) American History: History 17A (or 171A), H1, or XB17A (University Extension); History 17B (or 171B), H2, or XB17B (University Extension); History 172A-172B, 174A, 174B, 176A, 176B.

3. By passing the examination in American Institutions and completing one course in group 2(b) above, or by passing the examination in American History and completing one course in group 2(a) above.
4. By presentation of certificates of completion of acceptable courses at another collegiate institution.

Further information regarding this requirement, and examinations necessary to meet it, may be obtained from the Committee on American History and Institutions. For room number and office hours, see official announcements on campus bulletin boards.

MILITARY SCIENCE

All undergraduate men 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 with the Department of Military Science and Tactics within two weeks of the date of registration; exception will be made only if illness or physical disability occurs after that date.

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, after a reasonable time, 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. Upon the recommendation of the professor in charge of the work and with the approval of the President, the Registrar is authorized to reinstate the student and will notify the dean of the student's college (or other officer in charge of the student's study list) of such reinstatement.

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.

* Completion of any one of these History courses, A and B parts, will satisfy both requirements.

NAVAL SCIENCE AND TACTICS

Candidates for enrollment in the Naval Reserve Officers' Training Corps will be selected by the Professor of Naval Science and Tactics.

Applications will be accepted from 100 freshman students. Additional applications will be accepted from advanced students, within the limit of quota, who, because of previous military or naval training, can satisfy the Department of Naval Science and Tactics that they have received instruction equivalent to one or more naval science courses in the Naval R.O.T.C. curriculum; and from students without such training who have completed two or less semesters of college work. Candidates of either type must be able to meet all the requirements of the Naval R.O.T.C. curriculum before graduation, without seriously interfering with the academic work required for a bachelor's degree.

For further information about the work of the naval unit, consult the Professor of Naval Science and Tactics.

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 circular.

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 1946-1947 these dates are: Thursday, October 3, for candidates who expect to complete their work in February, 1947, and Thursday, March 6, for candidates for graduation in June, 1947.

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, 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 catalogue.

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) indicates a record below passing, but one which may be raised to a passing grade without repetition of the course by passing a further examination or by performing other tasks required by the instructor.

Grade F (not passed) denotes a record so poor that it may be raised to a passing grade only by repeating the course.

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

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

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

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

In the College of Dentistry, the student's work is reported, in reference to each course, as "passed" or "not passed." The Faculty of this College determines the conditions under which a grade of "not passed" may be raised to a grade of "passed." For the bachelor's degree in the College of Dentistry, or for the degree of D.D.S., the student must have obtained a grade of "passed" in every course in which he has been enrolled in that College in and after July 1, 1942.

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

Every student who desires to obtain his scholarship grades at the end of the semester should deposit with the Registrar a self-addressed stamped envelope for 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, Nursing, and Public Health—

Probation. A student will be placed on probation

(1) If at the close of his first semester his record shows a total deficiency of six or more grade points; or

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

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

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

(2) If while on probation his grade-point average for the work undertaken during any semester falls below one (a C average); or

(3) If after two semesters of probationary status he has not obtained a grade-point average of one (a C average), computed on the total of all courses undertaken in this University for which he has received a final report.

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

A student who becomes subject to the provisions of this regulation will also be subject to such supervision as the Faculty of his college or school may determine. The Faculty may dismiss from the University students under its supervision or may suspend the provisions of this regulation and permit the retention in the University of the students subject to dismissal, and the return to the University of students who have been dismissed under this regulation.

College of Engineering—

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

School of Optometry—

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

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

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

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

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

Graduate Division—

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

Medical School—

Matriculants in the Medical School who are pursuing all their work in that school are not subject to the foregoing regulations. For the rules governing scholarship requirements in the Medical School, reference should be made to the annual announcement of the 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 41). 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 EXERCISES 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 reexamination 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, reexaminations for the removal of deficiencies are not provided by the University.

Any examination, term paper, or other exercise which the instructor may require of the student in order to raise grade E to a passing grade in a course is a "condition examination." For every such examination a formal permit, to be obtained in advance from the Registrar, must be shown to the instructor in charge of the examination; otherwise he will lack authority to consider and report upon the work submitted by the student. For every course in which a special examination is undertaken with a view to raising grade E to a passing grade, a fee of \$2 is charged. The fee for a permit for two or more special examinations of this type is \$3. There is no fee for a reexamination (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.

Withdrawal on account of war service or military necessity. The following special provisions are made for undergraduate students who leave the University to enter the armed services of some one of the United Nations or because of military necessity:

(1) The bachelor's degree may be awarded to a senior who has completed half of his last semester's work, provided he would be eligible for consideration by the appropriate agency upon projecting his record at the time of leaving to the end of the semester. (2) A student who has completed at least six weeks' work of any semester may be given a grade in any course in which he is enrolled, based upon the work done to the date of withdrawal, and for a number of units, to the nearest half-unit, proportional to the amount of work completed by him. In so far as feasible, such students will be permitted to complete the credit for such courses by work in the University Extension (class work or correspondence) or by examination.

On application of the student and on recommendation of the Dean of Students, the provisions specified in the preceding paragraph may be applied also to any student whose withdrawal from the University is occasioned by military necessity.

In exceptional cases a student may be given credit on the basis of his semester record for a course in which he has received E or X in a previous semester through failure to take the final examination (because of illness or other unavoidable necessity), if he has been prevented from making up said final examination by entrance into the armed forces, or by military necessity.

DISCIPLINE

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

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 By authority of the Academic Senate, the President of the University is entrusted with the administration of student discipline with full power to act.

The President of the University customarily refers cases of student delinquency to the Men's and Women's Judiciary Committees of the Associated Students for recommendation. These committees are considered rather as household tribunals than as courts. Their inquiries and findings have not been given legal form, nor are the students summoned before the committees put under oath.

In respect to disciplinary action based on recommendations of one of the Student Judicial committees, the term "full censure" is sometimes used. "Full censure" carries with it suspension from all student activities, while "censure" does not.

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 it rains approximately one day out of three. 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 electric car to the University; about thirty-five minutes from San Francisco 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 expenditures. In a student body of several 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 \$27.50 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 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 withdraws from the University within the first four weeks from the date of his registration, 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 \$150.¹ 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. For students registering in more than one professional course in law in the School of Jurisprudence, an incidental fee of \$60 a semester is payable at the time of registration. This fee includes the regular University incidental fee of \$27.50 and the special Jurisprudence incidental fee of \$32.50. Nonresidents of California enrolled in the School of Jurisprudence pay a fee of \$210² 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 intrants 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 resident students is \$100 a semester; for nonresidents \$175.³

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.

¹ Formerly \$75. (The increase will not apply to students who were in attendance throughout the Spring Term, 1944, so long as they continue attendance upon subsequent semesters without interruption.)

² Formerly \$122.50. (The increase will not apply to students who were in attendance throughout the Spring Term, 1944, so long as they continue attendance upon subsequent semesters without interruption.)

³ Formerly \$110. (The increase will not apply to students who were in attendance throughout the Spring Term, 1944, so long as they continue attendance upon subsequent semesters without interruption.)

Laboratory fees. Laboratory charges, apportioned on the basis of materials used and for certain costs involved in the maintenance and operation of laboratory equipment, differ with the individual student's course, the range of fees in the elementary laboratories being from \$1.50 to \$34.50 a semester. The fees are stated in the descriptions of the several courses in this catalogue.

Students in the College of Engineering pay uniform service fees of \$20 a semester, which cover all required courses in the engineering curricula and all elective courses in the engineering department. Students registered for 8 units or less pay uniform service fees of \$15 a semester. Students in other colleges who elect laboratory courses offered in the engineering department pay labo-

PRINCIPAL ITEMS OF EXPENSE ESTIMATED FOR THE
FALL AND SPRING SEMESTERS

Expense Items	Minimum		Moderate		Liberal	
	Men	Women	Men	Women	Men	Women
Incidental Fee.....	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00
Books and Supplies.....	25.00	25.00	43.00	43.00	63.00	63.00
A.S.U.C. Membership.....	12.50	12.50	12.50	12.50	12.50	12.50
Board and Room.....	285.00	315.00	392.00	450.00	500.00	585.00
Miscellaneous (Recreation, club dues, laundry, drugs, etc.)....	30.00	46.00	80.00	130.00	206.00	286.00
Total.....	\$407.50	\$453.50	\$582.50	\$690.50	\$836.50	\$1001.50

ratory charges apportioned on the basis of materials actually used. These charges differ in the various courses (see the CIRCULAR OF STUDENT FEES AND DEPOSITS).

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 \$10 for the Course in Subject A (see page 36). 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 \$12.50 each year (fall and spring semesters), and though membership is not obligatory, it is advisable. A membership card entitles the holder to a subscription to the student newspaper, the *Daily Californian*; membership in the Henry Morse

Stephens Memorial Student Union, which is the center of campus life; privilege of admission free or at reduced rates to athletic contests; and participation in all student affairs, including 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 \$150¹ 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. When the University is not in regular session, the Attorney may be consulted or communications

¹ Formerly \$75. (The increase will not apply to students who were in attendance throughout the Spring Term, 1944, so long as they continue attendance upon subsequent semesters without interruption.)

may be addressed to him at Room 910, Crocker Building, San Francisco 4, California. At other times he, or his deputy, will keep office hours in Room 130, Administration Building, on the campus at Berkeley.

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 concerning student fees and deposits, which may be obtained from the Registrar, University of California, Berkeley 4.

Rules Governing Residence

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

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

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

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

Every person who has been, or who shall hereafter be classified as a 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, Education (Teacher-Training and the Ed.D. degree), Business Administration, Librarianship, Social Welfare, Hospital Dietetics, and except in the case of foreign students whose tuition is paid by their governments], who have proved that they are distinguished scholars and who are carrying full programs of work toward the fulfillment of requirements for academic higher degrees. No graduate student in full graduate standing, no matter how distinguished his scholarship may have been, will be exempted from the payment of the tuition fee if he is merely carrying some lower division or other courses for his cultural advancement.

The term *distinguished scholarship* in connection with the question of exemption from the payment of the tuition fee is interpreted as follows: The scholarship standing must have been excellent throughout a period of no less than two years just preceding the time of application for this privilege. Moreover, only students from institutions of high standing in scholarly work will be considered. Applicants for this privilege will be required to have sent to the Dean of the Graduate Division confidential letters about themselves from persons who are thoroughly acquainted with their personalities and their intellectual achievements. It should be clear from these statements, therefore, that only the decidedly exceptional student will be eligible for the privilege of exemption from the payment of tuition if he is a nonresident. Students exempted from the tuition fee pay only the incidental fee.

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

LIVING ACCOMMODATIONS

Lists of approved boarding and lodging houses for women, information about men's accommodations, fraternities, sororities and clubs, and advice and information about other types of accommodations may be obtained from the Dean of Students and the Dean of Women, 201 Administration Building. 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 the estimated cost is between \$45 and \$55 for men, and \$37.50 and \$60 a month for women. In the majority of the boarding houses for women the cost includes lodging and two meals per day. In the men's coöperative houses the cost is approximately \$32.50 a month, and in the women's coöperative houses between \$30 and \$35 a month. Monthly bills in sorority and fraternity houses, and in clubhouses range from \$52.50 to \$65 exclusive of initiation and pledge fees. These prices ordinarily include dues, lodging and three meals per day. Apartments vary greatly in price depending on size and location, but during the war period they have been difficult, if not impossible, to obtain. This situation still prevails.

Whatever type of lodgings the student engages he is urged at the time of making his reservation to have a clear understanding in writing with the proprietor regarding terms of payment, charges, if any, for the vacation periods, laundry privileges, the use of baths, etc.

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 under 21 years of age must have the written endorsement of the Dean of Women for her college residence before she will be permitted to file her study list. Approval is given to women students living with their parents, to those living in houses approved by the University, and to those living in sororities and student clubs. 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 blue residence and vocational 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 such houses is published annually. Proprietors of these approved houses expect students to remain throughout an entire semester and usually require a written contract to this effect. Reservations must be made with the person whose name appears on the list as manager.

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 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 houses are approved by the University. Membership in these organizations is by invitation, and women students who are interested in membership in a sorority may obtain information from the Dean of Women. Temporary accommodations are usually not available in boarding and lodging houses; therefore, 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 dormitories for women, except for Stern Hall, will be open to women intending to participate in rushing, but they will be expected to remain for the entire semester and will be released only if the Office of the Dean of Women can replace them.

Stern Hall, a dormitory for women students, is a gift of Mrs. Sigmund Stern. It accommodates 90 women. The price for room and board is \$250 a semester. Application must be made to the Dean of Women at least four months in advance of prospective residence.

Bowles Hall, a dormitory 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 Dean of Students approximately four months in advance of prospective attendance. The charge for room and board is \$225 a semester.

Fernwald Dormitories are seven new dormitories for women. The price for room and board, with three students in a room, is \$225 a semester. Application should be made to the office of the Dean of Women.

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.

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

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 coördination, under one executive officer, of the teacher placement activities on the Berkeley, Los Angeles, and Santa Barbara campuses. In addition, the Manager of the Bureau is available to students who wish advice in regard to choosing an occupation; books and pamphlets may be consulted at 102 Administration Building.

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 coöperation 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.

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. Students who are partly or wholly self-supporting and who maintain an excellent scholarship standing, are eligible to make application. Holders of undergraduate scholarships must carry a minimum of twelve 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.

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

the Graduate Division not later than February 20, prior to the academic year in which the award is tenable.

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

Loans. The loan funds for both graduate and undergraduate students are administered by the Dean of Students and the Dean of Women. 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 can 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 whose instruction is realized mainly in its vocational application. 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, and optometry. 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 36.)

Military Science and Tactics, 8 units (men). (See page 38.)

(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 4 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 1A.

Astronomy 1A, 1B, 2A-2B*, 7A-7B.

Bacteriology 1, 2.

Botany 1A*, 1B*, 12, 15*, 16*.

Chemistry 1A*-1B*, 5*, 8.

Entomology 1*.

‡Geography 1.

Geology 1A, 1B, 2.

Paleontology 1.

Physics 1A-1B*, 1C-1D*, 2A-2B, 3A-3B*, 10.

Physiology 1A, 1C*.

Zoölogy 1A*, 1B*, 10.

* Will be accepted as a laboratory course.

† For information concerning exemption from these requirements, apply to the Registrar.

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

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, Public Speaking.
- (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 (Art, Architecture, 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 Public Speaking

English 1A-1B; Public Speaking 1A-1B.

Group 2—Foreign Languages

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

French: 1, 2, 3, 4, 8, 25, or any upper division year sequence.

German: 1, 2, 3, 4, 3S-4S, 4M, 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: 1A-1B, 9A-9B.

Portuguese: 1A, 1B, 121, 122, 123A-123B.

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

Spanish: Any two consecutive courses of 1, 2, 3, 4, 25A, 25B, or any upper division year sequence.

Group 3—Mathematics

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

*Undergraduate Departments**Group 4—Social Sciences*

- *Anthropology 1A-1B.
- Economics 1A-1B.
- *Geography 1-2.
- History 4A-4B.
- History 8A-8B.
- History 17A-17B.
- Near Eastern Languages 13A-13B.
- Oriental Languages 42.
- Political Science 1, 2.
- Psychology 1A and 1B or 2.
- Social Institutions 1A-1B.

Group 5—Philosophy

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

Group 6—Fine Arts and Literature

- Architecture 5A, 5B, 5C.
- Art 1A, 1B, or 1C.
- Classics 35, 36.
- English 30, 44A, 44B, 46A, 46B.
- French 9A, 9B.
- German 9A, 9B.
- †Music 27A, 27B, 27C, 27E.
- Music 30A, 30B.
- Public Speaking 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.

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

† Music 110 and either Music 27A, 27B, 27C or 27E, will be accepted in satisfaction of requirement (e), group 6 for this year.

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 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 81). 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 degree of A.B. Students may complete this requirement by passing separate examinations in American institutions and in American history, for which no unit credit will be assigned, or by completing certain courses; or by a combination of both; or by presentation of a certificate of completion of acceptable courses at another collegiate institution (see American History and Institutions, page 37).

5. *At least 36 units of work chosen from the upper division courses named in the Letters and Science list* (see page 81), 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, or XL (with approval of department concerned). See, however, paragraph 7, page 68.

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 39-40.

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 catalogue. Descriptions of the group majors follow the list hereunder.

- | | |
|--|---|
| American Civilization | Geological Sciences |
| American Literature | Geophysics. See Geological Sciences |
| Animal Biology and Nutrition. See
Biochemistry | German |
| Anthropology | Greek. See Classics |
| Art. | History |
| Astronomy | Immunology. See Bacteriology |
| Astrophysics. See Astronomy | International Relations |
| Bacterial Metabolism. See Bacteri-
ology, also Biochemistry | Italian |
| Bacteriology | Japanese. See Oriental Languages |
| Biochemistry | Journalism |
| Botany | Jurisprudence |
| Chemistry | Latin. See Classics |
| Child Development | Linguistics. See Classics |
| Chinese. See Oriental Languages | Mathematics |
| Classics | Medical Sciences |
| Comparative Philology. See Classics | Microbiology, Technical. See Bacte-
riology |
| Criminology | Mineralogy. See Geological Sciences |
| Decorative Art | Music |
| Dramatic Art | Near Eastern Languages |
| Dramatic Literature | Oriental Languages |
| Economics | Paleobotany. See Paleontology |
| Education | Paleontology |
| English | Parasitology and General Biology.
See Bacteriology |
| Far Eastern Studies | Petrology. See Geological Sciences |
| French | Philosophy |
| Geography | Physical Education |

Physics	Religion
Physiology	Sanskrit. See Classics
Plant Physiology and Nutrition. See Biochemistry	Sculpture
Political Science	Seismology. See Geological Sciences
Portuguese. See Spanish	Slavic Languages
Premedical Curriculum. See Medical Sciences	Social Institutions
Psychology	Social Sciences
Public Speaking	Social Welfare
Recreation	Sociology
Regional Group Majors	Spanish
	Wildlife Conservation
	Zoology

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. G. E. MARSH.

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

The Major.—Twenty-four units, of which twenty-one 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 twenty-four units.

AMERICAN LITERATURE

Group Major Adviser: Miss MILES.

Preparation for the Major.—English 1A-1B, 30, 46A. Recommended as preparation: History 17A-17B.

The Major.—Required: 24 units of work distributed as follows: English 130A, 130B, 130C (6 units). 16 units in literature, to be arranged in consultation with the adviser. Ordinarily 9-12 units of this work will be in the English department in courses concurrent in time with American literature, and 3-6 units in similar courses in other departments. Not more than 4 units should be in literature in translation.

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), Physiology 1A, Physiology 1C. Recommended: Psychology 1B or 2, Anthropology 1A, 1B, Economics 1A, 1B (required for students whose later specialization will be in family life), Zoology 10, Home Economics 10.

The Major.—Required: Psychology 112 (or Home Economics 132), Psychology 113, Psychology 162, Psychology 163, Home Economics 134, Psychology 102, Education 116, Public Health 121, Social Welfare 100. Recommended: Psychology 107 (for students preparing for child development research), Psychology 115, Psychology 160, Home Economics 103, Social Welfare 106.

CRIMINOLOGY

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

Technical Aspects

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

Group Major Adviser: Mr. KIRK.

Preparation for the Major.—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, 108 (5 units), 115; Political Science 167A-167B, 168A-168B; Psychology 168. Recommended: Anatomy 102; Anthropology 1A-1B, 150A-150B; Bacteriology 1, 4; Biochemistry 104, 107; Botany 1A-1B (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; Public Speaking 1A-1B, 110A-110B; Zoölogy 4, 114, 119A-119B.

Social Aspects

Group Major Adviser: Mr. KIRK.

Preparation for the Major.—Business Administration 6A-6B; Economics 1A-1B, 40; Psychology 1A; Zoölogy 1A or 10; Social Welfare 101A. Strongly recommended: Chemistry 1A-1B; Physics 2A-2B, 3A-3B; Psychology 1B, 3, 5; Public Speaking 1A-1B, 2A-2B. Also recommended: Anthropology 1A; Architecture 1; Journalism 20A-20B; Physiology 1A; Public Health 5A-5B, 21.

The Major.—Economics 180; Political Science 167A-167B, 168A-168B, 181; Psychology 160, 168; Social Welfare 105. Eight units selected from the following: Anthropology 150A-150B; Business Administration 120, 121, 125, 160A-160B; Economics 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, 149, 160, 180, 185; Public Health 164A-164B; Public Speaking 107A-107B, 110A-110B, 120; Social Welfare 100, 102, 108, 201, 110A-110B, 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 and six units from the following: Public Speaking 2A-2B; Dramatic Art 10A-10B.

The Major.—Thirty units, of which the comprehensive examination counts for three units. Required: English 114A-114B and one of the Shakespeare courses (English 117A-117B, 117E); Dramatic Art 157A-157B, 160A-160B; six units selected from English 153A-153B, Philosophy 136A-136B, Philosophy 146, Dramatic Art 130C-130D.

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, three units.

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

FAR EASTERN STUDIES

This major is intended for students who seek a more thorough knowledge of the Far East than can be obtained 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.

Adviser: MR. BOODBERG.

Preparation for the Major.—Required: at least two of the following: History 4A-4B, Economics 1A-1B, Political Science 1, 2, Geography 1-2, Anthropology 1A-1B. Strongly recommended: Oriental Languages 1A-1B, 17A-17B, 42; or 9A-9B, 17A-17B, 32; and Slavic Languages 1A-1B.

The Major.—Required: 24 units consisting of Geography 125A-125B, History 191A-191B, Political Science 138, 136, and Economics 190 (A or B) and Anthropology 101B or 147; and 12 units from the following: Anthropology 101B, 147; Botany 150; Economics 190 (A or B); History 193A-193B, 194A-194B, 149A-149B; Oriental Languages 172A; Political Science 135, 145; Slavic Languages 102A-102B.

INTERNATIONAL RELATIONS

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

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

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 inter-government 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.

The attention of the student is directed to the following courses as important in relation to certain general aspects of this field: Geography 143, Economics 197, Psychology 145A–145B, Anthropology 160. Others, related to regional aspects, are to be noted in the Departments of Anthropology, Economics, Geography, History, Oriental Languages, Slavic Languages.

JURISPRUDENCE

Prelegal Adviser: Mr. FERRIER.

War veterans who enter the School of Jurisprudence as seniors 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.

Since admission to the School of Jurisprudence is selective, it is advisable for such students to select an alternate major and to undertake programs in their lower division and junior years that will make it possible for them to complete such alternate major in the senior year if they are not admitted to the School of Jurisprudence. This may require the selection of courses, both in the lower division and the junior year, prerequisite to work in the alternative major.

It should be particularly noted that, except for war veterans, seniors are no longer being admitted to the School. 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.* 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 gener-

ally 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. 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 Aptitude Test of the Association of American Medical Colleges. 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 complete his chosen major program in one year unless he has already partly fulfilled its requirements before entering the senior year. It is therefore desirable that each premedical student should plan his program with this contingency in mind, and undertake in his junior year the part of the major program of his alternative choice that will make it possible for him to complete the program for the A.B. degree in one year if he is not admitted to the Medical School. This can be done without in any way interfering with the completion of the premedical requirements.

An applicant for admission to the Medical School who in any year is unsuccessful in gaining admission to the School on account of an inferior scholarship record, may at once 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 Public Speaking 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.

Undergraduate Departments

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. C. A. NOBLE, JR., Mr. L. L. BENNETT, Mr. COPP, Mr. REINHARDT.

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. Following is a suggested program:

<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 and American History and Institutions* . . . . .		..	Military Science	2	2
Military Science	2	2	Zoölogy 1A-1B	4	4
Chemistry 1A-1B	5	5	Zoölogy 4	2	2
†English 1A-1B or Public Speaking 1A-1B.	3	3	‡Foreign Language	4	4
‡Foreign Language	4	4	Year Course (See requirement (e) for degree of Associate in Arts)	3	3
Electives as necessary to make up units.		3	Year Course (See requirement (e) for degree of Associate in Arts)	3	3
			Electives	1	..
	<hr/>	<hr/>		<hr/>	<hr/>
	14	17		17	18
<i>Third Year</i>					
			<i>Fall</i> Units	<i>Spring</i> Units	
Physics 2A-2B			3	3	
Physics 3A-3B			1	1	
†Chemistry 5			3	or 3	
‡Chemistry 8			3	or 3	
Zoölogy 100			3	..	
Electives			2 or 8	5 or 11	
			<hr/>	<hr/>	
			15	15	

* For regulations concerning Subject A see page 36; American History and Institutions, page 37.

† English: any 3 units in composition plus any 3 units in English literature will satisfy this requirement. Public Speaking 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 public speaking) 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 public speaking).

‡ Foreign Language: the Medical School requirement is 10 units of credit in a modern

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 COBB, Miss COLEMAN, Miss ESPENSCHADE; for men: Mr. HENRY, Mr. COZENS.

Preparation for the Group Major.—High school chemistry or the equivalent, Public Health 5A (3), Physiology 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); the Fundamentals of Rhythmic Movement (Physical Education 1 or 26) ($\frac{1}{2}$); Rhythmic Basis of Dance and Allied Arts (Physical Education 35) (2) women; Introduction to Physical Education (Physical Education 20) (1); and First Aid (Physical Education 5A) ($\frac{1}{2}$).

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).

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 20 or 135, Philosophy 6A, either Economics 1A-1B or Political Science 1, 2, 4 units of specified activity courses

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.

in Physical Education, 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.

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 immediate tasks connected with military operations and occupations and for later 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.—Recommended: Economics 1A–1B, Geography 1–2, History 4A–4B, Political Science 1, 2. Study of the Chinese language begun in the lower division.

The Major.—Required: One year of intensive training in Chinese leading to proficiency equal to reading a newspaper. Geography 125A, History 191A–191B, Political Science 135, 136, 138. Recommended: Anthropology 147; Economics 190A–190B; Geography 125B, 143; History 149A–149B; Oriental Languages 42.

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, 129, 185.

Regional Group Major on Germany and Central Europe

Advisers: Mr. KERNER, Mr. SONTAG.

Preparation for the Major.—Required: 16 units of German. (Minor shortages may be made up in the upper division); Anthropology 1A–1B; 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 112A; 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 1A-1B; Economics 1A-1B; Geography 1-2; History 4A-4B.

The Major.—Required: Spanish 104A-104B or Portuguese 121 and 123, and 9 units from Geography 122A-122B, Political Science 148A-148B, and Anthropology 141 or 142; History 161A-161B, 166A-166B. Recommended: Spanish 100B; Portuguese 131; Anthropology 123; Economics 190A-190B; Education 105; History 160A-160B, 181A-181B, 183.

Regional Group Major on Japan

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

Preparation for the Major.—Recommended: Economics 1A-1B, Geography 1-2, History 4A-4B, Political Science 1, 2. Study of the Japanese language begun in the lower division.

The Major.—Required: One year of intensive training in Japanese leading to proficiency equal to reading a newspaper. Geography 125B, History 191A-191B, Political Science 136, 138, 145. Recommended: Anthropology 147; Economics 190A-190B; Geography 125A, 143; History 149A-149B.

Regional Group Major on Russia and Eastern Europe

Advisers: Mr. MASLENIKOV, Mr. KERNER.

Preparation for the Major.—Required: Slavic Languages 1, 2. Recommended: Economics 1A-1B; History 4A-4B; Political Science 1, 2.

The Major.—Required: Slavic Languages 102A-102B, 103A-103B, Geography 123B; History 149A-149B. Recommended: Slavic Languages 18A-18B, 130, 131, 180; History 147A-147B; Economics 117A-117B; Geography 125A-125B.

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 pages 61, 67).

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; Near Eastern Languages 13A-13B, 102A-102B; Philosophy 104, 112.

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), Architecture 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; Anthropology 126; Classics 170A.

SOCIAL SCIENCES

This is a new group major for which the Upper Division requirements have not yet been formulated. The preparation for the group major is as follows: History 4A-4B, Economics 1A-1B, Political Science 1, 2, Geography 1, 2, Zoology 10, and either English 1A-1B or Public Speaking 1A-1B. For information, consult the Dean of the College of Letters and Science.

SOCIAL WELFARE

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

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 social insurance administration, employment service, farm security administration, or other branches of the social services for which graduate training in social work is not now 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: thirty-six units of upper division work, including (a) the following courses, to the value of thirteen units: Social Welfare 102, 104, 105, 110A-110B; (b) the following courses, to the value of twenty-three units, provided that not more than twelve units of upper division courses be substituted with the approval of the faculty adviser: 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.

SOCIOLOGY

Group Major Adviser: Mrs. THOMAS.

Committee in Charge of the Major: Mrs. THOMAS, Mr. H. E. JONES, Mr. LOWIE.

Preparation for the Major.—Economics 1A-1B; Anthropology 1A-1B; Social Institutions 1A-1B; Economics 40 (or its equivalent in some other department); History 4A-4B or 17A-17B.

The Major.—The program for the major should be planned in consultation with the committee in charge. The following courses are suggested: Anthropology 160; Economics 112, 113; Agricultural Economics 112, 113; Social Institutions 101A-101B, 121A-121B; Psychology 145A-145B; History 174A-174B.

WILDLIFE CONSERVATION

Group Major Adviser: Mr. EAKIN (fall semester); Mr. LEOPOLD (spring semester).

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, and 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, 12; Botany 1A or 12, 1B; Zoölogy 1A-1B; Entomology 1; Geography 1; Engineering 1A. Recommended: Economics 1A-1B; Geology 1A; Geography 4.

The Major.—Required: Botany 110A-110B; Zoölogy 106, 111 or 140, 113, 116; Forestry 101, 102, 103, 104, 123, 125; Entomology 127 or Zoölogy 125; Poultry Husbandry 106. Recommended: Geography 111.

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.

* This list refers to the courses as given in this catalogue, beginning on page 145.

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, 112, 113.
 Anatomy. All undergraduate courses.
 Anthropology. All undergraduate courses.
 Architecture 5A, 5B, 5C, 14, 113, 114, 117A-117B, 120A-120B.
 Art. All undergraduate courses.
 Astronomy. All undergraduate courses except 3 and 114.
 Bacteriology. All undergraduate courses.
 Biochemistry. All undergraduate courses.
 Botany. All undergraduate courses.
 Business Administration 10.
 Chemistry. All undergraduate courses except 144, 145A-145B, 146A-146B.
 Classics. All undergraduate courses.
 Decorative Art. All undergraduate courses.
 Dramatic Art. All undergraduate courses except 20, 190, 191, 192, 193.
 Economics. All undergraduate courses.
 Education 110 and not more than 3 units from 101, 102, 105.
 English. All undergraduate courses
 Entomology 1, 106, 112, 127.
 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, 141, 142, 144, 190.
 Italian. All undergraduate courses.
 Journalism 20A-20B, 140, 141, 190.
 Latin. All undergraduate courses.
 Mathematics. All undergraduate courses except 107.
 Medico-Military Science and Tactics 121A-121B.
 Military Science and Tactics. All undergraduate courses except 100A-100B.
 Music. All undergraduate courses; a total of not more than eight units from the following courses will be accepted as Letters and Science credit: 15, 25, 125, 155.
 Naval Science and Tactics. All undergraduate courses.
 Near Eastern Languages. All undergraduate courses.
 Oriental Languages. All undergraduate courses.
 Paleontology. All undergraduate courses.
 Philosophy. All undergraduate courses.
 Physics. All undergraduate courses.
 Physiology. All undergraduate courses except 115.
 Plant Pathology 121.
 Political Science. All undergraduate courses except 167A-167B, 168A-168B, 183.
 Psychology. All undergraduate courses except 3, 104, 116, 117, 185, 186.
 Public Health 5A-5B, 21, 163A, 163B.
 Public Speaking. All undergraduate courses.
 Sanskrit. All undergraduate courses.
 Scandinavian Languages. 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.

HONORS

Honors are granted only with the Bachelor's degree; honorable mention is given with the A.A.; and an honor list for upper division students is printed in normal times and published in the DIRECTORY OF STUDENTS.*

The honor list includes the names of:

- (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 not related to the field of the major, in which they will be marked "passed" or "not passed." Units gained in

* Publication of this list has been temporarily discontinued.

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 note the requirements and recommendations for admission, as stated on pages 24-31. Intrants will be seriously handicapped in undertaking the lower division courses required in the various curricula of this College unless they have completed the following subjects in high school: algebraic theory, $\frac{1}{2}$ unit; trigonometry, $\frac{1}{2}$ unit; physics, 1 unit; chemistry, 1 unit; and in addition, for those proposing to major in landscape design or forestry, geometrical drawing, 1 unit. 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) than is here given is contained in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, which may be obtained on application to the Dean of the College of Agriculture, University of California, Berkeley 4, California.

Requirements for the Degree of Bachelor of Science

The candidate for the B.S. Degree in the College of Agriculture must complete the following requirements:

(1) The equivalent of four years of university residence. The senior year must be spent in the College of Agriculture at this University.

(2) One hundred and twenty-four semester units of university work, in addition to matriculation units and Subject A (see page 36). These 124 units must be chosen in accordance with the provisions set forth in the following pages. The student must also attain at least as many grade points as there are units of credit in all courses undertaken by him in the University of California. For further information concerning grade-point requirements, see page 41.

(3) Thirty-six of the 124 units must be in upper division courses (courses numbered 100-199). Not more than 4 units may be in lower division physical education courses.

(4) Nine units of mathematics, including trigonometry. Matriculation work may be offered toward this requirement, with each year of high school work valued at 3 units. The student normally satisfies this requirement before the end of his sophomore year.

(5) American History and Institutions. The student may meet this requirement by passing separate examinations in American institutions and in American history, for which no unit credit is given, or by completing certain courses; or by a combination of both; or by presentation of a certificate of completion of acceptable courses at another collegiate institution (see American History and Institutions, page 37).

(6) The program of study listed under one of the following curricula, in addition to the mathematics requirement stated under (4) above:

*Undergraduate Departments**Required:*

(a)

CURRICULUM IN PLANT SCIENCE

Chemistry	16 units
Botany and Plant Physiology.....	12
English or Public Speaking.....	3
Physics	6
Bacteriology	4
Economics	3
Genetics	4
Soils and/or Irrigation.....	6
Plant Pathology	4
Entomology	4
Zoölogy	3
Military Science.....	8

 73 units

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

The plant science curriculum with a major in horticulture is 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.

(a) The summer practice course of six weeks also may be prescribed as a major division requirement.

Required:

(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

 75 units

(b) A minimum of 12 units of upper division work in one of the following majors, with the approval of the major adviser: animal husbandry, poultry husbandry, dairy industry, veterinary science, and genetics.

Required: CURRICULUM IN ENTOMOLOGY AND PARASITOLOGY

(a)	Chemistry	13 units
	Agriculture or Forestry, other than Entomology and Parasitology	12
	Botany and Zoölogy.....	20
	Bacteriology	4
	English or Public Speaking.....	6
	Genetics	3
	Physics	3
	Plant or Animal Pathology	6
	Plant or Animal Nutrition	4
	Plant or Animal Physiology	4
	Military Science.....	8
		<hr/>
		83 units

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

(c) At least 19 units in entomology and parasitology courses in addition to course 49. Courses 1, 106, 112, and 127 should be included.

Required: CURRICULUM IN AGRICULTURAL ECONOMICS

(a)	Botany, Bacteriology, Chemistry, Geology, Physics, Physiology, Zoölogy or additional Mathematics.....	18 units
	Mathematics	6
	English or Public Speaking.....	6
	Business Administration or Economics.....	15
	Anthropology, Geography, History, Philosophy, Political Science, Psychology, or Sociology and Social Institutions..	12
	Agriculture	15
	Military Science.....	8
		<hr/>
		80 units

(b) At least 15 units of work in upper division agricultural economics. For details of program, see page 91.

Required: CURRICULUM IN FORESTRY

(a)	Botany, including Plant Physiology with laboratory.....	10 units
	Chemistry, including Organic Chemistry	8
	Engineering (Surveying)	6
	Economics or Business Administration (other than Statistics) ..	9
	Geology	3
	Mathematics (Analytic Geometry and Calculus).....	6
	Physics (including laboratory).....	8
	Statistics	3
	Plant Pathology or Taxonomic Botany.....	3
	Public Speaking or English.....	6
	Soil Science.....	4
	Zoölogy, upper division, or Entomology.....	3
	Zoölogy, lower division.....	3
	Military Science.....	8
		<hr/>
		80 units

Undergraduate Departments

(b) The summer course in forestry, 105A-105B.

(c) At least 30 units of forestry other than the summer course, with the approval of the major adviser. Courses 100, 103, 104, 108, 110, 120, and 128 should be included.

For details and example of program, see page 91.

Required:

CURRICULUM IN SOIL SCIENCE

(a)

Chemistry	19 units
Physics (including laboratory)	8
Botany (including Plant Physiology)	12
Bacteriology	4
Mineralogy	3
Economics	6
Geology	3
Military Science	8

 63 units

(b) At least 24 units in soil science, selected with the approval of a major adviser. Courses 100, 101, 110, and 111 should be included.

(c) A summer field course (6 units; numbered 105) also may be prescribed as a major requirement.

Required:

CURRICULUM IN HOME ECONOMICS

(a)

Chemistry	5 units
Economics	6
Psychology	3
Bacteriology	4
Public Health and Physiology	6
English, History, or Public Speaking	6

 30 units

Other lower division requirements for the General Home Economics major are: Home Economics 1A-1B, 5, 7; Decorative Art 16A-16B, and Economics 40 or Psychology 5; Chemistry 8.

(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. The following upper division courses should be included:

General Home Economics Major:

Home Economics 140, 141 (or 142), 162, 167, 132 (or Psychology 112), 133, 144, 102A-102B; Decorative Art 130A; Civil Engineering 125.

Nutrition and Dietetics Major:

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

Food Chemistry and Technology Major:

Home Economics 100, 101A, 101B (or 125), 120A, 120B, 141 (or Agricultural Economics 101A or Business Administration 123), 106; Biochemistry 103; 4 units of Food Technology courses.

Household Economics Major:

Home Economics 100, 140, 141, 142, 144 and 162; 9 units of economics selected upon consultation with adviser.

Clothing and Textiles Major: Consult the major adviser.*Child Development Major:*

Home Economics 132 (or Psychology 112), 133, 134, 135, 435, 102A, 102B; Psychology 160, 162.

Required:

CURRICULUM IN LANDSCAPE DESIGN

(a)		
	Botany	4 or 8 units
	English or Public Speaking.....	6
	Art and Architecture.....	27
	Economics	6
	Engineering (Surveying)	3
	Sociology and Social Institutions, History, Philosophy, or Political Science	6
	Civil Engineering (other than Surveying), Geology, Mathe- matics, or Agriculture (other than Landscape Design).....	6
	Military Science.....	8

66 or 70 units

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

(c) At least 30 units of courses in the Division of Landscape Design in addition to course 49.

*Required:*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
	Zoology	5
	Military Science.....	8

60 units

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

The CURRICULUM IN AGRICULTURAL ENGINEERING is offered in the College of Engineering. See page 102.

Freshman and Sophomore Years

The programs of study outlined below normally are followed in the freshman and sophomore years in each of the agricultural curricula. Examples of programs at Berkeley only are given. College requirements for graduation are the same whether the student registers at Berkeley, Davis, or Los Angeles, except

Undergraduate Departments

that 4 units of physical education are required as a condition of residence at Los Angeles. For further information, see the PROSPECTUS OF THE COLLEGE OF AGRICULTURE which may be obtained from the Dean of the College of Agriculture, University of California, Berkeley 4.

PLANT SCIENCE

<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
Botany 1A-1B	4	4	Chemistry 5, 8.....	3	3
Chemistry 1A-1B	5	5	Zoölogy 10	3	..
Physics 2A-2B	3	3	Bacteriology 2 .....	..	4
English or Public Speaking 3	..	..	Horticulture 1	3	..
			Economics 1A	3	..
			Truck Crops 1 .....	..	3
			Elective	4	5
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		18	17

ANIMAL SCIENCE

<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
Zoölogy 1A-1B	4	4	Chemistry 8	3	..
Chemistry 1A-1B	5	5	Bacteriology 2 .....	..	4
Soils or Geology	3	..	Economics 1A-1B	3	3
†Animal Husbandry 7 .....	..	3	Physics 2A-2B	3	3
†Animal Husbandry 8	2	..	Botany 1A	4	..
Elective	2	2	Poultry Husbandry 1	3	..
			Animal Husbandry .....	..	5
			Elective	2	1
	<hr/>	<hr/>		<hr/>	<hr/>
	18	18		18	18

ENTOMOLOGY AND PARASITOLOGY

<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-1B	5	5	Zoölogy 1A-1B	4	4
Botany 1A-1B	4	4	Entomology 1	4	..
English 1A-1B or Public			Chemistry 8 .....	..	3
Speaking 1A-1B	3	3	Physics 2A	3	..
Elective	3	3	Bacteriology 2 .....	..	4
			Truck Crops 1 .....	..	3
			Elective	4	1
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		17	17

† Students registered at Berkeley or Los Angeles should substitute courses from the sophomore year.

AGRICULTURAL ECONOMICS

<i>Freshman Year</i>		<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science	2	2	Military Science	2
Chemistry 1A, 8	5	3	Business Administration 6A-6B	3
Economics 1A-1B	3	3	Mathematics 4A-11B	3
English 1A-1B or Public Speaking 1A-1B	3	3	Economics 40	3
Zoölogy 10	3	..	Business Administration 18	3
Botany 12 . . . . .	..	4	Geology 1A	3
			Elective	3
	16	15		17

FORESTRY

<i>Freshman Year</i>		<i>Sophomore Year</i>		
Military Science	2	2	Military Science	2
Chemistry 1A, 8	5	3	Physics 2A-2B, 3A-3B	4
Botany 12 . . . . .	..	4	*Engineering 1A-1B	3
Public Speaking 1A-1B or English 1A-1B	3	3	Economics 1A-1B	3
Zoölogy 10	3	..	Geology 1A	3
Mathematics 3A-3B	3	3	Statistics	3
Physical Education	$\frac{1}{2}$	$\frac{1}{2}$	Physical Education	$\frac{1}{2}$
	16 $\frac{1}{2}$	15 $\frac{1}{2}$	Elective	3
				18 $\frac{1}{2}$

SOIL SCIENCE

<i>Freshman Year</i>		<i>Sophomore Year</i>		
Military Science	2	2	Military Science	2
Botany 1A-1B	4	4	Chemistry 5, 8	3
Chemistry 1A-1B	5	5	Economics 1A-1B	3
Physics 2A-2B	3	3	Geology 1A	3
Physics 3A-3B	1	1	Bacteriology 2	4
Elective	2	2	Mineralogy 4A	3
	17	17	Elective	4
				16

HOME ECONOMICS

<i>Freshman Year</i>		<i>Sophomore Year</i>		
Chemistry 1A, 8	5	3	Physiology 1A	3
History, English, or Public Speaking	3	3	Home Economics 1A-1B	3
Public Health 5A	3	..	Psychology 1A	3
Decorative Art 16A-16B	2	2	Economics 1A-1B	3
Bacteriology 2 . . . . .	..	4	Home Economics 5, 7	3
Elective	2	4	Economics 40 or Psychology 5	3
	15	16	Elective	4
				16

* Trigonometry and geometrical drawing are prerequisite to Engineering 1A-1B.

LANDSCAPE DESIGN

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Military Science	2	2	Military Science	2	2
Botany 12	4	4	Architecture 12	1	..
Art 2A-2B	2	2	Architecture 50 .....	..	2
English 1A-1B or Public Speaking 1A-1B.	3	3	Engineering 21 .....	..	3
Architecture 1, 2	3	3	Art 3A-3B	3	3
Economics 1A-1B	3	3	Landscape Design 1A-1B.	3	3
Elective	3	..	Landscape Design 2 .....	..	2
			History 4A or Philosophy 6A.....	3	..
			Elective	4	1
	<hr/>	<hr/>		<hr/>	<hr/>
	16	17		16	16

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 1A-1B	4	4	Economics 1A-1B	3	3
English 1A .....	..	3	Poultry Husbandry 1....	..	3
Agronomy 1	3	..	Zoölogy 1A-1B	4	4
Elective	3	3	Elective	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		14	17

Junior and Senior Years

The schedule for the junior and senior years is determined by the major subject requirements, as listed above, 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.

Study-List Limits

Regular students are limited to 18 units a semester. To this maximum may be added a lower division course in physical education of not more than $\frac{1}{2}$ unit.

Honors

Honorable mention with junior standing. Students who have completed 64 units of 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 ($3\frac{1}{2}$ units), German or French (2 units). It is recommended also that solid geometry ($\frac{1}{2}$ unit), geometrical drawing, and further work in German or French be included. Students 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 specific requirements (a), (b), (d), and 22 units of (c), 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 cooperation 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 term 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 Latimer, chairman of the Committee on Honors of the College of Chemistry, 110 Gilman 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, and 4A, 4B or 14A, 14B.
- (b) Physics 1A, 1B, 1C, 1D.
- (c) Chemistry 1A, 1B, 5, 8, 9, 100, 104 or 105, 110A-110B, 111, and at least 9 units chosen from the following list: 101, 102, 103, 114H, 120, 144, 180H. NOTE.—107 may be substituted for either 102 or 103.
- (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 take the following courses in the freshman year:

*Subject A (see page 36).

Military Science	4 units
Physics 1A-1B	6
Chemistry 1A-1B	10
Mathematics 3A-3B	6
German 1-2	8
	34 units

Sophomore year. In addition to military science, Mathematics 4A-4B or 14A-14B, and electives, the program for the sophomore year will include at least 18 units chosen from the following list: Physics 1C-1D; Chemistry 5, 8, 9, 100, 105, 110A. Sophomore students, ordinarily, will not be permitted to take Chemistry 100 and 105 simultaneously.

Electives. The choice of electives from departments not closely related to chemistry will be encouraged, but all electives should be chosen in accordance with some comprehensive plan, and each program must be approved by the study-lists officer of the College of Chemistry. If the student is preparing for research in the field of physical chemistry the program should include 20 to 30 upper division units in physics and mathematics. A course leading to research in organic chemistry should include work in biochemistry, bacteriology and physiology. Students in the upper division 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 Shutz, room 104 Gilman Hall. The following program is recommended for the Chemical Engineering Curriculum:

<i>Sophomore Year</i>		<i>Junior Year</i>			
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Chemistry 5, 9	3	3	Chemistry 110B, 111	3	3
Chemistry 8, 110A	3	3	Chemistry 100, 102 or 103	4	3
†Engineering 2, 6	3	3	Chemistry 107, 144	3	3
Mathematics 4A-4B	3	3	Chemistry 105 or 104 .....	..	3
Physics 1C-1D	3	3	‡Engineering elective	6	3
Military Science	2	2			
			<i>Senior Year</i>		
				<i>Fall Units</i>	<i>Spring Units</i>
			Chemistry 114H, 216 (or Mech. Eng. 105A-105B)	3	
			Chemistry 145A, 145B	2	2
			Chemistry 146A, 146B	3	3
			Chemistry 120 or 101	3	..
			Engineering elective	6	6
			Chemistry 180H or ‡Engineering elective .....	..	3

* For regulations concerning Subject A, see page 36.

† Geometrical drawing and solid geometry are prerequisite to Engineering 2.

‡ Suggested courses for engineering electives: Engineering 10A-10B, Mechanical Engineering 102A-102B, 103, 106, 151, 152A-152B, 154, Civil Engineering 108A-108B, Electrical Engineering 110A-110B.

COLLEGE OF DENTISTRY

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

Classes are admitted to the College of Dentistry once a year, in September. Applications must be filed not later than August 1. 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 of at least grade C, 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 36).

Military Science and Tactics (men)..... 8 units

(2) English or Public Speaking (1A–1B†)..... 6 units

(3) Science 28–32 units

(a) Chemistry

Inorganic (1A–1B) 10 units

Organic lecture (8) 3 units

Organic laboratory (9) or quantitative analysis (5) 3 units

(b) Physics with laboratory (2A–2B and 3A–3B or 1A–1B) 6–8 units

(c) Biology, including one full semester of vertebrate zoölogy, with laboratory (Zoölogy 1A–1B) 6–8 units

* The requirement of American History and Institutions is also prerequisite to the Bachelor's degree, page 37.

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

- (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:..15-18 units
- (a) Group I: 2 year-courses selected from Anthropology (1A-1B), Economics (1A-1B), History (4A-4B, 8A-8B, 17A-17B), Political Science (1, 2), Psychology (1A-2), Public Health (5A-5B), Social Institutions (1A-1B)..... 12 units
- (b) Group II: 1 year-course selected from Group IIA, or any combination of two semester courses from Group IIB.....3-6 units
- Group IIA: Any foreign language literature course 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).
- Group IIB: Architecture (5A, 5B, 5C, 14), Art (1B, 1C, 19), English (30), Music (27A, 27B, 27C, 27D, 27E), any two semesters of a foreign language, provided a minimum of 8 units have been completed in the same language.

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.

All students entering the College of Dentistry must have a scholarship average of at least grade C in all work of college level. Students who have attended the University of California must have at least a C average in work undertaken in the University.

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

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)-(8) listed below. Students planning to enter this curriculum should make this fact known at the time of their first registration. A special adviser for these students will hold office hours in 1557 Life Sciences Building throughout the semester. 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).

Undergraduate Departments

- (1) *General University Requirements:*
 Subject A (examination in English composition).
 American History and Institutions (required for the bachelor's degree).
 The examinations in American Institutions and in American History may be taken in the College of Dentistry, but it is preferable to satisfy the requirement in the pre dental program. See page 37).
- (2) English or Public Speaking 6 units
- (3) Chemistry (1A, 8*) 8 units
- (4) Bacteriology with laboratory (2) 4 units
- (5) Physiology with laboratory (1A, 1C) 5 units
- (6) Anatomy (102) 3 units
- (7) Six units in each of the following:
- (a) Psychology (1A, 2)
- (b) Home Economics (1A, 1B)
- (c) Public Health (5A, 5B)
- (d) Economics (1A, 1B; Economics 40, 3 units, may be substituted for 1A-1B, in which case an additional 3 units of electives will be required) 21-24 units
- (8) Electives 10-13 units

Information concerning the professional curricula leading to the degree of Bachelor of Science and Doctor of Dental Surgery in this College, will be found in the ANNOUNCEMENT OF THE COLLEGE OF DENTISTRY. Address the Dean of the College of Dentistry, University of California Medical Center, San Francisco 22, California.

COLLEGE OF ENGINEERING

Matriculation requirements. A statement concerning matriculation requirements will be found on pages 24-31. 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 29.

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. Beginning with the spring semester, 1947, admission to the College of Engineering will be based primarily on the results of an entrance examination. All persons applying for admission to the lower division must take the freshman examination. A junior examination is given to all students just prior to completion of the sophomore year. Admission to all upper division courses and continuation in the College of Engineering is based upon

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

the results of this examination. Each undergraduate student transferring to the College of Engineering at the junior level or higher must also take the junior examination. His admission to the College will be based on the examination. Places and times for the examinations may be obtained from the Dean of the College of Engineering.

Service charge. Students registered in the College of Engineering pay a uniform service charge of \$20 a semester, which covers all required courses of the engineering curricula and all elective courses in the Department of Engineering. Students registered for 8 units or less pay a uniform service charge of \$15 a semester.

Laboratory fees. Students registered in other colleges who elect courses in the Department of Engineering pay fees per course as announced.

Curricula in engineering. Students in the College of Engineering may elect any one of many curricula. All of the curricula are grouped under the nine main curricula in Agricultural Engineering, Civil Engineering, Economic Geology, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Metallurgy, Mining Engineering, and Petroleum 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 circular apply only to students who begin 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.

	Units		Units
<i>Agricultural Engineering:</i>	134	<i>Mechanical Engineering:</i>	131
Mechanics, Thermodynamics, Fluid		Mechanics, Thermodynamics, Fluid	
Mechanics	6	Mechanics, Strength of Materials	11
Irrigation, Soil Science, Agronomy	18	Mechanical Design and Manufac-	
Agricultural Machinery and Struc-		turing Processes	10
tures	17	Electrical Circuits and Machinery.	5
*Optional Subjects	18	*Optional Subjects	25
<i>Civil Engineering:</i>	136	<i>Metallurgy:</i>	134
Mechanics, Strength of Materials,		Chemistry	5
Thermodynamics, Fluid Mecha-		Metallurgy	18
ics	13	*Optional Subjects	31
Hydraulic, Structural, and Trans-		<i>Mining Engineering:</i>	134
portation Engineering	13	Chemistry	2
*Optional Subjects	30	Dynamics	3
<i>Economic Geology:</i>	136	Mineralogy and Geology	18
Chemistry	2	Mining	10
Dynamics	8	Metallurgy	5
Mineralogy, Geology, and Paleon-		Analysis of Ores	6
tology	34	*Optional Subjects	10
Surveying and Map Drawing	6	<i>Petroleum Engineering:</i>	134
*Optional Subjects	11	Chemistry	8
<i>Electrical Engineering:</i>	132	Mechanics, Thermodynamics, Fluid	
Mathematics	4	Mechanics	6
Mechanics, Thermodynamics, Fluid		Petroleum Technology and Econom-	
Mechanics, Strength of Materials	6	ics	16
Electrical Circuits and Machinery.	22	*Optional Subjects	24
*Optional Subjects	20		
<i>Industrial Engineering:</i>	134		
Mechanics, Thermodynamics, Fluid			
Mechanics, Strength of Materials	10		
Electrical Circuits and Machinery.	5		
Business Administration	15		
*Optional Subjects	24		

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:

* To be chosen from sequences of scientific and professional courses giving emphasis to a particular phase of a general field.

- (1) Satisfy the general University requirements:
 - (a) Military Science: See page 38. Eight units 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 36.
 - (c) American History and Institutions. See page 37.
 - (d) Residence during the senior year. See page 40.

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 41.

(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 102-111). 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.

(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: Twelve units of electives have been placed in each curriculum to provide for the study of nonengineering subjects of general interest. These twelve units of electives are to be chosen from the following groups:

1. English, Public Speaking.
2. Foreign Languages.

Undergraduate Departments

3. Business Administration, Economics, Political Science.
4. Anthropology, Social Institutions, Psychology.
5. Life Sciences.
6. Fine Arts and Philosophy.

The elective units must be chosen from two of the above groups. If the curriculum contains more than twelve elective units, the remainder may be chosen from any department of the University. Students in agricultural, industrial, and mechanical engineering must select three units from group 1, and the nine additional units from two of the above groups.

PROGRAM OF STUDY IN AGRICULTURAL ENGINEERING

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Mathematics 3A-3B	3	3	Mathematics 4A-4B	3	3
Physics 4A		4	Physics 4B-4C	4	4
Chemistry 1A, 8	5	3	Engineering 40A-41	2	4
Engineering 22, 23	2	2	Engineering 24	2	..
Engineering 1A		3	Engineering 35		3
§Military Science	2	2	‡Agr. Engineering 12		2
†Elective	3	..	§Military Science	2	2
			†Elective	3	..
	15	17			
Engin. 48 (recommended) 1		..		16	18
<i>Junior Year</i>			<i>Senior Year (at Davis)</i>		
Mech. Engineering 105A-			†Agr. Engineering 114	3	..
105B	3	3	†Agr. Engineering 113		4
Mech. Engineering 102B	3	..	†Agr. Engineering 115	3	..
Mech. Engineering 106 (or C.E. 107A)		4	†Agr. Engineering 130		1
Civil Engineering 108A	3	..	Mech. Engineering 151 (or Soil Science 110)	3	..
Civil Engineering 108F	1	..	Mech. Engineering 152		3
Elec. Engineering 100A-			||Irrigation 120	3	..
100B	3	3	||Soil Science 106		4
Elec. Engineering 104A-			Agronomy 1	3	..
104B	1	1	†Elective		3
Mech. Engineering 103	3	..			
Irrigation 103		2			
†Elective		3			
	17	16		15	15
** (Agr. Engineering 49) . . (6)			*Agr. Engineering 6 (recom- mended)		2

* 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.

† For rules concerning selection of electives, see pages 101, 102.

‡ These courses include engineering economics, but Agricultural Economics 118 is recommended in addition.

§ See page 38.

|| If Irrigation 120 is not given in the first semester, students should take Soil Science 110 the first semester which is an acceptable substitute for Soil Science 106.

** Agricultural Engineering 49 (6 units, taken at Davis), a summer course, required, consisting of a study of engineering problems on typical California farms.

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 Study-Lists Committee, to meet the needs of the student who is preparing for some special phase of Agricultural Engineering, such as rural electrification, pest control, and food processing.

Undergraduate Departments

PROGRAM OF STUDY IN CIVIL ENGINEERING

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall</i> Units	<i>Spring</i> Units		<i>Fall</i> Units	<i>Spring</i> Units
Mathematics 3A-3B	3	3	Mathematics 4A-4B	3	3
Physics 4A	4	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	3	..	Engineering 35	3	3
§Military Science	2	2	Engineering 8	2	2
			*Electives	2	..
			§Military Science	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	16	17		16	16
<i>Summer Session</i>					
Engin. 8 (Surveying Camp) (4)					
<i>Junior Year</i>			<i>Senior Year</i>		
Mech. Engineering 102B	3	3	Civil Eng. 107C-107D	3	3
Civil Eng. 108A-108B	3	2	Civil Engineering 113	2	..
Civil Engineering 107A	3	3	Civil Engineering 108C	1	..
Civil Engineering 110	3	..	Civil Engineering 114	3	3
Civil Engineering 102A	3	..	Civil Engineering 109A	2	..
Civil Engineering 108B	2	2	Civil Engineering 106	2	..
*Elective	3	..	Civil Engineering 161	2	2
			*Elective	2	..
**Options			**Options		
TRANSPORTATION			TRANSPORTATION		
Civil Engineering 102B	3	3	Civil Eng. 104A-104B	2	2
Civil Engineering 105	2	2	Astronomy 114	3	..
Astronomy 107	2	..	Civil Engineering 111A	2	2
Electrical Engineering 101	3	..	*Elective	3	3
*Elective	3	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	17	18		17	15
SANITARY AND MUNICIPAL			SANITARY AND MUNICIPAL		
Civil Engineering 111A	2	2	Civil Engineering 116	2	2
Civil Eng. 123A-123B	3	3	Civil Engineering 109B	2	2
Civil Engineering 125	2	..	Civil Engineering 111B	2	..
Bacteriology 2	4	4	Civil Engineering 126	2	2
			Irrigation 112	2	..
			*Elective	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	17	19		16	16

* For rules concerning selection of electives, see pages 101, 102.

§ See page 38.

** *Construction Option*: The GENERAL CATALOGUE of 1947-1948 will give details concerning this option. The lower division requirements will be the same as the lower division requirements for other Civil Engineering options. The upper division subjects will include the subjects required of all Civil Engineering students and in addition the following: principles of accounting, industrial organization, personnel management, engineering

IRRIGATION		IRRIGATION	
Irrigation 102A	2	Irrigation 102B	2
Irrigation 103	2	Irrigation 101	2
Electrical Engineering 101	3	Irrigation 112	2
*Elective	4	Irrigation 104	2
		Civil Engineering 111A...	2
		*Elective	2
	17		18
	16		16

PROGRAM OF STUDY IN ECONOMIC GEOLOGY

<i>Freshman Year</i>		<i>Sophomore Year</i>		
	Fall Units	Spring Units	Fall Units	
Mathematics 9A-9B	3	3	Geology 1B	3
Physics 4A	3	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
			†Elective	3
	15	16		18
				17
<i>Junior Year</i>		<i>Senior Year</i>		
Metallurgy 2A	3	..	Mech. Eng. 102B	3
Geology 102A-102B	2	2	Geology 116	2
Geology 103-108	4	2	Mech. Eng. 103	3
Geology 106	3	..	Chemistry 109	3
Engineering 35 .....	..	3	Civil Engineering 108A...	3
Mineralogy 103 .....	..	3	*Restricted Electives	6
Mining 113 .....	..	1	†Elective	6
Elec. Eng. 101 .....	..	3		
*Restricted Electives	3	..		
Elective .....	..	3		
	15	17		15
				17
<i>Summer Sessions</i>				
**Geology 118 .....	..	6		

economy, production management, contracts, specifications and engineering relations, commercial law, elementary structural design, electives.

** *Structural Option*: The GENERAL CATALOGUE of 1947-1948 will give details concerning this option. The lower division requirements will be the same as the lower division requirements for other Civil Engineering options. The upper division subjects will include the subjects required of all Civil Engineering students and in addition the following: elementary thermodynamics, structural drafting, elementary structural design, electricity, engineering economy, special problems, contracts, specifications and engineering relations, advanced structural analysis and design, soil and asphalt laboratory.

† For rules concerning the selection of electives see pages 101, 102.

* Options in mining geology and in petroleum geology may be arranged by the proper choice of restricted electives subject to the approval of the Committee on Study Lists. Lists of suggested courses for these options may be obtained from the faculty adviser or from the office of the Dean of the College.

** Geology 118, 6 units, is a summer course in advanced field work.

§ See page 38.

Undergraduate Departments

PROGRAM OF STUDY IN ELECTRICAL 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 3-4A	6	3	Mathematics 4B-110	3	4
Chemistry 1A-8	5	3	Physics 4B-4C	4	4
Physics 4A	2	4	Engineering 35	3	3
Engineering 22-23	2	2	Production Methods	4	..
‡Elective	3	3	‡Elective	3	3
§Military Science	2	2	§Military Science	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	15	17		16	16
<i>Junior Year</i>			<i>Senior Year</i>		
Elec. Eng. 110A-110B	3	3	Elec. Eng. 116A	3	..
Elec. Eng. 104A-104B	1	1	Elec. Eng. 113 . . . . .	..	2
Elec. Eng. 105-106	3	4	Elec. Eng. 111A	3	..
Mech. Eng. 105A-105B	3	3	Elec. Eng. 133	2	..
Mech. Eng. 107	3	3	Elec. Eng. 132A	2	..
Mech. Eng. 102B	3	3	*Economics . . . . .	..	3
Civil Engineering 108A	3	..	‡Elective . . . . .	..	3
Civil Engineering 108F	1	..	Restricted Electives	7	9
†English 106H	3	..			
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		17	17

NOTE.—Options in communications, industrial electronics and control, illumination, power systems, power machinery, power plants, and in other fields 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, physics, 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. This option 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 Study-Lists Committee 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.

‡ For rules concerning selection of electives, see pages 101, 102.

§ See page 38.

† Students not admitted to English 106H may substitute another course.

* Students may elect Mechanical Engineering 120 or Business Administration 107.

PROGRAM OF STUDY IN INDUSTRIAL 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>
Chemistry 1A	5	..	Physics 4B-4C	4	4
Chemistry 8 .....	..	3	Mathematics 4A-4B	3	3
Mathematics 3A-3B	3	3	Engineering 24	2	..
Physics 4A .....	..	4	Engineering 40	3	..
Engineering 22-23	2	2	Engineering 41 .....	..	4
Engineering 1A .....	..	3	Engineering 35 .....	..	3
*Engineering 48	1	..	Economics 40	3	..
† Elective	3	..	§ Military Science	2	2
§ Military Science	2	2			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	17		17	16
<i>Junior Year</i>			<i>Senior Year</i>		
Civil Engineering 108A... 3	..	..	Mech. Eng. 145..... 3	..	3
Civil Engineering 108F... 1	..	..	Mech. Eng. 107..... 3	..	..
Elec. Eng. 100A-100B... 3	3	3	Mech. Eng. 113..... 2	..	..
Elec. Eng. 104A-104B... 1	1	1	Mech. Eng. 120..... 3	..	3
Mech. Eng. 102B..... 3	..	..	Mech. Eng. 143..... 3	..	..
Mech. Eng. 103..... 3	3	3	Mech. Eng. 144..... 2	..	2
Mech. Eng. 105A-105B... 3	3	3	Bus. Administration 107.. 3	..	..
Mech. Eng. 106..... 4	4	4	Bus. Administration 120.. 3	..	3
Bus. Administration 6A-6B 3	3	3	Bus. Administration 127.. 3	..	..
			† Elective	3	6
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		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.

† For rules concerning selection of electives, see pages 101, 102.

§ See page 38.

* 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.

Undergraduate Departments

PROGRAM OF STUDY IN MECHANICAL 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-8	5	3	Physics 4B-4C	4	4
Engineering 1A	3	3	Engineering 24	2	..
Physics 4A . . . . .	..	4	Engineering 40-41	3	4
Engineering 22-23	2	2	Engineering 35 . . . . .	..	3
**Engineering 48	1	..	*Elective	3	..
*Elective	3	..	§Military Science	2	2
§Military Science	2	2			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	17		17	16
<i>Junior Year</i>			<i>Senior Year</i>		
Mech. Eng. 102B-106	3	4	Mech. Eng. 113	2	..
Mech. Eng. 103 . . . . .	..	3	Mech. Eng. 120 . . . . .	..	3
Mech. Eng. 105A-105B	3	3	Mech. Eng. 124A-124B	3	3
Elec. Eng. 100A-100B	3	3	Mech. Eng. 131A-131B	4	4
Elec. Eng. 104A-104B	1	1	†Restricted Electives	6	6
Civil Engineering 108A	3	..			
Civil Engineering 108F	1	..			
*Elective	3	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		15	16

† Options in air conditioning and refrigeration, automotive, chemical, fluid mechanics (hydraulics), heat power, heat transfer and thermodynamics, marine, mechanical design 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 these options may be obtained in Room 220, Engineering Building. A minimum of 5 units of approved senior courses in mechanical engineering must be included among the restricted electives.

** For rules concerning selection of electives, see pages 101, 102.

** 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.

§ See page 38.

PROGRAM OF STUDY IN METALLURGY

PHYSICAL METALLURGY			PROCESS METALLURGY		
<i>Freshman Year</i>					
	<i>Fall</i> Units	<i>Spring</i> Units		<i>Fall</i> Units	<i>Spring</i> Units
Chemistry 1A-1B	5	5	Mathematics 3A-3B	3	3
Mathematics 3A-3B	3	3	Physics 4A	4	4
Physics 4A	4	4	Chemistry 1A-1B	5	5
Engineering 22-23	2	2	Engineering 22-23	2	2
†Elective	3	..	Engineering 1A	3	..
‡Military Science	2	2	‡Military Science	2	2
	<hr/> 15	<hr/> 16		<hr/> 15	<hr/> 16
<i>Sophomore Year</i>					
Physics 4B-4C	4	4	Mathematics 4A-4B	3	3
Mathematics 4A-4B	3	3	Physics 4B-4C	4	4
Engineering 41	4	4	Metallurgy 2A-2B	3	3
Metallurgy 2A	3	..	Chemistry 110A	3	3
Engineering 35 (or Physics 105A)	3	3	Geology 1A	3	..
†Elective	3	..	Mineralogy 4A-4B	3	2
‡Military Science	2	2	‡Military Science	2	2
	<hr/> 15	<hr/> 16		<hr/> 18	<hr/> 17
<i>Junior Year</i>					
Chemistry 110A-110B ...	3	3	Engineering 35	3	3
Civil Eng. 108A-108F ...	3	1	Chemistry 110B	3	..
Mech. Eng. 102B or Physics 105B	3	..	Electrical Engineering 101 ..	3	3
Mech. 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	..
†Elective	3	3	Mining 113	3	1
*Restricted Electives	4	3	Metallurgy 108-106	3	2
	<hr/> 18	<hr/> 18	Metallurgy 150A-110A ...	3	2
			†Elective	3	3
				<hr/> 18	<hr/> 18
<i>Senior Year</i>					
Mech. Eng. 120 or Bus. Adm. 107	3	3	Mech. Eng. 120	3	3
Mech. Eng. 106 or Physics 121	4 or 3	..	Civil Engineering 110	3	..
Metallurgy 170A-170B ...	3	3	Civil Engineering 108A	3	3
Metallurgy 174	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	1	Metallurgy 110B	2	..
†Elective	3	..	*Restricted Electives	3	2
*Restricted Electives	6 or 7	5	†Elective	3	3
	<hr/> 18	<hr/> 18		<hr/> 18	<hr/> 14

† For rules concerning selection of electives, see pages 101, 102.

‡ See page 38.

* 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.

Undergraduate Departments

PROGRAM OF STUDY IN MINING ENGINEERING

<i>Freshman Year</i>		<i>Sophomore Year</i>			
	<i>Fall Units</i>	<i>Spring Units</i>			
Mathematics 3A-3B	3	3	Geology 1A	3	..
Physics 4A . . . . .	..	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	..	Mech. 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 109-107	2	3
Geology 106	3	..	*Elective . . . . .	..	6
Mech. Eng. 102B	3	..			
Mech. Eng. 105A	3	..			
Mining 1 . . . . .	..	3			
*Elective . . . . .	..	6			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	18		15	17

* For rules concerning selection of electives, see pages 101, 102.

§ See page 38.

PROGRAM OF STUDY IN PETROLEUM 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	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 Elective	3	2
			§Military Science	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	15	17		17	17
<i>Junior Year</i>			<i>Senior Year</i>		
Mech. Eng. 102B	3	..	Mech. Eng. 105A-105B	3	3
Mech. Eng. 103 . . . . .	..	3	Petrol. Eng. 121A-121B	3	3
Civil Engineering 108A	3	..	Petrol. Eng. 123A-123B	2	2
Electrical Engineering 101 . . . . .	..	3	Petrol. Eng. 127-125	2	3
Petrol. Eng. 117-119	2	2	†Restricted Electives	5	3
†Restricted Electives	7	6	*Elective	3	3
*Elective	3	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	18	17		18	17

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 a graduate adviser in the Department of Engineering, or the Dean of the School of Business Administration.

Honors

Honors in the Upper Division. The University publishes annually a list of honor students in the upper division.† In the College of Engineering the list includes the names of undergraduates in junior and senior standing who have maintained an average scholarship record of at least grade B.

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.

† 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)

* For rules concerning selection of electives, see pages 101, 102.

§ See page 38.

‡ Publication of this list has been temporarily discontinued.

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 Admission Committee. A personal interview will normally 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. The requirements for admission to the curriculum are the same as the requirements for admission to the academic departments of the University as stated on pages 24–31, herein. The minimum age at which applicants will be admitted to this College is sixteen years. It is recommended that applicants present credit in Subject A (English Composition); English, 3 units; history, 1 unit; mathematics (algebra and plane geometry), 2 or 2½ units; chemistry, 1 unit; physics, 1 unit, or mathematics (including trigonometry), 3 units; German or French, 2 units; Latin, 1 unit; 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)

	Fall Units	Spring Units
Zoölogy 1A-1B	4	4
Botany 12 (or equivalent) ¹.....	..	4
Chemistry 1A-1B	5	5
English 1A-1B or Public Speaking 1A-1B.....	3	3
Mathematics ²	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

To be admitted to the School of Architecture, students must have at least junior standing and must have satisfied the requirements for the degree of Associate in Arts in the College of Letters and Science at Berkeley or Los Angeles, or the equivalent. Students, in order to complete the work in the number of semesters indicated, should also have completed the prerequisites to the courses in the curriculum of the School.

Freshmen who plan to enter the School later should, upon entering the University, register in the College of Letters and Science where they will normally remain for two years. Successful completion of the curriculum given below will lead to the degree of Associate in Arts in the College of Letters and Science and satisfy the prerequisites for the courses in the curriculum of the School.

Advisers: Freshman and Sophomore Years: Mr. S. L. JORY, Mr. H. A. STUMP.
Junior, Senior, and Graduate Years: Mr. W. C. PERRY, Mr. R. W. JEANS.

* 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 Admission Committee. A personal interview will normally 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, the Medical Center, San Francisco 22, California.

¹ Botany 1A may be substituted for Botany 12.

² Students should have completed two years of algebra and one-half year of trigonometry in the 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 8A, 2 or 11A.

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	Fall Units	Spring Units		Fall Units	Spring Units
Subject A (see page 36)	0	..	Military Science	2	2
American History and In- stitutions (see page 37) 0	0	..	Mathematics 4A	3	..
Military Science	2	2	Engineering 18A . . . . .	..	3
⁵ Mathematics 3A-3B	3	3	² Architecture 5A-5B, 6A-6B	3	3
⁸ Physics 1A-1B	3	3	⁸ Year Course	3	3
or Physics 4A . . . . .	..	4	Architecture 3-4	3	4
¹ Foreign Language	4	4	Architecture 12	1	..
Architecture 1-2	3	3	Architecture 18B	1	..
Architecture 18A . . . . .	..	1	Architecture 13 . . . . .	..	1
Architecture 12 . . . . .	..	1			
Art 2A	2	..			
	<hr/> 15 or 17	<hr/> 17 or 18		<hr/> 16	<hr/> 16

Admission to the School is by formal application to the Faculty of the School. Students in attendance in Berkeley should file this application with the Secretary of the School at the time of filing notice of candidacy for the A.A. degree. Students who plan to enter the School directly from another institution may file application during their first registration period; such students will be expected to fulfill the requirements for the degree of Associate in Arts in the College of Letters and Science at as early a time as possible. Credit for architectural design or graphic art completed elsewhere will be allowed only on the basis of a representative showing of this work for evaluation by the Faculty of the School at the time of the student's first registration.

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).

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.)

* Students entering in the fall semester, 1946, may substitute Physics 4A (4), in the spring semester, for the year course, Physics 1A-1B. Thereafter, all students must take Physics 4A in preparation for Engineering 18A.

¹ 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 in the sophomore year.)

² See requirement (c), College of Letters and Science.

³ See requirement (e), College of Letters and Science.

The degree of Graduate in Architecture will be recommended for students in 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, including the thesis, and who have been duly advanced to candidacy.

PRESCRIBED CURRICULUM

<i>Junior Year</i>		<i>Senior Year</i>			
	<i>Fall Units</i>	<i>Spring Units</i>			
Engineering 21	3	3	Civil Engineering 107B- 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 50 .....	..	2	Architecture 112	1	..
Architecture 60 .....	..	1	Architecture 114	2	..
Architecture 12	1	..	Elective	3	3
Architecture 13	1	..			
Architecture 14 .....	..	2			
Architecture 115 .....	..	1			
Elective	6	..			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	16		16	16
		<i>First Graduate Year</i>		<i>Fall Units</i>	<i>Spring Units</i>
Architecture 200				5	..
Architecture 201A				1	..
Architecture 201B .....				..	7
Architecture 207				3	..
Architecture 208 .....				..	3
Architecture 209 .....				..	2
Elective				3	..
Comprehensive Final Examination .....				..	..
				<hr/>	<hr/>
				12	12
		<i>Second Graduate Year</i>			
Architecture 202				6	..
Electives .....				..	..
Thesis for the degree of Graduate in Architecture .....				..	..
				<hr/>	<hr/>
				6	..

For description of courses named above, see under Courses of Instruction, in later pages of this catalogue.

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.

Values. Progress from one stage of architectural design to the next is based on the acquisition in each stage of a certain number of "values." The medal of the School, without additional "values" may be granted for an especially good solution of a problem in design.

Thesis for the degree of Graduate in Architecture. This must be done under the supervision of the Dean of the School and the Staff, and 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 candidacy for the degree of Master of Business Administration.

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. Normally students will no doubt 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 both a broad knowledge of the background and chief functions of modern business enterprise, and 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 nine 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. Normally, 60 units of the 120 units must be completed after admission to the School unless advanced standing was granted for equivalent work taken elsewhere. 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 two 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 p. 117 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 (Industrial 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 Trade and Commercial Policies)	3 units

III. Concentration:

Nine units beyond the introductory course in one field..... 9 units

The following fields of concentration are approved: Accounting, Banking and Finance, Foreign Trade, Insurance, Marketing (including Advertising, Retailing, and Agricultural Marketing), Industrial Relations and Personnel Administration, Production Management and Control, Industrial Procurement, Transportation, 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, Psychology, Political Science, 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 graduates of state colleges 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 Public Speaking, or by any other test satisfactory to the committee.

Health Certificate. The student must submit to 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 and Institutions. A knowledge of the principles and provisions of the Constitution of the United States and of American history is required. The student may pass separate examinations in American institutions and American history for which no unit credit is given; complete certain courses; or take a combination of both; or present a certificate of completion of acceptable courses at another collegiate institution (see American History and Institutions, p. 37).

Approval of Schedules. As early as possible in his academic year, the student should consult Miss Murdock, Credentials Assistant, 107 Haviland Hall.

The graduate of another institution who wishes to become a 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.

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 \$2 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 pages 119-120.

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 1.00 the following 18 units in Education (the State Department of Education requires that at least six units in Education be completed in the graduate year):

History of Education—Education 101 or 102.....	3-2 units
Educational Psychology—Education 110.....	3
Secondary Education—Education 170.....	2
Growth and Development of the Child—Education 111.	2
Electives	2-3
Supervised Teaching—Education 320A	1
Education 320c	3
Professional Methods—Education 320E	2
Total.....	18 units

NOTE:—

- (a) Psychology 1A or its equivalent is prerequisite to these courses. The student is advised to distribute this work over the junior, senior, and graduate years.
- (b) 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 Public Speaking
- (5) Foreign Language (French or German or Italian or Latin or Spanish).
- (6) Home Making
- (7) Librarianship
- (8) Life Science
- (9) Mathematics
- (10) Music
- (11) Physical Education
- (12) Physical Science
- (13) Social Studies

* For requirements for the teaching majors and teaching minors consult the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

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 or departmental majors for the bachelor's degree). The second consists of a minimum of 36 units of upper division and/or graduate work in two or more related subjects (e.g., Social Studies), this major being fixed by the School of Education in consultation with the subject representatives of the departments concerned. In addition to the foregoing minimum requirements, the School of Education will prescribe such graduate courses designed for teachers as may be organized by the various departments; and, in agreement with the subject representative, such other courses, either graduate or undergraduate, as may be found necessary, provided the total number of units required for any subject does not exceed 36.

The Teaching Minor. The teaching minor in any subject consists of not less than 18 units, ordinarily in a department or field of studies other than the teaching major, and not less than 9 units of this total shall consist of upper division and/or graduate courses (except as recommended by the department or departments concerned to the School of Education).

4. He must maintain the following scholarship ratings in the various classifications of this work:

Upper division work	A grade-point average of at least 1.50.
Postgraduate work	A grade-point average of at least 1.75.
Education courses	A grade-point average of at least 1.00.
Work for the major	A grade-point average of at least 1.75.
Work for the minor	A grade-point average of at least 1.00.

The Junior College Credential

Requirements. The candidate for the recommendation for this credential must fulfill the specific requirements listed below, in addition to the general requirements described on pages 119, 120.

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.

† A combination teaching major and minor may be worked out in certain fields utilizing the basic courses as fundamental to both the teaching major and teaching minor.

3. He must complete a teaching minor in one of the above fields or in a field chosen from the list of teaching majors for the general secondary credential (page 121).

4. He must complete with a scholarship average not lower than 1.00 at least 10 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 324 and Education 320E, Section 16....	6
(b) All other students will take Education 320A, 320C, and 320E, Section 16.....	6
	10-11 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 pages 119, 120.

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 1.00 the following courses in Education:

For the General Elementary Credential:

Educational Psychology—Education 110.....	3 units
Elementary Education—Education 130.....	3 units
Psychology of Elementary School Subjects—Education 118	2 units
Special Problems of Teaching in Elementary Schools—	
Education 131	2 units
Reading and Literature in the Elementary School—	
Education 134	2 units
Social Studies in the Elementary School—Education 138...	2 units
Growth and Development of Children—Education 111.....	2 units
Supervised Teaching—Education 320A, C, and Education 321	6 units
Professional Methods Course—Education 320E, Sec. 15....	2 units

5. He must complete, with a scholarship average of at least 1.00, a major and minor in the following fields of university studies:

- | | |
|---------------------------------|------------------------|
| (a) Art | (f) Music |
| (b) English and Public Speaking | (g) Natural Science |
| (c) Foreign Language | (h) Physical Education |
| (d) Home Economics | (i) Social Studies |
| (e) Mathematics | |

A major for this credential consists of the 24-unit departmental major offered in satisfaction of requirements for the A.B. degree. In addition, the 36-unit general (nonmajor) curriculum offered in satisfaction of requirements for the A.B. degree may be offered in lieu of the departmental major provided certain requirements for this major are included in addition to the "36 upper division units named in the Letters and Science List and distributed through not more than three departments with a maximum of 30 units in any one department." The major for this credential must include at least 12 upper division units in one of the above fields of university studies and a total of 24 units in that field. A minor consists of 12 units, at least 6 of which are in upper division courses.

For the General Junior High 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 1.00:

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

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.

Details of graduation requirements and recommended programs of study will be published in a special Announcement of the School of Forestry.

SCHOOL OF JURISPRUDENCE

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. For exceptions made in the case of veteran applicants, see "Admission of Veterans."

Applicants for admission to the professional curriculum must also have pursued a program of prelegal study in substantial conformity with the essentials of a satisfactory prelegal education (see p. 73), and must have achieved a minimum grade-point average of 2.0 (B average) in the work of the last two prelegal years. See also "Admission by Examination." For exceptions made in the case of veteran applicants, see "Admission of Veterans."

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 may be admitted to the second year of the professional curriculum with credit for not more than one year of work in another law school 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 the 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.

All applicants for admission on the basis of the bachelor's degree are required to file an application with 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.* Applicants not enrolled at the University of California, Berkeley, must also submit transcripts of record. Applications should be filed at the earliest possible date in order to assure appraisal in advance of the opening of the Fall Semester.

Application forms and further information may be obtained by addressing the Secretary, School of Jurisprudence, University of California, Berkeley 4.

Admission by Examination

Applicants for admission to the professional curriculum of the School of Jurisprudence who meet all the requirements set forth above under "Admission to the Professional Curriculum," except the requirement of a B average, may qualify for admission by achieving satisfactory scores on the Graduate Record Examination and on prescribed Law Aptitude Tests. Students seeking to qualify for admission by this procedure should consult the Secretary of the School.

Admission of Veterans

Exceptions to the above requirements are made in the case of veteran applicants. For the purpose of these exceptions, the veteran applicant is defined as one who is eligible for and entitled to receive education or training as provided in Section 400 of the Servicemen's Readjustment Act of 1944 (Public Law 346, Seventh-eighth Congress) or who has been released from active duty with the armed forces of the United States under conditions other than dishonorable after not less than the period of service therein provided.

Exceptions made in the case of veteran applicants are as follows: (1) the veteran applicant who meets all the requirements set forth above under "Admission to the Professional Curriculum," except the requirement of an academic degree, may be admitted to the School if eligible for admission to senior standing in the University of California; (2) the veteran applicant who meets all the requirements thus set forth above, except the requirement of a B average, may qualify for admission if the record shows superior achievement in undergraduate studies and is confirmed by a satisfactory score in the Law Aptitude Tests; (3) the veteran applicant who meets all the requirements thus set forth above, except the requirement of an academic degree and the requirement of a B average, may qualify for admission if eligible for admission to senior standing in the University of California and if the record shows superior achievement in undergraduate studies and is confirmed by a satisfactory score in the Law Aptitude Tests.

Veteran applicants for admission on the basis of senior standing who are

* 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.

not enrolled in the University of California, Berkeley, must apply for admission to such standing through the office of the Director of Admissions, University of California, Berkeley 4. The application must be accompanied by a transcript of record and, in the case of applicants not enrolled in any division of the University, by a remittance in the sum of \$5 payable to The Regents of the University of California.

Veteran applicants who expect to qualify for admission by taking the Law Aptitude Tests should make application to the Secretary, School of Jurisprudence, University of California, Berkeley 4. There is no additional fee for these tests. Veteran applicants are not required to take the Graduate Record Examination.

Application forms and further information may be obtained by addressing the Secretary, School of Jurisprudence, University of California, Berkeley 4.

Admission to the Graduate Curriculum

The student who wishes to extend and deepen his knowledge of law or to prepare himself for legal research or law teaching may become a candidate for the degree of Master of Laws (LL.M.) or the degree of Doctor of the Science of Law (Juris Scientiae Doctor, J.S.D.).

Admission to the graduate curriculum leading to the degree of LL.M. may be granted to graduates of an approved college or university who also hold a professional degree from a law school approved by the American Bar Association and who, in the opinion of the faculty, give evidence of capacity to continue their studies in law with superior achievement.

Admission to the graduate curriculum leading to the degree of J.S.D. may be granted to graduates of an approved college or university who also hold a professional degree from a law school approved by the American Bar Association and who, in the opinion of the faculty, give evidence of ability to conduct with distinction a program of research in a selected field of the law.

If the previous training of an applicant for admission to the graduate curriculum has been received in foreign educational institutions, he must present evidence that his preparation is substantially equivalent to that required for graduation from an American college or university.

SCHOOL OF LIBRARIANSHIP

The School of Librarianship is organized to offer a two-year curriculum. To students completing the first year with an average grade of at least C, a certificate is issued. The degree of Master of Arts is granted to students who complete with an average grade of at least B the second-year curriculum.

The A.B. degree of the University of California or its equivalent, full graduate standing in the University, and a college year each of two modern languages is required for admission. German and French are particularly rec-

commended for those preparing for university library positions. Applicants for admission 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.

First-year curriculum. In order 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 advance 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 or to take courses other than those in the School. 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.

Second-year curriculum. 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 76).

All applicants for admission to the Medical School are required to take the Medical Aptitude Test of the Association of American Medical Colleges. This examination is given at various colleges and universities, including the University of California. The date upon which the examination is to be held in Berkeley will be announced later.

Applications for admission to the Medical School should be filed with the Director of Admissions, University of California, Berkeley 4. Applications for

the September, 1947, first-year class may be filed between November 1, 1946, and April 1, 1947. In the meantime, 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. Personal interviews are also held. In addition, as stated above, each applicant must take the Medical Aptitude Test.

The number of students who may be admitted to each first-year class from institutions outside the State of California is limited to five, and of these five not more than one will be selected from institutions of any one state. The Committee on Admissions has agreed to admit not more than three applicants from foreign countries and these will be included in the out-of-state group.

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

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 once present a second application for admission. With this application there should be submitted a statement in detail concerning the studies and other employments, if any, to be undertaken in furtherance of the applicant's preparation for the work of the Medical School. Obviously, this statement should be submitted to the Committee on Admissions before the additional preparatory work is undertaken. If the applicant's plan receives the committee's approval, his name will then be listed with the names of other applicants for admission to the Medical School at the beginning of the next succeeding university year, and his success in gaining admission will depend upon his scholarship rank as a member of the group of applicants for that year.

An accepted applicant who finds it impossible to begin his work in the Medical School in September, 1947, 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 matricula-

tion 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 laboratory technique, physical therapy, and X ray are offered at the Medical Center, San Francisco.

MEDICAL TECHNICIANS

The Clinical Laboratories of the University of California Hospital offer a training program to students preparing to be medical technicians. This training program is part of the curriculum given by the School of Public Health, leading to the degree of Bachelor of Science.

For further information, write to the Dean's Office, School of Public Health, University of California, Berkeley 4, California.

PHYSICAL THERAPY

The course in physical therapy covers a period of one year (48 weeks) or three semesters. The next class will start on September 23, 1946.

Requirements for Admission.

Applicants for admission must present transcripts of college or university work. Such records must show the satisfactory completion of work in the following courses:

Chemistry 1A	5 units
Physics 2A-2B and 3A-3B	8 units
Anatomy 102	3 units
Physiology 1A and 1C	5 units
Psychology 168	3 units

Curriculum. The first two semesters cover all theory, seminars, and demonstration. The third semester (16 weeks) is devoted to practical training and can be completed in either a military or one of the following civilian hospitals, University of California, Langley Porter Clinic, Children's, St. Luke's, Franklin, and Children's of the East Bay. The curriculum includes courses in anatomy, physiology, physics, pathology, psychology, surgery, orthopedic surgery, medicine, neurology, pediatrics, nursing ethics and administration, electrotherapy, radiation, hydrotherapy, massage, kinesiology, therapeutic exercise, and clinical practice.

Certificate. A certificate of completion is issued by the University at the end of the course to those who have successfully fulfilled all of the requirements.

For further information, write to the Director, Department of Physical Medicine, University of California Hospital, 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.

Appointments to the course are made after personal interview with the director.

Curriculum. Student technicians spend from 8:30 A.M. to 4:40 P.M. each day in rotating through the various divisions of the X-ray Department, so that the student, when he has finished, 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, dark room, dental department, and in therapy. 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 of Science 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 64 of this Catalogue.

Enrollment in the School of Nursing is limited, and candidates for admission are accepted on the basis of scholarship in the prenursing program and on physical fitness as determined by careful examination. The Committee on Admissions to the Nursing School is authorized to refuse admission to a student with a low academic record, and reserves the right to reject any applicant on the ground of obvious physical, mental, or moral disability.

Students completing the 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 1C	5	..
Chemistry 1A	5	..	Anatomy 102 .....	..	3
Bacteriology 2.....	..	4	Psychology 1A and 1B, or 2	3	3
English or Public Speaking (year course)	3	3	Economics 1A-1B	3	3
Year course	3	3	‡Electives	4	6
‡Electives	4	5			
	15	15		15	15

American History and Institutions examinations, or courses in satisfaction of the requirement, should be completed. See page 37.

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, 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

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

Faculty of the School of Nursing. Not more than 30 units of work completed in a school of nursing other than that of the University of California will be accepted in partial satisfaction of this requirement.

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 Public Speaking (year course).....	3	3
Year Course	3	3
	15	15

†Second Year

Psychology 1A and 1B, or 2.....	3	3
Natural Science	4	..
Economics 1A-1B	3	3
‡Electives.....	5	9
	15	15

* Chemistry 1A (5), Physiology 1A, 10 (5) and Anthropology 1A (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 64.

‡ 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

	<i>Mini- mum Fall Units</i>	<i>Maxi- mum Spring Units</i>		<i>Mini- mum Fall Units</i>	<i>Maxi- mum Spring Units</i>
15 units selected from:			15 units selected from:		
Medical Nursing	2	3	Nutrition	3	6
Surgical Nursing	2	3	Social Aspects of Nursing	2	3
Obstetrical Nursing	2	3	History of Nursing	2	3
Pediatric Nursng	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 37.

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 circular.

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 leading to a Bachelor of Science degree and to a Certificate of Completion in Optometry.

Requirements for Admission. As prerequisites, students should offer the following high school subjects for matriculation: algebra, plane geometry, trigonometry, chemistry, physics, three years of foreign language. Mechanical drawing is recommended.

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 or the equivalent. The courses taken for the degree of Associate in Arts should include the specific subjects required by the School of Optometry.

The following program if satisfactorily completed will meet the requirements for the degree of Associate in Arts in the College of Letters and Science at the end of the fourth semester, and the prerequisite subjects for the study of optometry.* The degree of Bachelor of Science and the Certificate of Completion in Optometry will be awarded upon satisfactory completion of the entire program with the necessary grade points.

<i>Freshman Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Sophomore Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
¹ Subject A . . . . .	..	..	Military Science	2 or 0	2 or 0
Military Science	2 or 0	2 or 0	Physics 2A-2B	3	3
Public Speaking 1A-1B.	3	3	Physics 3A-3B	1	1
Foreign Language	4	4	Physiology 1A	3	..
Chemistry 1A-1B	5	5	Physiology 1C	2	..
Bacteriology 2 . . . . .	..	4	Psychology 1A-2	3	3
² Elective	0 or 3	0	Mathematics 3A . . . . .	..	3
			Chemistry 8 . . . . .	..	3
			² Elective	0 or 3	0 or 2
	14 or 15	16 or 18		14 or 15	15 15

* The expansion of the Curriculum in Optometry to a five-year program is under consideration. Ample notice will be given later as to the exact date on which any change in the program is to become effective.

¹ An examination in Subject A (English Composition) is required of all undergraduate intrants. For further regulations concerning Subject A, see page 36.

² See Associate in Arts degree requirements, College of Letters and Science, as described on page 64.

Undergraduate Departments

Junior Year			Senior Year		
	Fall Units	Spring Units		Fall Units	Spring Units
³ American History and Institutions .....	..	..	Optometry 103A-103B...	3	3
Anatomy 102	3	..	Physiological Optics 105A- 105B	4	4
Physiology 115 .....	..	3	Optometry 404A-404B ...	3	3
Physics 108A-108B (2) ..	3	3	Optometry 406A-406B ...	2	2
Optometry 102A-102B ...	3	4	Optometry 407A-407B ...	2	1
Optometry 401A-401B ..	2	2	Physiology 110A-110B ..	3	3
Elective	5	4			
	<hr/>	<hr/>		<hr/>	<hr/>
	16	16		17	16

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.

SCHOOL OF PUBLIC HEALTH

Admission. To be admitted to the School of Public Health, students must have completed the requirements for the degree of Associate in Arts or an equivalent thereof satisfactory to the Faculty of the School of Public Health. In addition they should have completed the lower division prerequisite courses prescribed by the Faculty of the School.

³ Required of all candidates for the bachelor's degree; see page 87.

Preparation. An organized program of work fulfilling the requirements for admission to the upper division in any of the schools or colleges of the University will provide sound preparation for work in the School of Public Health. It is highly desirable for candidates for admission to the School to complete the lower division prerequisites prior to entrance. (See below.)

SUGGESTED LOWER DIVISION PROGRAM PREPARATORY TO
ADMISSION TO THE SCHOOL OF PUBLIC HEALTH

(1) *General Requirements.*

Subject A. (See page 36.)

Military Science and Tactics (men). (See page 38.)

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 4 units of this requirement and each year thereafter as 4 units.

Mathematics. Elementary algebra and plane geometry.

(2) *Preparation for the Major.* (These courses are prerequisite to upper division Public Health courses.)

Science.

Bacteriology 2.

Chemistry 1A, 1B, 5, 8.

Zoölogy 1A or Physiology 1A, 1C.

Public Health 5A-5B.

Psychology 1A.

At least one of the following sequences:

Anthropology 1A-1B.

Economics 1A-1B.

Geography 1, 2.

Political Science 1, 2.

Social Institutions 1A-1B.

(It is recommended that an additional year sequence be taken in English or Public Speaking, or in Mathematics.)

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, at least 60 units of which shall have been in upper division courses as prescribed by the curriculum, not less than 24 units of which shall have been completed 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 p. 37.)

THE MAJORS

Major for Public Health Laboratory Technicians:

Bacteriology 101.
 Biochemistry 103, 104.
 Public Health 163A, 164A, 105, 147A, 151, 158.

At least 7 units from the following:

Biochemistry 110.
 Entomology (Agriculture) 117, 126.
 Home Economics 106.
 Physiology 110A-110B, 112.
 Public Health 152.
 Zoölogy 110, 111, 140.

Upper division electives to make a total of 60 upper division units.

Major for Public Health Sanitarians:

(In addition to courses required under *Preparation for the Major*, Physics 1A-1B, and Public Speaking 2A-2B will be required. Public Speaking 2A-2B may be used to satisfy the year sequence under *Preparation for the Major*.)

Public Health 105, 111, 112, 113A-113B, 145, 147A, 153, 163A, 164A, 199.
 Bacteriology 101.
 Civil Engineering 124, 125.
 Entomology 126.
 Political Science 181.

Upper division electives to make a total of 60 upper division units.

Major for Public Health Statisticians:

Bacteriology 101.
 Biochemistry 103, 104.
 Political Science 181.
 Public Health 105, 147A, 147B, 151, 163A, 163B, 164A, 164B.

At least 3 units chosen from:

Public Health 148.
 Public Health 168.
 Public Health 169.

Upper division electives to make a total of 60 upper division units.

Recommended upper division electives:

Agricultural Economics 113.
 Anthropology, any upper division course.
 Architecture 117A-117B.
 Economics 101A-101B, 106, 150A-150B, 180, 185.
 Education 111.
 Geography 121, 122A, 122B, 142, 143.
 Mathematics 120A-120B.
 Political Science 183.
 Public Health 121, 163C, 112.
 Social Institutions 101A, 101B, 121A, 131A, 151A.
 Social Welfare 104, 105, 106.
 Zoölogy 114.

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, college of dentistry, college of engineering, or have received the Bachelor's degree from an approved college or university, provided the candidate's program has included such a substantial amount of satisfactory work in the biological, physical, and social sciences as will, in the judgment of the Faculty of the School of Public Health, constitute an adequate preparation for his proposed field of specialization. A student who has not completed the basic requirements for the degree of Bachelor of Science in the School of Public Health of the University of California, or their equivalent, must include them in his graduate program.

Requirements.

- (1) At least one year of graduate residence 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. With the approval of the Executive Committee of the Faculty, a candidate may be authorized to present an acceptable thesis in lieu of 4 of the 24 units required.
- (2) A comprehensive final examination either in the student's field of specialization or in the general field of public health, as determined by the students supervisory faculty committee.
- (3) At least twelve weeks of approved field service in a public health agency.

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 have the degree of Doctor of Medicine from an approved medical school.

Requirements.

- (1) At least 60 units of work in a curriculum approved by the Faculty of the School of Public Health, and by the Graduate Council of the Northern Section, with an average grade not lower than B. This program must include not less than:
 - (a) Twenty units in the fields of public health administration, public health bacteriology and immunology, vital statistics, biometry, and epidemiology.
 - (b) Twenty units in the fields of human nutrition, protozoology and parasitology, sanitary engineering, child hygiene, industrial hygiene, social economics, public administration, and mental hygiene.

At least 30 of these units must be completed during residence at the University of California.

- (2) A thesis based on investigation in one of the above fields.
- (3) Six weeks' field service completed in an approved public health agency.

CERTIFICATE IN PUBLIC HEALTH

Admission. Applicants must be eligible for graduate standing in the University of California, and must be less than 36 years of age.

- (1) *Curriculum for Health Officers.* Applicants must have the degree of Doctor of Medicine from an approved medical school. They must have had not less than one year of clinical experience in a hospital, preferably in such fields as communicable diseases, pediatrics, and obstetrics.
- (2) *Curriculum for Public Health Engineers.* Applicants must hold a degree in engineering from an approved university or technical school, with specialization in sanitary engineering.
- (3) *Curriculum for Statistical Technicians.* Applicants must be graduates of an approved college or university, and must have completed courses including a substantial amount of satisfactory work in the biological, physical, and social sciences.
- (4) *Curriculum for Laboratory Technicians.* Applicants must be graduates of an approved college or university, and must have completed courses including a substantial amount of satisfactory work in the biological, physical, and social sciences.
- (5) *Curriculum for Health Educators.* Applicants must be graduates of an approved college or university, and must have completed courses including a substantial amount of satisfactory work in the biological, physical, and social sciences.

Requirements.

- (1) At least two semesters of resident study at the University of California.
- (2) At least 25 units of work in an approved program of courses in one of the five curricula named above.
- (3) At least three months' field work in a city, county, or state health department.

CURRICULUM FOR MEDICAL TECHNICIANS

The need and demand for well-trained personnel for service as medical technicians has led the University of California to establish a four-year (eight-semester) curriculum in this field, leading to the degree of Bachelor of Science through the School of Public Health in coöperation with the University Medical School. Instruction will be offered on the Berkeley campus with the exception of the final semester which will be given on the San Francisco campus.

Lower Division Requirements.

	Units
Bacteriology 2	4
Chemistry 1A-1B	10
Chemistry 5	3
Chemistry 8	3
Physics 2A-2B	6
Physics 3A-3B	2
Public Health 5A-5B	6
Zoölogy 1A	4
English 1A-1B or Public Speaking 2A-2B	6
A year course from one of the following departments: Lan- guages, Mathematics, History, Economics, Anthropology, Psychology, Political Science, Sociology and Social Institu- tions	6
Free Electives (Physiology 1A, 1C recommended).....	10

60

Upper Division Requirements.

Given at Berkeley:

Bacteriology 101	6	6
Biochemistry 103, 104, 110.....	4-4-5	13
Public Health 151, 152.....	8-3	11
Zoölogy 140	4	4
Electives		9

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Given at San Francisco:

	Units
Public Health 408, Medical Bacteriology	3
Public Health 409, Medical Chemistry.....	3
Public Health 410, Medical Microscopy	3
Public Health 411, Medical Parasitology	2
Public Health 412, Medical Serology	2
Public Health 413, Tissue Technique	2
Public Health 414, Medical Mycology	1
Public Health 415, Basal Metabolism	1

17

Total	120
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* Those students who may wish to take graduate work are advised to include in their program on the Berkeley campus additional academic units to total 120 before going to San Francisco.

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 in full 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:
 - (1) Completion of the group major in social welfare offered at the University of California, Berkeley, or of an equivalent group major.
 - (2) 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).
 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 80, 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, consisting of at least 40 units of upper division, graduate, and professional courses, subject to the following conditions:
1. The program shall include not less than 24 units of upper division and graduate courses.
 2. Students who have completed graduate courses in 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.
 3. Students who have not completed Social Welfare 110A-110B (The Social Services) or an equivalent course, will be required to offer this course in addition to the 40 units mentioned above, or to present satisfactory evidence of familiarity with the subject matter of the course.
- (d) Have completed a satisfactory thesis; provided that the Faculty of the School of Social Welfare may authorize students, in exceptional cases, to offer in lieu of this requirement four units of graduate courses (completed with an average grade not lower than B) additional to the courses required under (c) above, and to pass a comprehensive final examination in the field of social welfare.

- (e) Have maintained, in at least 20 units of those upper division and graduate courses undertaken in graduate residence at the University of California, an average grade not lower than B; provided, however, that students who have completed a part of the required program elsewhere than at the University of California 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 not later than the fifteenth day of April 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.

NOTE: No further applications for admission to the School of Social Welfare for the academic year 1946-1947 can be accepted. Students interested in applying for the academic year 1947-1948 should file their applications with the School before April 15, 1947.

For further information see the ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE.

COURSES OF INSTRUCTION OFFERED IN THE
DEPARTMENTS AT BERKELEY
FOR THE FALL AND SPRING SEMESTERS
ACADEMIC YEAR 1946-1947

EXPLANATORY NOTE

THE CREDIT VALUE of each course in semester units is indicated for each semester by a number in parentheses following the title. A semester unit is one hour of the student's time at the University, weekly, during one semester, in lecture, or recitation, together with the time necessary in preparation therefor; or a longer time in laboratory or other exercises not requiring preparation. The session in which the course is given is shown as follows: I, first semester (September to February); II, second semester (February to June); Yr, throughout the first and second semesters. When no hours are stated it is understood that these are to be arranged later. Final information concerning class hours will be found in the SCHEDULE AND DIRECTORY.

Year Courses; Double Numbers. A course designated by a double number (for example, History 4A-4B) is continued through two successive semesters, ordinarily from September to June; occasionally, however, the first part of a year course may begin in February. The student should use the first number in registering for the course during its first semester, and the second number during its second semester. The first half of such a course is prerequisite to the second half unless there is an explicit statement to the contrary. A final report is made by the instructor at the end of each semester. The student may discontinue the course at the end of the first semester, with final credit for the first half of the course, except as otherwise noted.

Classification and Numbering of Courses—

Courses are classified and numbered as follows:

(1) *Lower division courses* (numbered 1-49, or sometimes indicated by letters if in subjects usually given in high school). A lower division course is one open to freshmen and to sophomores; such courses do not count as upper division work in any department.

(2) *Upper division courses* (numbered 100-199). An upper division course in any department is one which is open to those students only who have completed a lower division course, or courses, in that department; or is an elementary course in a subject of such difficulty as to require the maturity of upper division students.

Special study courses for advanced undergraduates are numbered 199. Credit in a special study course for undergraduates may not exceed 5 units a semester, except in the case of honor students.

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

(3) *Graduate courses* (numbered 200-299). As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation normally consists of the completion of at least 12 units of upper division work basic to the subject 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, or XL. Such courses are rated, with respect to the general and specific requirements for the bachelor's degree, on the same basis as courses taken in residence at collegiate institutions of approved standing.

For information concerning University Extension courses, apply to the Director, University Extension, University of California, Berkeley 4, California.

†AGRICULTURE

- 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.
ERNEST B. BABCOCK, M.S., Professor of Genetics.
ROY BAINER, M.S., Professor of Agricultural Engineering, Davis.
HORACE A. BARKER, Ph.D., Professor of Soil Microbiology.
JAMES T. BARRETT, Ph.D., Professor of Plant Pathology.
ELBERT T. BARTHOLOMEW, Ph.D., Professor of Plant Physiology, Riverside.
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.
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.
HOMER D. CHAPMAN, Ph.D., Professor of Agricultural Chemistry, Riverside.
ROY E. CLAUSEN, Ph.D., Professor of Genetics.
HAROLD H. COLE, Ph.D., Professor of Animal Husbandry, Davis.
JOHN P. CONRAD, Ph.D., Professor of Agronomy, Davis.
ALDEN S. CRAFTS, Ph.D., Professor of Botany, Davis.
BERTRAM H. CROCHERON, M.S.A., Professor of Agricultural Extension.
WILLIAM V. CRUESS, Ph.D., Professor of Food Technology.
LUTHER D. DAVIS, Ph.D., Professor of Pomology, Davis.
JOHN E. ECKERT, Ph.D., Professor of Entomology, Davis.
HENRY E. ERDMAN, Ph.D., Professor of Agricultural Economics.
EDWARD O. ESSIG, M.S., Professor of Entomology.
HOWARD S. FAWCETT, Ph.D., Professor of Plant Pathology, Riverside.
STANLEY B. FREEBORN, Ph.D., Professor of Entomology.
MAX W. GARDNER, Ph.D., Professor of Plant Pathology.
HAROLD GOSS, Ph.D., Professor of Animal Husbandry, Davis.
JOHN W. GREGG, B.S., Professor of Landscape Design.
HAROLD R. GUILBERT, M.S., Professor of Animal Husbandry, Davis.
HANS N. HANSEN, Ph.D., Professor of Plant Pathology.
GEORGE H. HART, M.D., D.V.M., Professor of Animal Husbandry, Davis.

† Herein are described the courses in the Department of Agriculture to be given at Berkeley, fall and spring semesters, 1946-1947, 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 1946-1947, to be obtained from the Dean of the College of Agriculture, University of California, Berkeley 4.

- WILLIAM R. HINSHAW, D.V.M., Ph.D., Professor of Veterinary Science, Davis.
 DENNIS R. HOAGLAND, M.A., Professor of Plant Nutrition.
 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).
- ² HANS JENNY, Sc.D., Professor of Soil Chemistry and Morphology.
 WALTER P. KELLEY, Ph.D., Professor of Soil Chemistry.
 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.
 SAMUEL LEPKOVSKY, Ph.D., Professor of Poultry Husbandry.
 BEN A. MADSON, B.S.A., Professor of Agronomy, Davis.
 ROBERT F. MILLER, M.S., Professor of Animal Husbandry, Davis.
 COURTLAND S. MUDGE, Ph.D., Professor of Bacteriology, Davis.
 EDWARD L. PROEBSTING, Ph.D., Professor of Pomology, 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.
 TRACY I. STORER, Ph.D., Professor of Zoölogy, Davis.
- ³ LEWIS W. TAYLOR, Ph.D., Professor of Poultry Husbandry.
 DOROTHY S. THOMAS, Ph.D., Professor of Rural Sociology.
 H. EARL THOMAS, Ph.D., Professor of Plant Pathology.
 JAMES M. TINLEY, Ph.D., Professor of Agricultural Economics.
 WARREN P. TUPTS, Ph.D., Professor of Pomology, Davis.
 FRANK J. VEIHMEYER, 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.
 HARRY R. WELLMAN, Ph.D., Professor of Agricultural Economics.
 JAMES F. WILSON, M.A., LL.D., Professor of Animal Husbandry, Davis.
 ALBERT J. WINKLER, Ph.D., Professor of Viticulture, Davis.
 HERBERT A. YOUNG, Ph.D., Professor of Chemistry, Davis.
 FRANK ADAMS, M.A., Professor of Irrigation, Emeritus.
 JOHN S. BURD, B.S., Professor of Plant Nutrition, Emeritus.

³ In residence spring semester only, 1946-1947.

- WILLIAM B. HERMS, Sc.D., Professor of Parasitology, Emeritus.
WALTER L. HOWARD, Ph.D., Professor of Pomology, Emeritus, Davis.
WILLIAM W. MACKIE, M.S., Agronomist in the Experiment Station, 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.
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.
HUGH S. CAMERON, D.V.M., Ph.D., Associate Professor of Veterinary Science, Davis.
LAWRENCE L. CLAYPOOL, Ph.D., Associate Professor of Pomology, Davis.
IRA J. CONDIT, Ph.D., Associate Professor of Subtropical Horticulture, Riverside.
RODERICK CRAIG, Ph.D., Associate Professor of Insect Physiology.
KATHERINE ESAU, Ph.D., Associate Professor of Botany, Davis.
PAUL W. GREGORY, Sc.D., Associate Professor of Animal Husbandry, Davis.
FREDERICK L. GRIFFIN, M.S., Associate Professor of Agricultural Education, Davis.
WILLIAM Z. HASSID, Ph.D., Associate Professor of Plant Nutrition.
SIDNEY S. HOOS, Ph.D., Associate Professor of Agricultural Economics.
EUGENE L. JACK, Ph.D., Associate Professor of Dairy Industry, Davis.
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.
LYSLE D. LEACH, Ph.D., Associate Professor of Plant Pathology, Davis.
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.
SYLVESTER W. MEAD, M.S., Associate Professor of Animal Husbandry, Davis.
BEN D. MOSES, B.S., Associate Professor of Agricultural Engineering, Davis.
EMIL M. MRAK, Ph.D., Associate Professor of Food Technology.
IVER N. NELSON, Ph.D., Associate Professor of Spanish, Davis.
HAROLD P. OLMO, Ph.D., Associate Professor of Viticulture, Davis.
ROY OVERSTREET, Ph.D., Associate Professor of Soil Chemistry.
RUSSELL L. PERRY, M.E., Associate Professor of Agricultural Engineering, Davis.
VERNON J. PURYEAR, Ph.D., Associate Professor of History, Davis.
HAROLD G. REIBER, Ph.D., Associate Professor of Chemistry, Davis.
GEORGE A. RICHARDSON, Ph.D., Associate Professor of Dairy Industry, Davis.

² In residence spring semester only, 1946-1947.

- EDWARD B. ROESSLER, Ph.D., Associate Professor of Mathematics, Davis.
 WILLIAM C. SNYDER, Ph.D., Associate Professor of Plant Pathology.
 * G. LEDYARD STEBBINS, JR., Ph.D., Associate Professor of Genetics.
 MORRIS A. STEWART, Ph.D., Associate Professor of Parasitology.
 PERRY R. STOUT, Ph.D., Associate Professor of Plant Nutrition.
 H. LELAND VAUGHAN, B.S., Associate Professor of Landscape Design.
 DAVID WEEKS, Ph.D., Associate Professor of Agricultural Economics.
 THOMAS E. WEIER, Ph.D., Associate Professor of Botany, Davis.
 EDWARD E. WILSON, Ph.D., Associate Professor of Plant Pathology, Davis.
 CELESTE TURNER WRIGHT, Ph.D., Associate Professor of English, Davis.
 CECIL E. YARWOOD, Ph.D., Associate Professor of Plant Pathology.
 ROBERT W. ALLARD, B.S., Assistant Professor of Agronomy, Davis.
 MAYNARD A. AMERINE, Ph.D., Assistant Professor of Enology, Davis.
 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.
 ALAN A. BEETLE, Ph.D., Assistant Professor of Agronomy, Davis.
 RICHARD M. BOHART, Ph.D., Assistant Professor of Entomology, Davis.
 REID M. BROOKS, Ph.D., Assistant Professor of Pomology, Davis.
 ALBERT C. BURDETTE, Ph.D., Assistant Professor of Mathematics, Davis.
 HERBERT B. CURRIER, Ph.D., Assistant Professor of Botany, Davis.
 ARTHUR E. DAVEY, Ph.D., Assistant Professor of Pomology, Davis.
 GLEN N. DAVIS, Ph.D., Assistant Professor of Truck Crops, Davis.
 LANNES E. DAVIS, Ph.D., Assistant Professor of Soils, 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.
 SOLOMON FISHMAN, Ph.D., Assistant Professor of English, Davis.
 JULIUS H. FREITAG, Ph.D., Assistant Professor of Entomology.
 ORVAL C. FRENCH, M.S., Assistant Professor of Agricultural Engineering,
 Davis.
 MILTON E. GARDNER, Ph.D., Assistant Professor of Physics, Davis.
 CHARLES M. GILBERT, Ph.D., Assistant Professor of Geology, Davis.
 HUBERT HEITMAN, JR., Ph.D., Assistant Professor of Animal Husbandry,
 Davis.
 WILLIAM B. HEWITT, Ph.D., Assistant Professor of Plant Pathology, Davis.
 BYRON R. HOUSTON, Ph.D., Assistant Professor of Plant Pathology, Davis.
 JAMES A. JENKINS, Ph.D., Assistant Professor of Genetics.
 RAYMOND M. KEEFER, Ph.D., Assistant Professor of Chemistry, Davis.
 F. HOWARD KRATZER, Ph.D., Assistant Professor of Poultry Husbandry,
 Davis.
 GEORGE M. KUZNETS, Ph.D., Assistant Professor of Agricultural Economics.

* In residence spring semester only, 1946-1947.

- 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.
OSCAR A. LORENZ, Ph.D., Assistant Professor of Truck Crops, 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.
MILTON A. MILLER, Ph.D., Assistant Professor of Zoölogy, Davis.
LEONARD L. MORRIS, Ph.D., Assistant Professor of Truck Crops, Davis.
LOREN W. NEUBAUER, M.S. in C.E., Assistant Professor of Agricultural Engineering, Davis.
CHARLES G. PATTEN, Ph.D., Assistant Professor of Physics, Davis.
NOEL P. RALSTON, Ph.D., Assistant Professor of Animal Husbandry, Davis.
CHARLES M. RICK, JR., Ph.D., Assistant Professor of Truck Crops, Davis.
LAUREN E. ROSENBERG, Ph.D., Assistant Professor of Zoölogy, Davis.
PAUL G. SMITH, Ph.D., Assistant Professor of Truck Crops, Davis.
ERNEST H. STANFORD, Ph.D., Assistant Professor of Agronomy, Davis.
CLIFFORD R. STOCKING, Ph.D., Assistant Professor of Botany, Davis.
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.
REESE H. VAUGHN, Ph.D., Assistant Professor of Food Technology.
DAVID H. VOLMAN, Ph.D., Assistant Professor of Chemistry, Davis.
SPENCER W. BROWN, Ph.D., Instructor in Genetics.
DAVID T. BUTTS, JR., B.S., Instructor in Military Science and Tactics, Davis.
LEONORA A. HOHL, Ph.D., Instructor in Food Technology.
PAUL A. JORGENSEN, Ph.D., Instructor in English, Davis.
HERMAN J. PHAFF, Ph.D., Instructor in Food Technology.
CHARLES W. SCHALLER, Ph.D., Instructor in Agronomy, Davis.
JAMES H. SHIDELER, Ph.D., Instructor in History, Davis.
RAY F. SMITH, Ph.D., Instructor in Entomology.
WILLIAM N. TAKAHASHI, Ph.D., Instructor in Plant Pathology.
-
- PAUL S. TAYLOR, Ph.D., Professor of Economics.
EVERETT D. HOWE, M.S., Associate Professor of Mechanical Engineering.
EDWARD A. STEINHAUS, Ph.D., Assistant Professor of Bacteriology and Assistant Insect Pathologist.
HERBERT L. BELTON, Associate in Agricultural Engineering, Davis.
ARTHUR D. BORDEN, M.A., Lecturer in Entomology.
J. BURDETTE BROWN, C.E., Lecturer in Irrigation, Davis.

JOHN G. B. CASTOR, Ph.D., Junior Enologist in the Experiment Station, Davis.
LEONARD H. DAY, M.S., Associate Pomologist in the Experiment Station, Davis.

LOYD D. DONEEN, Ph.D., Associate Irrigation Agronomist in the Experiment Station, Davis.

CHARLES R. GRAU, B.S., Associate in the Experiment Station.

JAMES F. GUYMON, Ph.D., Assistant Enologist in the Experiment Station, Davis.

GORDIE C. HANNA, B.S., Lecturer in Truck Crops, Davis.

CARL J. HANSEN, M.S., Associate in Pomology, Davis.

WILLIAM A. HARVEY, M.S., Associate in Botany and Associate in the Experiment Station, Davis.

ARTHUR H. HENDRICKSON, Ph.D., Pomologist in the Experiment Station, Davis.

VERNARD B. HICKEY, A.B., Associate Supervisor of Physical Education, Davis.

CARROLL E. HOWELL, M.S., Associate in Animal Husbandry, Davis.

JOHN R. KING, Ph.D., Assistant Pomologist in the Experiment Station, Davis.

WILLIAM H. LANGE, JR., Ph.D., Lecturer in Entomology, Davis.

HAROLD D. LEWIS, B.S., Associate in Agricultural Engineering, Davis.

OMUND LILLELAND, Ph.D., Pomologist in the Experiment Station, Davis.

GWENDOLYN B. NEEDHAM, Ph.D., Lecturer in English, Davis.

EDWIN R. PARKER, Ph.D., Associate Horticulturist in the Experiment Station, Riverside.

CLEMENT A. PHILLIPS, M.S., Associate in Dairy Industry, Davis.

GUY L. PHILP, M.S., Associate in Pomology, Davis.

MYRON R. SCHALL, A.B., Assistant Supervisor of Physical Education, Davis.

HENRY H. P. SEVERIN, Ph.D., Entomologist in the Experiment Station.

EUGENE M. STAFFORD, Ph.D., Assistant Entomologist in the Experiment Station, Davis.

WALTON B. SINCLAIR, Ph.D., Associate Biochemist, Riverside.

LESLIE M. SMITH, Ph.D., Lecturer in Entomology, Davis.

PATRICIA G. SIKES, M.A., Associate in English, Davis.

JOHN L. STAHL, A.B., Associate in Landscape Gardening, Davis.

RAYMOND E. STORIE, B.S., Lecturer in Soil Technology.

GEORGE A. STROMGREN, A.B., Assistant Supervisor of Physical Education, Davis.

CHRISTIAN M. TOMPKINS, Ph.D., Associate Plant Pathologist in the Experiment Station.

IRVING F. TOOMEY, B.S., Supervisor of Physical Education, Davis.

WILLIAM O. WILLIAMS, Ph.D., Assistant Viticulturist in the Experiment Station; 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, 112, 113; Entomology 1, 106, 112, 127; Forestry 1, 103, 125; all undergraduate courses in ge-

netics except 104; Home Economics 1A-1B, 7, 10, 14, 101A-101B, 102A-102B, 103, 106, 120A-120B, 132, 141, 142, and 144; Plant Pathology 121; Soil Science 110, 111, 112, 113, 114, 115. For regulations governing this list see page 81.

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 146 of this Catalogue. 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.

Laboratory Fees are charged in certain courses as stated in each case in the description of the course.

(GIVEN AT BERKELEY)

AGRICULTURAL CHEMISTRY

GRADUATE COURSE

201A-201B. Research in Agricultural Chemistry. (1-6; 1-6) Yr.

The STAFF and members of the group in
Agricultural Chemistry.†

The research work will ordinarily be under the direction of a member of the instructing staff who is in the field of agriculture in which the student's preparation has been found to be adequate.

AGRICULTURAL ECONOMICS

An average grade of at least C in all courses undertaken is prerequisite to all upper division courses in agricultural economics.

1. The Agricultural Industry. (3) I.

Mr. VOORHIES

Comparison of agriculture with other industries: population, production, improvements, trends, etc. Historical sketch of the development of agriculture. Types of farming and their geographical distribution. Movements of agricultural products. Institutional aids to agriculture.

100. Comparative Agriculture. (3) I.

Mr. VOORHIES

Prerequisite: Economics 1A-1B.

The agriculture of the principal countries of the world, with special reference to the influence of food supply upon the development of man.

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

- 101A. Principles of Marketing Agricultural Products. (3) I. 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. Mr. HOOS
Prerequisite: Economics 1A-1B.
The application of economic principles to the problems of agriculture.
105. Agricultural Economics Measurements. (3) I. Mr. KUZNETS
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.
112. Seminar in Rural Sociology. (2) I. Mr. P. S. TAYLOR
The forms of human association in rural environment, including their origin, development, structure, functioning, and cultural products. Rural population, social organization and institutions, social psychology, ecological patterns, social change, social pathology.
113. Population Problems. (3) I. Mrs. THOMAS
Prerequisite: Economics 40.
Urban, rural and regional variation in population phenomena; differential fertility and mortality; selective migration.
116. Agricultural Policy. (3) II. Mr. BENEDICT
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 policy problems.

118. Farm Organization. (3) II. Mr. TINLEY
Prerequisite: 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.
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.
NOTE: May be repeated without duplication of credit.
203. Research in Agricultural Economics. (1-6) I and II.
The STAFF (Mr. WELLMAN in charge)
- *204A. Research Methods. (2) I. _____
Consideration of types of approach in social science research.
- 204B. Analytical Methods in Agricultural Economics. (3) I. Mr. KUZNETS
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) II. 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.

* Not to be given, 1946-1947.

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.

AGRICULTURAL ENGINEERING

12. Survey and Problems in Agricultural Engineering. (2) II.
Mr. WALKER, Mr. BAINER
The development, 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. _____
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.
Mr. MADSON, Mr. BRIGGS, Mr. CONRAD, Mr. LOVE
Prerequisite: 6 units of upper division agronomy.

GRADUATE COURSE

- 200A-200B. Research in Agronomy. (1-6; 1-6) Yr.
Mr. MADSON, Mr. BRIGGS, Mr. CONRAD, Mr. LOVE, Mr. SCHALLER

ANIMAL HUSBANDRY

- *7. Introduction to Animal Husbandry. (3) II.
The STAFF (Mr. HART 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.

* Not to be given, 1946-1947.

106. Insect Morphology and Histology. (4) I. Mr. CRAIG
Lectures and laboratory.
Prerequisite: Entomology 1. Fee, \$2.50.
110. Insect Physiology. (3) II. Mr. CRAIG
Lectures and laboratory. Fee, \$2.50.
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 trip on Saturday.
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. The laboratory exercises are devoted to the taxonomy and identification of the parasites and to diagnostic laboratory methods.
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
Lectures and laboratory. Fee, \$2.50.
The role of insects in the transmission and causation of plant virus diseases. Greenhouse insect rearing and virus transmission experiments.
126. Medical Entomology. (4) II. Mr. STEWART
Lectures 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. Fee, \$2.50.
Chemical composition and reactions of insecticides and fungicides, and their physiological effects on plant and animal tissues.
130. Agricultural Entomology. (2) II. Mr. BORDEN
Lecture and laboratory.
The principles and practices of experimental field entomology.

131. Insect Pathology. (4) II. Mr. STEINHAUS
Lecture and laboratory.
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
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
Lecture and laboratory.
Habits and ecology of aquatic and semiaquatic insects with emphasis on their relations to problems of wild-life management. It is expected that this course will satisfy the entomological requirements for students of the wild-life curriculum.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. ESSIG in charge)

GRADUATE COURSES

- 200A-200B. Seminar in Systematic, Economic Entomology, and Insect-borne Plant Diseases. (1-1) Yr.
Mr. ESSIG, Mr. FREITAG, Mr. LINSLEY, Mr. MIDDLEKAUFF, Mr. SEVERIN, Mr. USINGER
- 201A-201B. Research in Entomology and Parasitology. (1-6; 1-6) Yr.
Mr. CRAIG, Mr. ESSIG, Mr. FREEBORN, Mr. FREITAG, Mr. HOSKINS, Mr. LINSLEY, Mr. MIDDLEKAUFF, Mr. MICHELbacher, Mr. SEVERIN, Mr. STEINHAUS, Mr. STEWART, Mr. USINGER
- 202A-202B. Seminar in Medical Entomology and Parasitology. (1-1) Yr. Mr. STEWART
- 203A-203B. Seminar in Insect Toxicology, Insect Physiology, and Insect Pathology. (1-1) Yr. Mr. CRAIG, Mr. HOSKINS, Mr. STEINHAUS

FOOD TECHNOLOGY

- 112A-112B. Food Technology. (3-3) Yr.
Mr. CRUICK, Mr. JOSLYN, Mr. MRAK, Mr. PHAFF
Prerequisite: Chemistry 1A-1B and Bacteriology 2. Course 112A is not prerequisite to 112B.
Physical, chemical, bacteriological, and economic principles and technological processes involved in the preparation, preservation, and examination of fruit and vegetable products including canned, dried, and fermented products.

- 115A-115B. Food Technology. (4-4) Yr.
Mr. JOSLYN, Mr. MACKINNEY, Mr. MARSH, Mr. VAUGHN
Lectures and laboratory.
Prerequisite: Chemistry 1A-1B, 5 and 8; Bacteriology 2. Fee, \$6 a semester.
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, Miss HOHL, Mr. PHAFF
Lectures and laboratory.
Prerequisite: Chemistry 1A-1B, 5 and 8; Botany 1A-1B or 12; Bacteriology 2.
Morphology, development and classification of yeasts; relation to other fungi; growth requirements; metabolic and other activities of yeast including their zymological and industrial aspects.
- 127A-127B. Proseminar in Food Technology. (1-1) Yr. Mr. CRUESS
Assigned topics, reports, and discussions.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. CRUESS in charge)
Opportunity for the study of yeasts, plant pigments, oxidation reduction, and plant enzymes.

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 pages 288-291)

GENETICS

100. Principles of Genetics. (4) I. Mr. DEMPSTER
Lectures and laboratory.
Prerequisite: Botany 1A, Zoölogy 1A, and either Botany 1B, or Zoölogy 1B, or Botany 12, 16, and Zoölogy 1A. Fee, \$2.50.
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.
Lectures and assigned reading with reports on problems in plant cytogenetics. A laboratory course, Botany 131, may be taken concurrently.
102. Advanced Genetics. (3) I. Mr. JENKINS
Prerequisite: Genetics 100.
With special reference to methods. Intended to supplement course 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. 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.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. BABCOCK in charge)

GRADUATE COURSES

- 200A-200B. Research in Genetics. (1-6; 1-6) Yr.
Mr. BABCOCK, Mr. ASMUNDSON, Mr. BRIGGS, Mr. CLAUSEN,
Mr. DEMPSTER, Mr. GREGORY, Mr. JENKINS, Mr. LOVE, Mr.
OLMO, Mr. RICK, Mr. STEBBINS
- 201A-201B. Seminar in Genetics. (1-1) Yr.
Reports and discussions. The STAFF (Mr. BABCOCK in charge)

HOME ECONOMICS

(For courses in Home Economics, see pages 316-321)

HORTICULTURE

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

LANDSCAPE DESIGN

- Art 2A-2B, Botany 12, Architecture 1, Landscape Design 1A-1B, 2, and Engineering 21 are prerequisite to all upper division courses in Landscape Design.
- 1A-1B. The Theory and Aesthetics of Landscape Design. (3-3) Yr.
Lectures and laboratory. Mr. GREGG
The different styles of landscape art and principles governing correct design.
2. History and Literature of Landscape Design. (2) II. Mr. VAUGHAN
Limited to major students only.
Early influences and their effect on modern practice.
49. Summer Practice and Observation Course. (No credit.)
The STAFF (Mr. GREGG in charge)
Students may register for this course at the end of the junior year.

* Not to be given, 1946-1947.

- 101A-101B. Elementary Problems in Landscape Design. (3-3) Yr.
Lectures and laboratory. Mr. VAUGHAN
Elementary problems in landscape design.
- 111A-111B. Landscape Design and Construction. (4-4) Yr. Mr. VAUGHAN
Lecture and laboratory.
Problems of design and reconstruction with special reference to grading, retaining walls, steps, pools, pergolas, irrigation and drainage systems; reports and estimates.
NOTE.—In courses 112, 113, 114, 115 both halves of the course may be given each semester if there is sufficient demand.
- 112A-112B. Plant Materials. (3-3) Yr. Mr. SHEPHERD
Lecture and laboratory.
The form, habit, texture, and adaptation of trees, shrubs, vines, and herbaceous plants.
- 113A-113B. Plant Materials. (3-3) Yr. Mr. SHEPHERD
Lecture and laboratory.
Advanced study of plant adaptations and their landscape values, and planting design.
- 114A-114B. Advanced Landscape Design. (4-4) Yr. Mr. GREGG
Lecture and laboratory.
Problems of design and construction from topographic surveys as provided by the larger areas of parks, playgrounds, and country estates, with detailed plans, reports, and estimates.
- 115A-115B. City and Town Planning. (4-4) Yr.
Lectures and laboratory. The STAFF (Mr. GREGG in charge)
Fundamental principles on which the functional planning of a city or town are based.
116. Site Planning. (3) II. Mr. VAUGHAN
One lecture and 2 three-hour laboratory periods to be arranged. Prerequisite: junior standing.
A study of the development of irregular topography for building groups and their attendant outdoor elements. Restricted to students in Architecture and Landscape Design.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. GREGG in charge)

GRADUATE COURSE

- 201A-201B. Modern Civic Art. (1-6; 1-6) Yr.
The STAFF (Mr. GREGG in charge)
Advanced problems in design with special reference to city parks, municipal park systems, recreation areas, civic center, and other civic features in their relation to the city plan as a whole.

PLANT NUTRITION

(For courses in Plant Nutrition, see Soil Science)

PLANT PATHOLOGY

Botany 1A-1B, or 12 and 16, and Bacteriology 1 are prerequisite to course 120. Course 120 is prerequisite to all subsequent courses in plant pathology.

100. Forest Pathology. (3) II. Mr. HANSEN
Lectures and laboratory.
Prerequisite: Botany 1A-1B. Restricted to forestry students. Fee, \$2.50.
Diseases of forest plants.

Mycology. (See Botany 101, 102.)

120. Plant Diseases. (4) I. Mr. BARRETT, Mr. YARWOOD
Lectures and laboratory. Fee, \$2.50.
The nature, cause, and control of plant diseases.

121. Technique of Plant Pathology. (2) II. Mr. RAWLINS
Laboratory. Fee, \$2.50.
(A) Histology; culture methods; interpretation of data; virus 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 1946-1947.

123. Principles of Plant Pathology. (2) II. Mr. THOMAS
The fundamental concepts concerning the causes, nature, spread and control of disease in plants. Nature of parasitism, pathogenesis, susceptibility, and resistance.

125. Diseases of Truck and Field Crops. (2) I. Mr. GARDNER
Laboratory.
The pathology of important crop plants. Dissemination, factors influencing inception and severity of disease, diagnosis, host reaction, control.
NOTE.—This course is given in alternate years. To be given at Berkeley, 1946-1947.

199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. BARRETT, Mr. GARDNER, Mr. SNYDER, Mr. HANSEN, Mr. RAWLINS,
Mr. THOMAS, Mr. TOMPKINS, Mr. ARK, Mr. YARWOOD

GRADUATE COURSES

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr.
The STAFF (Mr. THOMAS in charge)

- 230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr.
Mr. GARDNER, Mr. BARRETT, Mr. HANSEN, Mr. RAWLINS, Mr. SNYDER,
Mr. THOMAS, Mr. TOMPKINS, Mr. ARK, Mr. YARWOOD

POMOLOGY

(For courses in Pomology, see Horticulture)

POULTRY HUSBANDRY

1. Poultry Production. (3) I. Mr. LERNER, Mr. GRAU
Lectures and laboratory. Fee, \$3.50.
An introductory study of the relation of the several sciences underlying poultry production to poultry husbandry practice.
102. Experimental Incubation. (3) II. Mr. L. W. TAYLOR
Lectures and laboratory. Fee, \$3.50.
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. LERNER
Prerequisite: Genetics 100.
Inheritance of characters in poultry and study of the application of genetic principles to problems in poultry breeding.
104. Poultry Feeds and Feeding. (2) I. Mr. LEPKOVSKY
Prerequisite Poultry Husbandry 106, completed or in progress.
A study of the manufacture, composition, and use of poultry feedstuffs.
106. Principles of Animal Nutrition. (3) I. Mr. LEPKOVSKY
Prerequisite: Chemistry 8, Zoölogy 1B, Physiology 1A, 1C, or Animal Husbandry 110.
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.
- 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. LERNER in charge, fall semester;
Mr. L. W. TAYLOR in charge, spring semester)
Prerequisite: Poultry Husbandry 1, courses basic to problems elected, and consent of instructor.

GRADUATE COURSE

- 200A-200B. Research in Poultry Husbandry. (1-6; 1-6) Yr.
Mr. LEPKOVSKY, Mr. LERNER, Mr. L. W. TAYLOR

SOIL SCIENCE

No student will be accepted as a major student in soil science who has not attained at least a C average 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. Fee, \$2.50.
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. (4) II. Mr. JENNY
Lectures and one unit of field work.
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 sections; physical chemistry and calculus (Mathematics 3A-3B). If possible, course 102L should be taken concurrently.
The physical properties of soils and their measurement.
- 102L. Soil Physics. (2) II. Mr. BODMAN, Mr. DAY
Laboratory. Fee, \$3.50.
Prerequisite: Soil Science 102; may be taken concurrently.
Laboratory experiments designed to accompany course 102.
103. Soils of California. (3) I. Mr. STORIE
Lectures and discussion sections. 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.
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. (3) II. Mr. BARKER
Lectures and laboratory. Fee, \$14.
Prerequisite: Chemistry 5 and 8, Bacteriology 2.
The role of microorganisms in nature, particularly in relation to agriculture.
112. The Soil as a Medium for Plant Growth. (2) II. Mr. STOUT
Lectures and conferences.
Prerequisite: Soil Science 110.
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. STOUT
Laboratory. Fee, \$11.50.
Prerequisite: Chemistry 5, Soil Science 112, to be taken concurrently.
114. Properties of Colloids. (3) II. Mr. JENNY
Prerequisite: Chemistry 109.
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 (120B 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. STOUT in charge
Prerequisite: Soil Science 110.
Lectures by several specialists on the nature, use, and application of fertilizers; cover crops, crop rotation; tillage; and such other subjects as are particularly pertinent to California conditions.

General Soil Science

199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. BARKER, Mr. BODMAN, Mr. DAY, Mr. L. E. DAVIS, Mr. HOAGLAND, Mr. JENNY, Mr. KELLEY, Mr. STOUT
Open only to students with at least a B average 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. BARKER, Mr. BODMAN, Mr. L. E. DAVIS, Mr. HOAGLAND, Mr. JENNY, Mr. KELLEY, Mr. STOUT, Mr. ARNON, Mr. DAY

* Not to be given, 1946-1947.

*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.

SOIL TECHNOLOGY

(For courses in Soil Technology, see Soil Science)

SUBTROPICAL HORTICULTURE

For announcement of courses in this field, see under Horticulture in 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 428)

(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. YOUNG in charge)

AGRICULTURAL ECONOMICS

101A. Principles of Marketing Agricultural Products. (3) II. _____

*104. Agricultural Economics. (3) I. _____

118. Farm Organization. (3) I.

Mr. ADAMS

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

The STAFF (Mr. WELLMAN in charge)

AGRICULTURAL ENGINEERING

6. Introduction to Surface Climatology. (2) I.

Mr. F. A. BROOKS

12. Survey and Problems in Agricultural Engineering. (2) II.

Mr. WALKER, Mr. BAINER

* Not to be given, 1946-1947.

- 14A-14B. Farm Mechanics for Teachers. (2-2) Yr.
Mr. WALKER, Mr. LEWIS, Mr. BELTON
49. Summer Field Practice. (6) The STAFF (Mr. WALKER in charge)
102. Unit Operation in Processing Agricultural Products. (3) II. Mr. PERRY
103. Agricultural Power. (3) II. Mr. MOSES
104. Agricultural Machinery. (3) I. Mr. FRENCH
105. Farm Structures. (3) I. Mr. NEUBAUER
113. Agricultural Power. (4) II. Mr. MOSES
114. Agricultural Machinery. (3) I. Mr. BAINER
115. Farm Structures Design. (3) I. Mr. WALKER, Mr. NEUBAUER
130. Proseminar. (1) II. The STAFF (Mr. WALKER in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. WALKER in charge)

GRADUATE COURSE

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

AGRONOMY

1. Introduction to Agronomy. (3) I. _____
110. Principles of Crop Production. (3) I. Mr. MADSON
111. Field Crops. (3) I. Mr. MADSON, _____
112. Field Crop Technology. (3) II. _____
114. Plant Breeding. (3) II. Mr. BRIGGS
115. Range and Forage Crops. (3) II. Mr. LOVE, Mr. BEETLE
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. MADSON in charge)

GRADUATE COURSE

- 200A-200B. Research in Agronomy. (1-6; 1-6) Yr.
Mr. BRIGGS, Mr. MADSON, Mr. CONRAD, Mr. LOVE, Mr. BEETLE,
Mr. STANFORD, Mr. ALLARD, Mr. LAUDE

ANIMAL HUSBANDRY

7. Introduction to Animal Husbandry. (3) I. Mr. HUGHES
8. Livestock Judging and Selection. (2) I. Mr. HUGHES
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. HART
108. Milk Production. (4) II. Mr. REGAN, Mr. RALSTON
110. Physiology of Domestic Animals. (5) I. Mr. 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) II. Mr. J. F. WILSON
115. Horse Production. (3) II. Mr. HOWELL
Care, feeding, management, and problems of production of all classes of horses; development of successful breeding programs; use of horses for power and pleasure.
118. Meat Production. (4) II. Mr. GUILBERT
120. Animal Nutrition. (3) I. Mr. KLEIBER
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. HART in charge)

GRADUATE COURSES

- 200A-200B. Research in Animal Husbandry, Animal Nutrition, Animal Physiology, or Animal Genetics. (1-6; 1-6) Yr.
Mr. HART, Mr. YOUNG, Mr. COLE, Mr. GREGORY, Mr. HOWELL,
Mr. HUGHES, Mr. KLEIBER, Mr. MILLER, Mr. REGAN, Mr. STOREE,
Mr. J. F. WILSON, Mr. GOSS, Mr. GUILBERT, Mr. MEAD
- 201A-201B. Seminar in Animal Nutrition, Animal Physiology, or Animal Genetics. (1-1) Yr.
The STAFF (Mr. HART in charge)

BACTERIOLOGY

1. General Bacteriology. (4) II. Mr. MUDGE

BOTANY

- 1A-1B. General Botany. (4-4) Yr. Mr. CRAFTS, Mr. ROBBINS, Mr. WEIER
 7. Plant Physiology. (4) II. Mr. CRAFTS
 100B. 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
 110B. Systematic Botany of Seed Plants. (3) II. Miss ESAU
 120A-120B. Plant Physiology. (2-2) Yr. Mr. CRAFTS
 121A-121B. Plant Physiology Laboratory. (2-2) Yr. Mr. CRAFTS
 130. Plant Cytology. (4) I. Mr. WEIER

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.
 Mr. YOUNG, Mr. ANDREWS, Mr. KEEFER, Mr. REIBER, Mr. VOLMAN
 5. Quantitative Analysis. (3) II. Mr. VOLMAN
 8. Organic Chemistry. (3) I. Mr. REIBER
 9. Organic Chemistry. (3) I. Mr. ANDREWS and Assistants
 109. Physical Chemistry, Brief Course. (3) II. Mr. YOUNG
 112. Physical Chemistry. (3) I. Mr. KEEFER
 *113. Chemistry of Colloids. (3) I. Mr. VOLMAN
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The STAFF (Mr. YOUNG in charge)
 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
 4. Dairy Products Judging. (1) I. Mr. PHILLIPS
 49. Summer Practice and Observation Course. (6)
 The STAFF (Mr. PHILLIPS in charge)

* Not to be given, 1946-1947.

- 101A-101B. Dairy Products. (5-5) Yr. Mr. ROADHOUSE, Mr. JACK
106. Chemistry of Milk and Dairy Products. (4) II.
Mr. RICHARDSON, Mr. TARASSUK
107. Laboratory Control in Dairy Technology. (3) I. Mr. RICHARDSON
142. Dairy Bacteriology. (3) I. _____
160. Proseminar. (1) I and II. The STAFF (_____ in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (_____ in charge)

GRADUATE COURSES

- 200A-200B. Research in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology. (1-6; 1-6) Yr.
_____, Mr. JACK, Mr. MUDGE, Mr. RICHARDSON,
Mr. ROADHOUSE, Mr. TARASSUK
- 201A-201B. Seminar in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology. (1-1) Yr.
The STAFF (_____ in charge)

DECORATIVE ART

(For courses in Decorative Art, see Home Economics, page 321)

ECONOMICS

- 1A-1B. Principles of Economics. (3-3) Yr. _____

EDUCATION

- 110 Introduction to Educational Psychology. (3) II. _____
- †160. Vocational Education. (2) I and II. Mr. SUTHERLAND
- †161. Problems in Vocational Education. (2) I and II. Mr. SUTHERLAND
- †162. Continuation Education. (2) I and II. Mr. SUTHERLAND
170. Secondary Education. (2) II. _____
198. Directed Group Study. (2) II. Mr. SUTHERLAND
199. Special Study for Advanced Undergraduates in Agricultural Education.
(1-5) I and II. Mr. SUTHERLAND
- 260A-260B. Vocational Education Seminar. (2-2) Yr.
Mr. GRIFFIN, Mr. SUTHERLAND
- †320. Supervised Teaching, Including Professional Methods. (6) I and II.
Mr. SUTHERLAND
- †323. Practicum in Supervised Teaching. (2) I and II. Mr. SUTHERLAND

† Open only to apprentice teachers and graduate students.

ENGINEERING

- 1A. Plane Surveying. (3) I. Mr. BROWN

ENTOMOLOGY AND PARASITOLOGY

105. Apiculture. (4) II. Mr. ECKERT
 116. Veterinary Parasitology. (3) I. Mr. DOUGLAS
 124. Economic Entomology. (4) I. Mr. BAILEY, Mr. L. M. SMITH
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. BAILEY, Mr. BOHART, Mr. DOUGLAS, Mr. ECKERT,
 Mr. LANGE, Mr. L. M. SMITH, Mr. STAFFORD

GRADUATE COURSE

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

GENETICS

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

GRADUATE COURSE

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

GEOLOGY

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

HISTORY

- 4A-4B. History of Western Europe. (3-3) Yr. Mr. PURYEAR
 8A-8B. History of the Americas. (3-3) Yr. Mr. SHIDELER
 17A-17B. History and Institutions of the United States. (3-3) Yr.
 Mr. PURYEAR
 171A-171B. History and Institutions of the United States. (3-3) Yr.
 Mr. PURYEAR
 *185. Government and Agriculture of the United States. (3) II.
 Mr. SHIDELER
 *188A-188B. History of Agriculture in the Americas. (2-2) Yr.
 Mr. PURYEAR
 *189A-189B. History of the Southwest and the Pacific Coast. (2-2) Yr.
 Mr. PURYEAR
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. PURYEAR

* Not to be given, 1946-1947.

HOME ECONOMICS

(For courses offered at Davis, see under Home Economics, page 320)

HORTICULTURE

2. Fruit Growing. (3) I. Mr. L. D. DAVIS
- *10. Plant Propagation. (2) II. Mr. R. E. BAKER
- 105P. Fruit and Fruit Handling. (3) Summer Course (six weeks).
Mr. R. M. BROOKS
- 106A-106B. Fruit Plants. (2-2) Yr. Mr. PROEBSTING, Mr. R. E. BAKER

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, Mr. CASTOR, 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. (1-5) I and II.
Mr. TUFTS, Mr. ALLEN, Mr. AMERINE, Mr. R. E. BAKER, Mr. R. M. BROOKS, Mr. CLAYPOOL, Mr. DAVEY, Mr. L. D. DAVIS, Mr. GUYMON, Mr. JACOB, Mr. KING, Mr. CASTOR, Mr. LILLELAND, Mr. HENDRICKSON, Mr. OLMO, Mr. PROEBSTING, Mr. WILLIAMS, Mr. WINKLER

GRADUATE COURSES

- 201A-201B. Research in Pomology. (1-6; 1-6) Yr.
Mr. TUFTS, Mr. ALLEN, Mr. R. E. BAKER, Mr. R. M. BROOKS, Mr. CASTOR, Mr. CLAYPOOL, Mr. DAVEY, Mr. L. D. DAVIS, Mr. HENDRICKSON, Mr. LILLELAND, Mr. PROEBSTING, Mr. KING
- 205A-205B. Seminar. (1-1) Yr. Mr. L. D. DAVIS
- 233A-233B. Research in Viticulture and Enology. (1-6; 1-6) Yr.
Mr. WINKLER, Mr. AMERINE, Mr. CASTOR, Mr. GUYMON, Mr. JACOB, Mr. OLMO, Mr. WILLIAMS

* Not to be given, 1946-1947.

IRRIGATION

100. Principles Underlying Irrigation in Its Soil and Plant Relationships. (3) II. Mr. VEIHMEYER
110. Development and Use of Farm Irrigation Water Supplies and Systems. (4) I. Mr. VEIHMEYER, Mr. DONEEN
120. Irrigation Hydraulics. (3) II. 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

LANGUAGES AND LITERATURE

English

- 1A. Composition. (3) I and II. Mr. FISHMAN, Mrs. WRIGHT
- 1B. Introduction to Literature. (3) I and II. Mr. FISHMAN, Mrs. WRIGHT
9. Directed Reading. (1-3) I and II. Mr. FISHMAN, Mrs. WRIGHT
- 46A-46B. Survey of English Literature. (3-3) Yr. Mr. FISHMAN

French

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

German

1. Elementary German. (4) I. Mr. FISHMAN
2. Elementary German. (4) II. Mr. FISHMAN

Spanish

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

MATHEMATICS

- C. Trigonometry. (3) I and II. Mr. G. A. BAKER, Mr. PATTEN, ———
- D. Intermediate Algebra. (3) I and II. Mr. G. A. BAKER, Mr. BURDETTE
1. College Algebra. (3) I. ———
- ‡3A-3B. Plane Analytic Geometry and Differential Calculus. (3-3) Yr.
Mr. ROESSLER
- 4A. Second Course in Calculus. (3) I. Mr. BURDETTE
- 4B. Third Course in Calculus. (3) II. Mr. BURDETTE
- *10. Spherical Trigonometry and Applications. (2) I. ———
- 11A-11B. Analytic Geometry and Calculus. (3-3) Yr. Mr. BURDETTE
- 105A-105B. Statistical Methods for Biologists. (2-2) Yr.
Mr. ROESSLER, Mr. G. A. BAKER
- 110A-110B. Advanced Calculus. (2-2) Yr. Mr. BURDETTE
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. ROESSLER in charge)

MECHANICAL ENGINEERING

151. Industrial Heat Transfer. (3) I. Mr. PERRY, Mr. F. A. BROOKS
152. Mass Transfer in Industrial Equipment. (3) II.
Mr. PERRY, Mr. F. A. BROOKS

MILITARY SCIENCE

5. First Course. (2) I. Mr. BUTTS
6. Second Course. (2) II. Mr. BUTTS
7. Third Course. (2) I. Mr. BUTTS
8. Fourth Course. (2) II. Mr. BUTTS
9. Military Leadership. (½) I and II. Mr. BUTTS
- 100A-100B. Advanced Infantry Training. (3-3) Yr. Mr. BUTTS

PHYSICAL EDUCATION

(Men)

1. Physical Training, Recreation, and Competitive Sports. (½-½) Yr.
Mr. TOOMEY, Mr. E. S. WILSON, Mr. SCHALL,
Mr. HICKEY, Mr. STROMGREN
33. First Aid. (½) I and II. The STAFF

‡ Students who do not meet the prerequisites of the course may demonstrate their fitness by passing an examination in these subjects.

* Not to be given, 1946-1947.

(Women)

26. Physical Education. ($\frac{1}{2}$) I and II. _____
33. First Aid. ($\frac{1}{2}$) I and II. The STAFF

PHYSICS

- 2A-2B. General Physics. (3-3) Yr. Mr. GARDNER
- 3A-3B. General Physics Laboratory. (1-1) Yr. Mr. GARDNER
- 4A. General Physics. (4) II. Mr. PATTEN
- *106. Atomic Structure and Structure of Matter. (3) II. Mr. GARDNER
116. Heat. (2) I. Mr. PATTEN
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF

PHYSIOLOGY

- 1A. Introductory Physiology. (3) I. _____
- 1c. Introductory Physiology Laboratory. (2) I. _____

PLANT NUTRITION

(For courses in Plant Nutrition, see Soil Science)

PLANT PATHOLOGY

120. Plant Diseases. (4) II. Mr. LEACH, Mr. HOUSTON
125. Diseases of Truck and Field Crops. (2) I.
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

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

POLITICAL SCIENCE

9. Elements of Government and Politics. (3) I. Mr. SHIDELEER
113. American Political Theory. (2) II. Mr. SHIDELEER

* Not to be given, 1946-1947.

*Agriculture***POMOLOGY**

(For courses in Pomology, see Horticulture)

POULTRY HUSBANDRY

1. Poultry Production. (3) II. Mr. ASMUNDSON
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

PSYCHOLOGY

- 1A. General Psychology. (3) II. _____

PUBLIC HEALTH

- 5A. Elementary Public Health. (3) II. _____

PUBLIC SPEAKING

- 1A. Elements of Public Speaking. (3) I and II. Mr. FISHMAN, Mrs. WRIGHT
- *1B. Principles and Types of Speech. (3) I and II. _____

SOIL SCIENCE

106. Elements of Soil Science. (4) II. Mr. L. E. DAVIS
110. The Soil as a Medium for Plant Growth. (4) I. Mr. CONRAD
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. CONRAD, Mr. L. E. DAVIS, Mr. VEIHMEYER

GRADUATE COURSE

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

SOIL TECHNOLOGY

(For courses in Soil Technology, see Soil Science)

SUBJECT A: ENGLISH COMPOSITION

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

TRUCK CROPS

1. Vegetable Production. (3) I and II. Mr. MACGILLIVRAY, Mr. HANNA
105. Systematic Olericulture. (3) I. Mr. RICK

* Not to be given, 1946-1947.

121. Vegetable Physiology. (3) II. Mr. O. A. LORENZ, Mr. MANN
 122. Advanced Truck Crops. (3) I. Mr. KNOTT, Mr. MORRIS
 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. O. A. LORENZ, Mr. MANN,
 Mr. MORRIS, 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. O. A. LORENZ, Mr. MACGILLIVRAY, Mr. MANN,
 Mr. MORRIS, Mr. RICK, Mr. P. G. SMITH

VETERINARY SCIENCE

111. Principles of Pathology and Control of Diseases of Domestic Animals.
 (3) II. Mr. H. S. CAMERON

GRADUATE COURSE

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

VITICULTURE

(For courses in Viticulture and Enology, see Horticulture)

ZOÖLOGY

- 1A. General Zoölogy. (5) I. Mr. STOREE, Mr. MILLER, Mr. ROSENBERG
 1B. Vertebrate Anatomy. (3) II. Mr. STOREE, Mr. MILLER
 1C. Vertebrate Embryology. (2) II. Mr. STOREE, Mr. ROSENBERG
 10. General Biology. (3) I. 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. STOREE, 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)

Agriculture

201A-201B. Research in Entomology. (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. BATCHELOR, Mr. CONDIT, Mr. PARKER

PLANT PATHOLOGY

201A-201B. Seminar in Plant Pathology. (1-1) Yr.

The STAFF (Mr. FAWCETT in charge)

230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr. Mr. FAWCETT

PLANT PHYSIOLOGY

203A-203B. Research in Plant Physiology. (1-6; 1-6) Yr.

Mr. BARTHOLOMEW, Mr. SINCLAIR

205A-205B. Seminar in Plant Physiology. (1-1) Yr.

The STAFF (Mr. BARTHOLOMEW 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. honoris causa (Freiburg), Sc.D. (San Marcos), 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.

ROBERT O. MOODY, B.S., M.D., Professor of Anatomy, Emeritus.

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

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

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

C. WILLET ASLING, M.D., Lecturer in Anatomy.

DOUGLAS G. CAMPBELL, M.D., Lecturer in Neuroanatomy.

*WEBB HAYMAKER, M.D., Lecturer in Neuroanatomy.

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 81.

Laboratory fees for nonmedical students are as follows: courses 102, 103, 199, \$6; 101, \$17.50; 105x, \$23; 212 (amount to be determined according to nature of work undertaken, maximum, \$11.50); 214, \$6-\$17.50. For the fees charged students in the Medical School, see the ANNOUNCEMENT OF THE MEDICAL SCHOOL.

UPPER DIVISION COURSES

101. Histology and Microscopic Organology. (6) I.

Miss SIMPSON (in charge), Mr. EVANS, Mr. KONEFF, Mr. LYONS

Three laboratory and 3 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. Fee, \$17.50. Enrollment limited.

102. General Human Anatomy. (3) II.

Mr. ASLING

Lectures and laboratory. Prerequisite: Zoölogy 1A or Physiology 1A, 1C. Fee, \$6. Enrollment limited to 200.

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. CAMPBELL

Lectures and laboratory. Fee, \$6. Enrollment limited to 12.

For certain nonmedical students only.

* Absent on leave, 1946-1947.

105. Systematic Human Anatomy. (5) I.
Mr. SAUNDERS (in charge), Mr. CAMPBELL, Mr. REINHARDT
Lectures. Prescribed for students in the first year of the Medical School.
Enrollment limited to 72. Course 105x must be taken concurrently.
- 105x. Systematic Human Anatomy. Laboratory. (6) I.
Mr. SAUNDERS (in charge), Mr. CAMPBELL, Mr. REINHARDT
Prescribed for students in the first year of the Medical School; must be
taken concurrently with course 105. Fee, \$23.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Fee, \$6. The STAFF (Mr. EVANS and Mr. SAUNDERS in charge)

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

209. Human Embryology. Credit to be arranged. I and II. Mr. EVANS
Opportunity is offered for the study of specific problems in human em-
bryology. 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. Fee to be determined according to
nature of work undertaken, maximum, \$11.50.
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. (1-5) I and II.
Mr. SAUNDERS and the STAFF
This course is offered in Berkeley and San Francisco. Laboratory fee
(if taken in Berkeley), \$6-\$17.50.

ANTHROPOLOGY

¹ EDWARD W. GIFFORD, Professor of Anthropology and Curator of the Anthropological Museum.

ROBERT H. LOWIE, Ph.D., Sc.D., Professor of Anthropology (Chairman of the Department).

RONALD L. OLSON, Ph.D., Professor of Anthropology.

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

THEODORE D. MCCOWN, Ph.D., Associate Professor of Anthropology and Associate Curator of Physical Anthropology.

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

ROBERT F. HEIZER, 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.

LILA M. O'NEALE, Ph.D., Associate Curator of Textiles and Professor of Decorative Art.

H. R. W. SMITH, Ph.D., Associate Curator of Classical Archaeology and Professor of Latin and Classical Archaeology.

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 81.

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

Preparation for the Major.—Required: Anthropology 1A-1B (8). Recommended: History 4A-4B; Near Eastern Languages 13A-13B, 25A-25B; Oriental Languages 42. 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 105, 153, either 181-182 or 101A-101B and other courses aggregating twelve upper division units in anthropology; with substitution permitted among these twelve, on approval by the department of some definite plan, up to six units in allied subjects, as suggested by the following list of courses: Classics 193, 194, 197; Geography 121, 122; Oriental Languages 172A; Paleontology 113; Philosophy 147; Public Health 163A; Near Eastern Languages 102A-102B; Social Institutions 101A-101B; Zoology 114. A comprehensive subject examination is required at the close of the senior year.

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

LOWER DIVISION COURSE

1A-1B. General Anthropology. (4-4) Yr.

Mr. OLSON

Either half may be taken independently.

I. Origin, antiquity, and races of man. II. Origin and growth of civilization.

¹ In residence fall semester only, 1946-1947

UPPER DIVISION COURSES

General prerequisite: course 1A-1B or junior standing.

- *101A-101B. *Ethnography of the World.* (3-3) Yr. Mr. LOWIE
102. *Chapters in Culture History.* (3) II. Mr. LOWIE
The topics considered will include economic life, primitive literature, and language.
105. *The American Indians.* (3) I. Mr. HEIZER
Development, spread, and attainments of culture.
106. *Archaeology of North America.* (3) II. Mr. HEIZER
Prehistory of North American Indians; prehistoric culture areas; relations with historic Indians.
111. *Prehistory.* (3) II. Mr. McCOWN
Prerequisite: course 1B.
Origin, development, and distribution in space and time of the prehistoric cultures of the Old World.
- *112. *Protohistoric Ethnography of Europe.* (3) I. Mr. McCOWN
Manners and customs; social and economic organization; art and religion of the prehistoric and protohistoric peoples of Europe.
115. *Peoples of the Philippines and Indonesia.* (3) I. Mr. GIFFORD
Geography, races, populations, cultures, and development of the Philippines, as part of the larger Indonesian sphere of world history.
- 118A-118B. *The Nature of Culture.* (3-3) Yr. Mr. MANDELBAUM
An examination of what culture is, how it functions and changes, and how it influences human beings. Primarily for major students in anthropology, psychology, geography, history, and social institutions.
- *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.
125. *Comparative Society.* (3) I. Mr. OLSON
The development of human society, with emphasis on the growth of modern institutions out of primitive kinship, social, and territorial units.
126. *Invention and Technology.* (3) II. Mr. GIFFORD
Psychology of invention; origin, history, and spread of fundamental inventions; illustrative material from the Museum of Anthropology.
137. *Indians of California.* (3) I. Mr. HEIZER
Origin and relationships of the natives; prehistoric remains; shell mounds. Tribal divisions; arts; customs; industries; beliefs.

* Not to be given, 1946-1947.

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. OLSON
 Culture of the Incas of Peru and of other Andean peoples.
- 143A. The Culture Sphere of India. (3) I. Mr. MANDELBAUM
 The culture of India and its radiations in Africa, southern Asia, and Indonesia.
- *147. Peoples and Culture of the Pacific Islands. (3) I. Mr. GIFFORD
 Oceanic races and cultures; indigenous origins; Asiatic relations and influences.
- 150A-150B. Physical Anthropology. (3-3) Yr. Mr. McCOWN
 Lecture and laboratory. Prerequisite: course 1A.
 Evolutionary development of man; anthropometry; analysis of data; criteria of race. Enrollment limited to 12; primarily for major students in anthropology and the medical sciences.
152. Fossil Man. (3) II. Mr. McCOWN
 Prerequisite: course 1A or Paleontology 1.
 Origin and relationships of the extinct forms of mankind.
153. Living Races of Man. (3) I. Mr. McCOWN
 Physical characters, distribution, and relationships of the living races of mankind.
160. Contemporary Civilization. (3) I. Mr. LOWIE
 An application of anthropological principles of analysis and interpretation to contemporary civilization.
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. Western and Northern 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 with instructor's consent.
- 198A-198B. Preceptorial and Reading Course. (2-2) Yr. Mr. MANDELBAUM, Mr. HEIZER
 Conferences with the preceptor. Systematic readings in the history of anthropology.
 Open to seniors.
- *199. Special Study for Advanced Undergraduates. (2-3) I and II. Mr. OLSON
 Open to seniors.

* Not to be given, 1946-1947.

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) II. 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) I. 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.

GRADUATE COURSES

206. Proseminar. (2) I and II. The STAFF (Mr. McCOWN in charge)
Introduction to research. For new graduate students in anthropology.
- 207A-207B. History and Theory of Anthropology. (2-2) Yr. Mr. LOWIE
- 209A-209B. Culture Problems of Eurasia and North America. (2-2) Yr.
Prerequisite: course 206. Mr. OLSON
244. Research. (2-6) I and II. The STAFF
279. Technological Analysis of Primitive Arts and Crafts. (2) I.
Miss O'NEALE
Designed primarily for students offering technology as a field of study. An introduction to various methods of working materials. Discussions, readings, analysis of museum specimens.

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 66,000 inventoried artifacts from native California, 42,000 from other parts of the New World, 33,000 from the Eastern Hemisphere, 6,000 skeletal items, 13,000 negatives. The collections are available for study by scholars and advanced graduate students. Those interested in the Museum's facilities may address the Curator, Mr. E. W. Gifford.

* Not to be given, 1946-1947.

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., Professor of Architecture (Chairman of the Department).
 WILLIAM C. HAYS, B.S., F.A.I.A., Professor of Architecture, Emeritus.
 MICHAEL B. GOODMAN, M.A., Associate Professor of Architecture.
 JACQUES SCHNIER, M.A., Assistant Professor of Modeling.
 HAROLD A. STUMP, A.B., Assistant Professor of Architecture.

- THOMAS F. CHACE, B.S., Lecturer in Architecture.
 JAMES GAYNER, Lecturer in Architecture.
 L. DEMING TILTON, B.S., Lecturer in Architecture and Political Science.

Letters and Science List.—Courses 5A, 5B, 5C, 14, 113, 114, 117A–117B, and 120A–120B are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Laboratory fee, \$3.50 in Architecture 114.

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, 114, 115 will be allowed up to a total of four units each, but in no semester will more than two units be allowed in any one of these courses. (Permission of instructor must be obtained to take more than one unit in any given semester.)

Students with junior standing will be allowed 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
 6 hours weekly. Lecture and drafting practice.
 Study of architectural forms and composition.
2. Architectural Drawing: Orthographic Projection. (3) I and II. Mr. STUMP, _____
 6 hours weekly. Lecture and drafting practice. Prerequisite: solid geometry.
3. Architectural Drawing: Shades and Shadows; Perspective. (3) I and II. Mr. STUMP, _____
 6 hours weekly. Lecture and drafting practice. Prerequisite: course 2.

4. Elementary Design and Theory. (4) I and II. Mr. JEANS
8 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) I. Mr. MOÏSE
- 5C. Architecture of the Renaissance. (2) II. Mr. PERRY
- *6A. Class Work in Ancient and Classic Architecture. (1) II. Mr. JORY
- 6B. Class Work in Medieval Architecture. (1) I. Mr. MOÏSE
- 6C. Class Work in Renaissance Architecture. (1) II. Mr. PERRY
12. Rendering in Water Color. (1) I and II. Mr. GOODMAN, ———
3 hours weekly. Sec. 1 (Goodman); Sec. 2 (———).
Prerequisite: Art 2A or equivalent.
13. Rendering in Pen and Ink. (1) I and II. Mr. JEANS, ———
3 hours weekly. Sec. 1 (Jeans); Sec. 2 (———).
Prerequisite: Art 2A or equivalent.
14. Elements of Sculpture. (2) I and II. Mr. SCHNIER
6 hours weekly. Two sections.
- 18A–18B. Introduction to Architecture. (1–1) Yr. Mr. PERRY, Mr. MOÏSE
18A is not prerequisite to 18B.
Lectures for beginning students in architecture; drafting practice.

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. GOODMAN, Mr. JORY
Prerequisite: courses 1, 2, 3, and 4.
10 hours weekly.
- 102A–102B. Design and Theory: Senior Problems. (5–5) Yr. Beginning each semester. 10 hours weekly. Mr. MOÏSE, ———
Prerequisite: course 101A–101B.
- †102C–102D. Design and Theory. (5–5) Yr. Beginning each semester.
Prerequisite: course 101A–101B. 10 hours weekly. Mr. MOÏSE, ———
- 108A–108B. Architectural Mechanics. (3–3) Yr. Mr. GAYNER
Prerequisite: Physics 1A–1B. Lectures.
110. The House. (1) I and II. Mr. GOODMAN, Mr. JEANS
112. Advanced Water Color Rendering. (1) I and II. Mr. JORY
3 hours weekly. Prerequisite: course 12 (3 units).
113. Sculptural Design. (2) I and II. Mr. SCHNIER
6 hours weekly. Prerequisite: course 14 (2 semesters), or courses 1 and 14 (1 semester).

* Not to be given, 1946–1947.

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

114. Modeling from Life. (2) I and II. Mr. SCHNIER
6 hours weekly. Prerequisite: course 14 (2 semesters) or junior standing. Fee, \$3.50.
115. Rendering in Pencil. (1) I and II. Mr. GOODMAN, Mr. JORY
3 hours weekly. Prerequisite: Architecture 13 (2 units).
- 117A. Introduction to Housing and Planning. (3) I and II. Mr. MOÏSE
Occasional seminars and field trips as arranged.
Prerequisite: senior standing.
- 117B. Problems in Housing and Planning. (3) I and II. Mr. MOÏSE
Additional conference hours as arranged.
Prerequisite: course 117A.
- 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, 117A 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 146.

200. Comprehensive Graduate Problem. (5) I. Mr. JEANS
12 hours weekly. A semester problem, including all phases of design, structure, and construction details. Given only in conjunction with Architecture 207.
- 201A. Design and Theory: Graduate Sketch Problems. (1) I and II.
Prerequisite: course 102A-102B. Mr. PERRY, Mr. MOÏSE
- 201B. Design and Theory: Graduate Problems. (7) I and II. Mr. PERRY
Prerequisite: course 101A-101B, and course 102A-102B with at least a grade of B.
202. Design and Theory: Advanced Problems and Research. (6) I and II.
Prerequisite: courses 200, 201A-201B, 207. Mr. PERRY
207. Architectural Engineering. (3) I. Mr. CHACE
This course is coördinated with course 200 and must be taken with it.
208. Seminar in Architecture. (3) I. 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 1A-1B or 4A.)
- Introduction to Mathematical Analysis. (Mathematics 3A, 3B, 4A.)
- Freehand Drawing. (Art 2A.)
- Strength of Materials. (Engineering 18A, 18B; Civil Engineering 108F.)
- Elements of Framed Structures. (Civil Engineering 112, 107E, 107F.)
- Plane Surveying. (Engineering 21.)

ART

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.

¹ RAY S. BOYNTON, Associate Professor of Art.

² JOHN C. HALEY, Associate Professor of Art.

² WALTHER A. HORN, Ph.D., Associate Professor of Art.

ERLE LORAN, Associate Professor of Art.

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

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

CHIURA OBATA, Assistant Professor of Art.

HENRY SCHAEFER-SIMMERN, Lecturer in Art and Education.

Laboratory Fees.—A fee of \$5 a semester will be charged in courses 102, 103, 104, 105, 110, 113, 199 and 298, if models are employed.

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 81.

Departmental Major Adviser: Mr. E. LORAN.

Preparation for the Major.—Six units chosen from Art 1A, 1B, 1C; and 2A-2B, 3A-3B.

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 a C average. Students who fail to maintain 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 and 12 units of any courses in Group A, B, or C.

Assignment to Sections.—Inasmuch as space and facilities for technical courses are limited, students are advised to enroll in Art 2A-2B, 3A-3B and in all Group A courses during the first three days of registration in room 102 Spreckels. 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.

¹ In residence fall semester only, 1946-1947.

² In residence spring semester only, 1946-1947.

Students who do qualify will sometimes be recommended to take Art 199 so as to acquaint them with the methods presupposed in this department's advanced courses.

LOWER DIVISION COURSES

- 1B. History of Medieval, Renaissance, and Modern Art—Emphasis on Painting. (3) II. Mr. RYDER
Lectures and section meetings monthly to be arranged.
- *1C. History of Medieval, Renaissance, and Modern Art—Emphasis on Architecture and Sculpture. (3) II. Mr. HORN
Lectures and weekly sections to be arranged.
- 2A-2B. Form. (2-2) Yr. Beginning each semester.
Mr. BOYNTON, Mr. HALEY, Mr. LORAN, Mr. NEUHAUS,
Mr. RYDER; Mr. BOYNTON, Mrs. O'HAGAN, Mr. WESSELS.
- 3A-3B. Form and Color. (2-2) Yr. Beginning each semester.
Mrs. O'HAGAN, Mr. LORAN, Mr. HALEY, Mr. WESSELS
Prerequisite: Art 2A-2B.
12. Freehand Basic Brushwork in Sumi Painting. (2) I and II. Mr. OBATA
19. The Appreciation of Art. (1) I. Mr. NEUHAUS

UPPER DIVISION COURSES

Group A: Appreciation and Practice

Prerequisite: Art 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 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) I. Mr. RYDER
Fee, \$5.
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. Mr. BOYNTON
Fee, \$5.
Water color, oil, pastel, and black and white media, using figure and costume models.

* Not to be given, 1946-1947.

104. Advanced Drawing and Painting. (2) II. Mr. HALEY
Fee, \$5.
105. Advanced Drawing and Painting. (2) I and II. Mr. LORAN
Fee, \$5.
110. Advanced Drawing and Painting. (2) I. Mrs. O'HAGAN
Fee, \$5.
Plastic organization of the picture, using still life and the human figure as models.
111. Advanced Drawing and Painting. (2) I. Mr. SCHAEFER-SIMMERN
112. Advanced Drawing and Painting. (2) I and II. Mr. OBATA
113. Advanced Drawing and Painting. (2) I and II. Mr. WESSELS
Fee, \$5.

Group B: Theory and Criticism

107. The Human Figure in Art, Past and Present. (2) II. Mr. RYDER
Prerequisite: Art 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.
168. Community Art. (2) II. Mr. NEUHAUS
Prerequisite: upper division standing.
173. The Architecture of Paintings. (2) I. Mr. RYDER
Prerequisite: Art 2A-2B.
Enrollment limited to 50 students.
- Aesthetics. (Philosophy 136A-136B.) (3-3) Yr. Mr. PEPPER
Prerequisite: six units of philosophy (at the discretion of the instructor may be waived for major students in literature and the fine arts).

Group C: History of Art and Archaeology

169. History of American Art. (3) II. Mr. NEUHAUS
Prerequisite: upper division standing.
- *175A-175B. Medieval Art. (3-3) Yr. Mr. HORN

SPECIAL STUDY COURSE

199. Special Study for Advanced Undergraduates. (1-4) I and II.
The STAFF (Mr. RYDER in charge)
Prerequisite: senior standing in art, with at least a B average in the major, and approval of the Department. Fee, \$5 if models are employed.
Credit gained in course 199 will be accepted in fulfillment of requirements in Groups A, B, or C.

* Not to be given. 1946-1947.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

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 precede 269A.

*285. Seminar in the History of Art. (2) II.

Mr. HORN

298. Special Study for Graduate Students. (2-6) I and II.

The STAFF (Mr. LORAN 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 semester for credit in this course. Fee, \$5 if models are employed.

* Not to be given, 1946-1947.

ASTRONOMY

STURLA EINARSSON, Ph.D., Professor of Astronomy (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., Assistant Professor of Astronomy.

LEON E. SALANAVE, A.B., Associate in Astronomy.

Letters and Science List.—All undergraduate courses in astronomy except courses 3 and 114 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Adviser: Mr. TRUMPLER.

Preparation for the Major.—Physics 1A-1B, 1C-1D, 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: Astronomy 104A-104B, 117A-117B, and twelve more units from the following courses: Astronomy 107, 108, 199, 206A-206B (open to properly qualified seniors); Mathematics 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. TRUMPLER
Three lectures and one section meeting weekly.
General facts and principles of the science of astronomy.

1B. Continuation of Course 1A. (3) I and II. Mr. MEYER, Mr. EINARSSON
Prerequisite: course 1A.

†2. Practice in Observing. (2) I and II. Mr. CUNNINGHAM
One lecture and three observing hours to be arranged.
Prerequisite: course 1A and plane trigonometry.
Elementary work with the equatorial telescope, transit, and sextant; descriptive observation of celestial objects; elementary determinations of time, latitude, and longitude; constellation study.

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

3. Surveyor's Course in Elementary Practical Astronomy. (1) I and II.
Lectures and laboratory. Mr. EINARSSON
Prerequisite: Engineering 1A.
Practical astronomy as applied to observations, with the surveyor's transit for determination of azimuth, latitude, and time.
- *6. Elementary Astronomy. (3) I and II. Mr. MEYER
A general course in the fundamental facts of astronomy, including the solar and stellar systems. Not open to those who have had 1A, and will not be accepted in partial satisfaction of the prescribed science requirement for the degree of Associate in Arts.
- 7A-7B. General Astronomy. (3-3) Yr. Mr. MEYER, Mr. CUNNINGHAM
Prerequisite: trigonometry and analytical geometry. Intended for majors in the natural sciences and engineering.
The facts and principles underlying all branches of astronomy. Required in preparation for a major in astronomy.
9. Navigation. (2) I and II. Mr. MEYER, Mr. EINARSSON
Prerequisite: plane trigonometry.
Instruments for determining direction and distance. Piloting and the sailings.
10. Nautical Astronomy. (2) I and II. Mr. EINARSSON, Mr. MEYER
Prerequisite: plane trigonometry.
The theory of determination of lines of position from observations of sun, moon, planets, or stars.
NOTE.—Courses 9, 10, 109, and 110 are a sequence giving the student a general practical knowledge of the fundamental principles of astronomy underlying the navigation of ships and aircraft: piloting, the sailings, use of sextant, chronometer, compass, almanacs, tables, determination of latitude, time, longitude, and azimuth. Astronomy 109 and 110 are laboratory courses.

UPPER DIVISION COURSES

A working knowledge of differential and integral calculus is prerequisite to courses 107 and 108.

- 104A-104B. Practical Astronomy. (3-3) Yr. Mr. TRUMPLER
Prerequisite: Mathematics 3A-3B, Physics 1A-1B, and either Astronomy 1A-1B or 7A-7B. Astronomy 107 is recommended and may be taken concurrently with 104A.
107. Method of Least Squares. (2) I. Mr. EINARSSON
Adjustment of observations with applications to astronomy, plane and geodetic surveying.
108. Interpolation, Numerical Differentiation and Integration. (3) II.
Mr. MEYER
109. Nautical Astronomy. (2) II. Mr. EINARSSON, Mr. SALANAVE
Prerequisite: Astronomy 10.
Theory and practice. Sextant observations of celestial objects for determination of position.
Limited to twenty-four students.

* Not to be given, 1946-1947.

- †110. Navigation and Nautical Astronomy. (2) II.
Prerequisite: Astronomy 10. Mr. EINARSSON, Mr. SALANAVE
Magnetic compass. Causes of compass error. Theory and practice of
compensation. Elements of gyrocompass.
Limited to twenty-four students.
114. Practical Astronomy for Engineers. (3) I.
Mr. EINARSSON, Mr. SALANAVE
Lectures, computing, and two hours of astronomical observation.
Prerequisite: Astronomy 3 and plane surveying (Engineering 1A-1B).
Precise determination of latitude, time and longitude.
- 117A-117B. Introduction to Astrophysics. (3-3) Yr. _____
A laboratory period will occasionally be substituted by appointment for
one of the regular periods.
Prerequisite: Astronomy 7A-7B or consent of 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 146.

Course 206A is prerequisite to course 210A-210B, and 212.

- 206A-206B. Theoretical Astronomy. (3-3) Yr. Mr. CUNNINGHAM
Various orbit methods. Special perturbations.
Prerequisite to 206B: course 108. (108 and 206B may be taken concur-
rently.)
- 208A-208B. Introduction to Celestial Mechanics. (3-3) Yr. Mr. CUNNINGHAM
- *210A-210B. The General Perturbations of the Minor Planets after Hansen,
Newcomb and Hill. (3-3) Yr. _____
- *212. Satellite Theory. (3) II. _____
215. Advanced Study and Research. I and II. Credit by special arrangement.
The STAFF (Mr. TRUMPLER in charge)
- 217A-217B. Astrophysics. (3-3) Yr. _____
Prerequisite: Astronomy 117A-117B.
- 218A-218B. Statistical Astronomy. (3-3) Yr. Mr. TRUMPLER
- *227A-227B. Advanced Astrophysics. (3-3) Yr. _____
Detailed development of certain more advanced problems of astro-
physics. Designed for graduate students whose special field is astrophysics.

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

* Not to be given, 1946-1947.

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.

COURSES IN OTHER DEPARTMENTS

Higher Surveying and Geodesy. (Civil Engineering 105.)

Differential Equations. (Mathematics 119A-119B, 220A-220B.)

Theory of Probability. (Mathematics 120A-120B.)

Functions of a Complex Variable. (Mathematics 200A-200B.)

Advanced Dynamics. (Physics 205A-205B.)

Spectroscopy. (Physics 211A-211B.)

BACTERIOLOGY

A. P. KRUEGER, A.B., M.D., Professor of Bacteriology (Chairman of the Department).

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

SANFORD S. ELBERG, Ph.D., Assistant Professor of Bacteriology.

RUTH MOSER CHESBRO, M.A., Associate in Bacteriology.

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

MAYNARD A. JOSLYN, Ph.D., Associate Professor of Food Technology.

Letters and Science List.—All undergraduate courses in bacteriology are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Advisers: Mr. A. P. KRUEGER, Mr. S. S. ELBERG.

Preparation for the Major.—Courses required to be taken in the following order: Chemistry 1A-1B, 5 and 8, Zoölogy 1A, Physics 2A, 2B, Botany 12, Bacteriology 1, 4; French or German. Recommended: Chemistry 9, Economics 1A-1B, Physiology 1A, 1C, Home Economics 1A-1B, Public Health 5A-5B, 104A-104B, Zoölogy 4, 100, 110.

The Major.—Required: Bacteriology 101 (6), 199 (2) completed with a minimum grade of C; and 16 units (also completed with a minimum grade of C), chosen from one of the following groups:

I. Emphasis on Public Health and Medical Bacteriology: Anatomy 101 (6), Bacteriology 103 (2), Biochemistry 101M (8) or 103 (4) and 104 (4), 110 (5), Civil Engineering 124 (3), Entomology 126 (4), Public Health 164A (3), 164B (4), 147A (3), 147B (4), 151 (8), 152 (3), Zoölogy 110 (4), 111 (4).

II. Emphasis on Parasitology and General Biology: Bacteriology 103 (2), Biochemistry 103 (4) and 104 (4), Botany 101 (3), 102 (3), 122 (2), and 123 (2), Chemistry 109 (3), Entomology 126 (4), Plant Pathology 120 (4), Zoölogy 108 (3), 111 (4), 117A or 117B (2), Food Technology 116 (4).

III. Emphasis on Technical Microbiology: Bacteriology 103 (2), Biochemistry 103 (4), 104 (4), 110 (5), Botany 120A (2), 120B (2), 121A (2), 121B (2), 122 (2) and 123 (2), Food Technology 112A (3) or 112B (3) or 116 (4), Home Economics 100 (3), 101A (3), 106 (3).

IV. Emphasis on Bacterial Metabolism: Bacteriology 103 (2), Biochemistry 103 (4), 104 (4), Botany 120A (2), 120B (2), 121A (2), 121B (2), Chemistry 100 (4), 101 (3), 102 (3), 103 (3), 109 (3), Zoölogy 101 (2), 101c (2), Food Technology 116.

V. Emphasis on Immunology: Anatomy 101 (6), Biochemistry 103 (4), 104 (4), Chemistry 100 (4), 109 (3), 111, 111H (3), 118 (2), Zoölogy 100 (3), 111 (4).

Honor Students.—Honors are recommended for candidates who maintain a grade-point average of 2.5 in at least the minimum for the major in bacteriology and in other biological subjects.

Laboratory fees are as follows: courses 1, 2, \$14.50; 101, \$34.50; 199, \$17.50 (if laboratory).

LOWER DIVISION COURSES

1. General Introductory Bacteriology and Microbiology. (5) II.
Lectures and laboratory. Mr. DOUDOROFF, Mrs. CHESBRO
Prerequisites: Chemistry 1A and 8; a semester course in botany, zoölogy,
or physiology (Botany 1A or 12; Zoölogy 1A or 10; Physiology 1A) with
at least a grade of C in each course. Fee, \$14.50.
A general introduction to microbiology required of students majoring
in bacteriology and other students intending to do further work in micro-
biology.
2. General Bacteriology. (4) II. Mr. KRUEGER, Mr. ELBERG, Mrs. CHESBRO
Lectures and laboratory.
Prerequisite: Chemistry 1A.
Designed especially for students who are not majoring in bacteriology.
It is acceptable as a prerequisite for Bacteriology 101. Fee, \$14.50.

UPPER DIVISION COURSES

A grade of B or higher in the preceding courses in this department is required
for admission to the upper division courses.

101. Advanced Bacteriology. (6) I. Mr. KRUEGER, Mrs. CHESBRO, Mr. ELBERG
Enrollment limited to fifty students who will be selected on the basis of
scholastic standing, major field, and year of residence.
Lectures, demonstrations, and laboratory. Fee, \$34.50.
103. Microbial Metabolism. (2) II. Mr. JOSLYN
Prerequisite: courses 1 and 2, Biochemistry 103 or Botany 122.
199. Special Study for Advanced Undergraduates. (2-4) I and II.
Mr. KRUEGER, Mr. DOUDOROFF, Mr. ELBERG
Fee, \$17.50 (if laboratory work is included).

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

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. JOSLYN
205. Seminar. (1) I and II. The STAFF (Mr. KRUEGER, Mr. BARKER)

BIOCHEMISTRY

A Division of the Medical School

DAVID M. GREENBERG, Ph.D., Professor of Biochemistry (Chairman of the Division).

PAUL L. KIRK, Ph.D., Professor of Biochemistry.

EDWARD S. SUNDESTROEM, M.D., Professor of Biochemistry.

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

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

¹ HAMILTON H. ANDERSON, M.D., Professor of Pharmacology.

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

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 81.

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 or 1A-1B, and 1C-1D; Physiology 1A, 1C or Zoölogy 1A-1B. Recommended: Chemistry 9, 107, 109; Bacteriology 1, 4; Botany 12.

The Major.—The major must include Biochemistry 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 Biochemistry 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, and 109 or 110A-110B; Physics 2A-2B, 3A-3B or 1A-1B, and 1C-1D; Mathematics 11A-11B or 3A-3B, 4A; Physiology 1A, 1C or Zoölogy 1A-1B; a reading knowledge of German. Recommended: Bacteriology 1 and 4; Botany 12; and a course in statistics.

The Major.—The major consists of 24 units of upper division courses in biochemistry and allied subjects taken in accordance with a plan approved by the departmental adviser. Normally at least 20 units of the major must be in courses in biochemistry and must include Biochemistry 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.

¹ In residence fall semester only, 1946-1947.

Laboratory fees for nonmedical students are as follows: course 104, \$23; 106A-106B, 107, 108, \$11.50; 110, \$14; 180, \$17.50. For the fees charged students in the Medical School, see the ANNOUNCEMENT OF THE MEDICAL SCHOOL.

UPPER DIVISION COURSES

101M. Animal Biochemistry. (8) II.

Mr. GREENBERG, Mr. ALLEN, Mr. KIRK, Mr. TARVER, and Assistants
Lectures and laboratory.

Prescribed for students in the first year of the Medical School.

For medical students the prerequisites are as prescribed for the Medical School.

Lectures on the 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.

Laboratory practice in routine biochemical procedures including urine and blood analysis.

This course fulfills the requirements of the Medical School in biochemistry. Lectures and laboratory work may be taken separately by nonmedical students; lectures as 103; laboratory as 104; see below.

NOTE.—Biochemistry 103 (4) and 104 (4) are given simultaneously with Biochemistry 101M (8). They include the subject matter of the latter course.

103. Animal Biochemistry. Lectures only. (4) II.

Mr. GREENBERG, Mr. ALLEN, Mr. KIRK, Mr. TARVER

Prerequisite: Chemistry 8 with grade C or higher. Recommended: Chemistry 5, Zoölogy 1A-1B or Physiology 1A, 1C, Anatomy 102.

This course covers the lecture work given in Biochemistry 101M.

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

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

Mr. GREENBERG, Mr. ALLEN, and Assistants

Prerequisite: course 103, completed or in progress and Chemistry 5 or Home Economics 101A, with grade C or higher. Laboratory fee, \$23.

This course covers the laboratory work given in Biochemistry 101M.

105A. The Chemistry of the Proteins. (3) I.

Mr. TARVER

Prerequisite: Chemistry 8 with grade C or higher. Recommended: Chemistry 109.

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 Oxidations. (3) II.

Mr. GREENBERG

Prerequisite: Biochemistry 105A with grade C or higher. Recommended: Chemistry 109 and Biochemistry 105A.

Historical development, classification, sources, methods of purification, and general properties of enzymes and enzymic systems and their role in life processes.

- 106A. Protein Chemistry Laboratory. (2) I. Mr. TARVER
Open to students who are taking or who have taken Biochemistry 105A with grade C or higher. Laboratory fee, \$11.50.
The preparation and isolation of amino acids and proteins. Methods of analysis, physicochemical properties, and behavior.
- 106B. Enzyme Chemistry Laboratory. (2) II. Mr. GREENBERG
Open to students who are taking or who have taken Biochemistry 105B with grade C or higher. Laboratory fee, \$11.50.
Experimental methods of enzyme chemistry and biological oxidations.
107. Quantitative Microchemical Analysis. (4) I. Mr. KIRK
Lecture and laboratory. Laboratory fee, \$11.50.
Prerequisite: Chemistry 5 and 8 with grade C or higher. Enrollment limited to twenty-five. Permission of instructor must be obtained before enrollment.
Quantitative estimation of elements and compounds on a micro basis with particular reference to biological materials.
108. Qualitative Microchemical Analysis. (3-5) I. Mr. KIRK
Lecture and laboratory. Fee, \$11.50.
Prerequisite: Chemistry 5 and 8 with grade C or higher. Enrollment limited to twenty-five. Permission of instructor must be obtained before enrollment.
Application of chemical microscopy and microqualitative methods to inorganic and organic substances. Criminological testing methods.
110. Quantitative Medical Biochemistry. (5) I. Mr. SUNDSTROEM
Lectures and laboratory.
Prerequisite: Biochemistry 101M, or 103 and 104, with grade C or higher. Fee, \$14.
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: Biochemistry 101M, or 103 and 104, with grade C or higher.
Biochemical literature and newer developments of the subject.
115. The Mechanism of Drug Action. (3) I. Mr. ANDERSON
(Formerly numbered 109.)
Prerequisite: Biochemistry 103 with grade C or higher. Recommended: Physiology 100A-100B or 111.
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
(Given at the Medical Center in San Francisco.)
Prerequisite: Biochemistry 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. Fee, \$17.50.
 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 146.

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.

COURSES IN OTHER DEPARTMENTS

- Anatomy 101 (6), 102 (3).
- Bacteriology 101 (6), 103 (2).
- Botany 122 (2), 123 (2).
- Chemistry 100 (4), 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

- JAMES T. BARRETT, Ph.D., Professor of Plant Pathology.
 LEE BONAR, Ph.D., Professor of Botany and Curator of Mycological Collections.
 ALVA R. DAVIS, Ph.D., Professor of Plant Physiology (Chairman of the Department).
 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.
 WILLIS L. JEPSON, Ph.D., LL.D., Professor of Botany, Emeritus.
 HOWARD S. REED, Ph.D., Professor of Plant Physiology, Emeritus.
 LINCOLN CONSTANCE, Ph.D., Associate Professor of Botany and Curator of Seed Plant Collections.
 RALPH EMERSON, Ph.D., Assistant Professor of Botany.
 GEORGE F. PAPPENFUSS, Ph.D., Assistant Professor of Botany and Curator of Algal Collections.
 LEONARD MACHLIS, Ph.D., Instructor in Plant Physiology.

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- JAMES P. BENNETT, Ph.D., Professor of Plant Physiology.
 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.
 WILLIAM Z. HASSID, Ph.D., Associate Professor of Plant Nutrition.
 EMIL M. MRÁK, Ph.D., Associate Professor of Food Technology.
 SPENCER W. BROWN, Ph.D., Instructor in Genetics.

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 81.

Departmental Major Adviser: Mr. BONAR.

Preparation for the Major.—Required: Botany 1A-1B (or 12 and 1B), 15, 16, and Chemistry 1A, 8. Recommended: German and one other foreign language; elementary courses in other biological sciences. If the lower division program is crowded, the student may postpone Chemistry 8 until he reaches the upper division, provided it is taken before Botany 120A, 122, 123.

The Major.—Botany 101 (3) or 102 (3), 105 (4), 110A-110B (6), 120A (2), 120B (2), 121A (2) or 121B (2), 130 (4) and 4 units to be selected from the announced list of related courses.

Laboratory Fees.—A laboratory fee of \$2.50 is charged in course 12; \$4.50 a semester in 1A-1B; \$6 a semester in 15, 16, 101, 102, 105, 107, 108, 110A-110B, 130, 131, 155; \$11.50 a semester in 121A-121B and 123.

LOWER DIVISION COURSES

- 1A-1B. General Botany. (4-4) Yr. Mr. CONSTANCE, Mr. BONAR
A survey of fundamental biological facts and principles as illustrated
by plants.
Lectures and laboratory. Fee, \$4.50.
12. Introduction to Structure and Function of Plants. (4) I and II.
Mr. PAPANFUSS, Mr. EMERSON
Lectures and demonstration periods. Not open for credit to students
who have had Botany 1A or 1B; open to upper division and graduate stu-
dents by permission of instructor only. Fee, \$2.50.
Designed primarily for students who desire a general acquaintance with
the fundamentals of botany. Accepted in lieu of Botany 1A-1B as one of the
prerequisites for further work in botany.
15. Comparative Morphology of Algae and Bryophyta. (3) II.
Lecture and laboratory. Mr. BONAR, Mr. PAPANFUSS
Prerequisite: Botany 1A-1B or 12. Fee, \$6.
16. Comparative Morphology of Vascular Plants. (3) I. Mr. FOSTER
Lecture and laboratory.
Prerequisite: Botany 1A-1B, or 12. Fee, \$6.

RELATED COURSES IN OTHER DEPARTMENTS

Introductory Paleobotany. (Paleontology 3.)

General Bacteriology and Microbiology. (Bacteriology 2.)

UPPER DIVISION COURSES

In addition to requirements specifically noted, prerequisites for all upper division courses in botany (excepting Botany 122-123 for which they may be waived with permission of instructor) include the following alternatives: (a) Botany 1A-1B; (b) Botany 12, plus 1B; (c) Botany 12, plus 16. Students anticipating future enrollment in Botany 101-102 should select alternatives (a) or (b).

Morphology and Taxonomy

101. Mycology. (3) II. Mr. EMERSON, Mr. SNYDER
Lecture and laboratory. Fee, \$6.
Morphology, taxonomy, and parasitism of representative genera of the
fungi. Phycomycetes and Ascomycetes.
102. Mycology. (3) I. Mr. BONAR
Lecture and laboratory. Fee, \$6. Course 101 recommended, but not pre-
requisite.
Continuation of Botany 101. Fungi Imperfecti and Basidiomycetes.

105. Plant Anatomy. (4) II. Mr. FOSTER
Lecture and laboratory. Fee, \$6.
Prerequisite: Botany 16. Permission of the instructor must be obtained before enrollment.
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. PAPERFUSS
Lectures and laboratory. Fee, \$6.
Prerequisite: course 15 or its equivalent.
Advanced morphology and taxonomy of algae.
108. Taxonomy of Flowering Plants. (3) II. Mr. CONSTANCE
Fee, \$6.
- 110A-110B. Systematic Botany of Spermatophytes. (3-3) Yr. Mr. MASON
Lectures and laboratory. Fee, \$6 a semester.
Botany 110A is prerequisite to 110B.

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

- 120A. Plant Physiology. (2) I. Mr. DAVIS
Prerequisite: Chemistry 1A and Chemistry 8 or its equivalent.
Recommended: Chemistry 5, Botany 122 and Soil Science 110. If possible Botany 121A should be taken concurrently.
- 120B. Plant Physiology. (2) II. Mr. DAVIS
Prerequisite: Botany 120A. If possible Botany 121B should be taken concurrently.
A continuation of Botany 120A.
- 121A-121B. Plant Physiology. Laboratory. (2-2) Yr.
Fee, \$11.50 a semester. Mr. DAVIS, Mr. MACHLIS
To accompany course 120A-120B.
Prerequisite: Chemistry 8; Botany 120A for 121A; 120A-120B for 121B.
The lectures should be taken concurrently. 121A is not prerequisite to 121B.
Recommended: Chemistry 5, Botany 105, 122, 123.

122. Plant Biochemistry. (2) I. Mr. HOAGLAND
Prerequisite: Chemistry 8. Whenever possible, Botany 123 should be taken concurrently.
123. Plant Biochemistry. Laboratory. (2) I. Mr. HASSID
Prerequisite: Botany 122 (concurrently), Chemistry 5, 8. Fee, \$11.50.
- *124. Lectures in Advanced Plant Physiology. (2) I. —————
Prerequisite: Botany 120A-120B, or equivalent.

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. Anatomy and Physiology of the Cell. (4) I. Mr. GOODSPEED
Lecture and laboratory.
131. Plant Cytogenetics. (2) II. Mr. BROWN
Laboratory: 6 hours to be arranged. Fee, \$6.
Prerequisite: Botany 130, Genetics 100 and 101. (Genetics 101 may be taken concurrently.)
Cytological aspects of genetical phenomena.

RELATED COURSES IN OTHER DEPARTMENTS

- Principles of Genetics. (Agriculture: Genetics 100.)
Cytogenetics. (Agriculture: Genetics 101.)
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.)
Heredity and Evolution. (Zoölogy 114.)
Methods of Biological Investigation with Optical Instruments of Precision. (Zoölogy 119A-119B.)

* Not to be given, 1946-1947.

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. FOSTER, Mr. GOODSPEED
Prerequisite: Botany 105 and 130 or their equivalents. Permission of the instructor is required. Fee, \$6.
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 senior students 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 117A-117B.)
- Geography of Domesticated Plants and Animals. (Geography 161.)

GRADUATE COURSES

See page 146 of this Catalogue concerning conditions for admission to graduate courses.

- 201A-201B. Research. Yr. The STAFF (Mr. FOSTER in charge)
Original investigations of special problems in the field, laboratory, herbarium, or botanical garden. Credit according to the work accomplished.
203. Seminar in Plant Physiology. (1) II. Mr. DAVIS
204. Seminar in Plant Cytology. (1) II. Mr. GOODSPEED
- 205A. Seminar in Morphology and Taxonomy of Vascular Plants. (1) I.
Mr. MASON, Mr. FOSTER, Mr. CONSTANCE

BUSINESS ADMINISTRATION

- IRA B. CROSS, Ph.D., Professor of Economics on the Flood Foundation.
 STUART DAGGETT, Ph.D., Professor of Transportation on the Flood Foundation.
- MALCOLM M. DAVISSON, J.D., Ph.D., Professor of Economics.
 EWALD T. GREYER, Ph.D., Professor of Economics on the Flood Foundation
 (Chairman of the Department).
- 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.
- ROBERT A. GORDON, Ph.D., Associate Professor of Economics.
 CLARK KERR, Ph.D., Associate Professor of Industrial Relations.
 ROYAL A. ROBERTS, M.B.A., Associate Professor of Business Administration.
 CHARLES C. STAEBLING, M.S., C.P.A., Associate Professor of Accounting.
 LEONARD A. DOYLE, Ph.D., C.P.A., Assistant Professor of Accounting.
 FRANK L. KIDNER, Ph.D., Assistant Professor of Economics.
 CATHARINE DE MOTTE QUIRE, Ph.D., Assistant Professor of Accounting.
 F. THEODORE MALM, Ph.D., Instructor in Business Administration.

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- JOHN P. CARTER, A.B., Lecturer in Business Administration.
 REGINALD H. LINFORTH, J.D., Lecturer in Commercial Law.
 OLOF LUNDBERG, C.P.A., Lecturer in Accounting.
 WILLIAM K. SCHMELZLE, B.S., M.B.A., Lecturer in Business Administration.
 LAWRENCE L. VANCE, M.A., C.P.A., Lecturer in Accounting.
 PAUL F. WENDT, Ph.D., Lecturer in Finance.
 DAVID GORDON TYNDALL, M.A., Associate in Business Administration.

The requirements for the curriculum in the School of Business Administration are listed on page 116.

Letters and Science List.—Business Administration 10 is included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

LOWER DIVISION COURSES

6A-6B. Principles of Accounting. (3-3) Yr. Beginning each semester.

Mr. MASON, Mr. VANCE

Prerequisite: at least sophomore standing. 6A is a prerequisite to 6B. Two lectures and one two-hour laboratory section weekly to be arranged.

6A. I: (Mason). II: (Vance).

6B. I: (Vance). II: Sec. 1 (Mason); Sec. 2 (Mason), for economics and engineering students, no laboratory is required.

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
Prerequisite: open to sophomore students in all departments of the University except those who have taken or who are planning to take Business Administration 6A-6B.
A survey of accounting principles and procedures, particularly as they affect the individual.
18. Commercial Law. (3) I and II. Mr. LINFORTH, ———
Prerequisite: at least sophomore standing. Prescribed for students in the School of Business Administration.
Sec. 1 (Linforth); Sec. 2 (———).

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. CARTER, Mr. DAVISSON, Mr. DOYLE, Mr. MALM,
Mr. TYNDALL, Mr. WENDT
I: Sec. 1 (———); Sec. 2 (Davisson); Sec. 3 (Doyle); Sec. 4 (Tyndall); Sec. 5 (Carter); Sec. 6 (Carter); Sec. 7 (Wendt).
II: Sec. 1 (———); Sec. 2 (Doyle); Sec. 3 (Carter); Sec. 4 (Carter); Sec. 5 (Tyndall); Sec. 6 (Wendt).
Not open to students taking Economics 100A. Primarily for juniors.
108. Business Fluctuations and Forecasting. (3) I and II.
Mr. CARTER, Mr. GORDON, Mr. MALM, Mr. TYNDALL
I: Sec. 1 (Gordon); Sec. 2 (Malm); Sec. 3 (Tyndall); Sec. 4 (Tyndall); Sec. 5 (Carter).
II: Sec. 1 (Gordon); Sec. 2 (Carter); Sec. 3 (Carter); Sec. 4 (Tyndall); Sec. 5 (Malm).
Not open to students who have taken Economics 103.
Prerequisite: Business Administration 107.
118. Advanced Commercial Law. (3) I and II. ———
Primarily for upper division students in the School of Business Administration, but 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. MALM, Mr. SCHMELZLE
Sec. 1 (Schmelzle); Sec. 2 (Malm).
121. Management Problems and Policies. (2) II. Mr. SCHMELZLE
Prerequisite: senior standing and Business Administration 107, 120, and 123. Recommended: Business Administration 134 and 151.
123. Marketing. (3) I and II. Mr. GRETHER, Mr. ROBERTS
I: Sec. 1 (Grether); Sec. 2 (Roberts). II: (Grether).
- 124A-124B. Retail Store Management. (3-3) Yr. Mr. ROBERTS
125. Advertising. (3) I and II. ———
126. Sales Analysis and Sales Management. (3) I. Mr. ROBERTS
Prerequisite: Business Administration 123.

127. Production Planning and Control. (3) I. Mr. SCHEMELZLE
128. Industrial Procurement. (3) II. Mr. ROBERTS
133. Investments. (3) I. Mr. WENDT
134. Corporation Finance. (3) I and II. Mr. STAEHLING, Mr. WENDT
 I: Sec. 1 (Wendt); Sec. 2 (Staebling).
 II: Sec. 1 (Wendt); Sec. 2 (Staebling).
 Sec. 2 open only to those students who have completed Business Administration 160B.
 Prerequisite: Business Administration 6A-6B.
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. KERR
 Students will not receive credit for both Economics 150A and Business Administration 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: Business Administration 151 or Economics 150A.
154. Collective Bargaining Systems. (3) I. Mr. KERR
 Prerequisite: Business Administration 151 or Economics 150A.
 Collective bargaining systems in American industries such as steel, automobile, coal, clothing. Labor agreements, conciliation, mediation, and arbitration of labor disputes.
155. Labor Law and Legislation. (3) II. Mr. DAVISSON
 Prerequisite: Business Administration 151 or Economics 150A and Business Administration 154.
 The National Labor Relations Act, Fair Labor Standards Act, Social Security Law, and other important legislation affecting management and labor. Basic Supreme Court cases on picketing, boycotting, etc., and the rights and duties of organized labor and employers.
- 160A-160B. Advanced Accounting. (3-3) Yr. Mr. DOYLE, Mr. STAEHLING
 160A. I: (Staebling). II: (Doyle).
 160B. I: (Doyle). II: (Staebling).
 A two-hour laboratory period to be arranged. Prerequisite: Business Administration 6A-6B, with average grade not lower than C. Business Administration 160A with at least a C average is prerequisite to 160B.

161. Cost Accounting. (3) I and II. Mr. DOYLE, Mr. VANCE
 I: (Doyle); II: (Vance).
 Prerequisite: Business Administration 6A-6B, with an average grade not lower than C; 160A is recommended.
162. Auditing. (3) I and II. Mr. VANCE
 Prerequisite: Business Administration 6A-6B, 160A.
163. Budgetary Control and Accounting Systems. (3) I. Mr. VANCE
 Prerequisite: Business Administration 6A-6B, 160A-160B, 161.
164. Governmental and Institutional Accounting. (2) I and II. Mr. LUNDBERG
 Prerequisite: Business Administration 6A-6B, 160A-160B, or consent of the instructor.
166. Analysis of Financial Statements. (3) II. Mr. STAEHLING
 Prerequisite: Business Administration 6A-6B, 160A-160B with at least a C average.
174. Traffic Management. (3) I and II. Mr. DAGGETT
- 198A-198B. Directed Group Study. (1-3; 1-3) Yr.
 The STAFF (Mr. GREYER in charge)
- 199A-199B. Special Study for Advanced Undergraduates. (1-3; 1-3) Yr.
 The STAFF (Mr. GREYER in charge)

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

221. Seminar in Business Policy. (3) I and II. Mr. SCHMELZLE
- 223A-223B. Seminar in Marketing. (3-3) Yr. Mr. GREYER
226. Advanced Marketing. (3) II. Mr. ROBERTS
 Prerequisite: Business Administration 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) II. Mr. WENDT
236. Seminar in Money and Credit. (3) II. Mr. CROSS
 Prerequisite: Business Administration 136 and Economics 135.
242. Business Investigations and Analysis. (3) II. Mr. KIDNER
251. Seminar in Industrial Relations. (3) II. Mr. KERR
- 260A-260B. Seminar in Accounting Theory. (2-2) Yr. Mr. MASON
 Prerequisite: graduate standing and Business Administration 160A-160B.

- 261A-261B. Public Accounting Problems. (3-3) Yr.
I: 261A (Staebling). II: 261B (Doyle). Mr. DOYLE, Mr. STAEHLING
Prerequisite: Business Administration 160A-160B, 161.
Advanced accounting problems.
- *264. Specialized Accounts. (2) I. Mr. VANCE
269. Income Tax Procedure. (3) I. Mr. MASON
Prerequisite: Business Administration 160A-160B.
A study of the Federal and California laws relating to personal, estate,
and corporation income taxes, from the accounting point of view, includ-
ing a brief survey of social security, gift, and estate taxes.
- 270A. Seminar in Transportation. (2) I. Mr. DAGGETT
297. Research in Business Problems. (1-6) I and II.
The STAFF (Mr. GREYER in charge)
Primarily for candidates for the degree of Master of Business Admin-
tration.

* Not to be given, 1946-1947.

CHEMISTRY

- GERALD E. K. BRANCH, 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.
*CHARLES W. PORTER, Ph.D., Professor of Chemistry.
GERHARD K. ROLLEFSON, Ph.D., Professor of Chemistry and Director of the Laboratories.
PHILIP W. SCHUTZ, 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.
MERLE RANDALL, Ph.D., Professor of Chemistry, Emeritus.
MELVIN CALVIN, Ph.D., Associate Professor of Chemistry.
LEO BREWER, Ph.D., Assistant Professor of Chemistry.
JAMES CASON, Ph.D., Assistant Professor of Chemistry.
ROBERT E. CONNICK, Ph.D., Assistant Professor of Chemistry.
SPOFFORD G. ENGLISH, Ph.D., Assistant Professor of Chemistry.
WILLIAM D. GWINN, Ph.D., Assistant Professor of Chemistry.
GEORGE JURA, Ph.D., Assistant Professor of Chemistry.
EDWIN F. ORLEMANN, Ph.D., Assistant Professor of Chemistry.
RICHARD E. POWELL, Ph.D., Assistant Professor of Chemistry.
WILLIAM G. DAUBEN, Ph.D., Instructor in Chemistry.
JACK W. PETERSEN, Ph.D., Instructor in Chemistry.
HENRY RAPOPORT, Ph.D., Instructor in Chemistry.
WILLIAM SHAND, JR., Ph.D., Instructor in Chemistry.
CHARLES R. WILKE, Ph.D., Instructor in Chemistry.
BRUNO H. ZIMM, Ph.D., Instructor in Chemistry.
CHARLES W. KOCH, B.S., Associate in Chemistry.

ISADOR PERLMAN, Ph.D., Associate Professor of Chemistry, Radiation Laboratory.

BURRIS B. CUNNINGHAM, Ph.D., Assistant Professor of Chemistry, Radiation Laboratory.

Letters and Science List.—All undergraduate courses except 144, 145A–145B, 146A–146B are included in the Letters and Science List. For regulations governing this list, see page 81.

Entrance with Advanced Standing.—All undergraduate students entering

* Absent on leave, 1946–1947.

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, 116 Gilman 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 93) 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 63) 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.

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: Chemistry 1A-1B, and one or more of courses 5, 8 and 9; Physics 1A, 1B, 1C, 1D; Mathematics 3A, 3B, 4A, 4B; and a reading knowledge of German. This work may be completed in part in the upper division if desired. For certain purposes involving less extensive advanced work than the normal major, shorter courses in physics (2A-2B, with or without 3A-3B), or mathematics (11A-11B), or both, may be substituted with advantage for the two-year sequences.

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.

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 100, 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 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.

Laboratory Fees.—For courses 1A–1B, 180H, 185, the fee is \$16 a semester; for courses 5, 105, 120, it is \$23; for course 145A–145B, it is \$15; for courses 9, 100, 101, 111 and 111H, it is \$31. These fees cover the cost of materials and equipment used by the careful student. The cost of materials and equipment used in excess of the estimated amount will be a separate charge.

LOWER DIVISION COURSES

1A. General Chemistry. (5) I and II.

Mr. HILDEBRAND, Mr. GIAUQUE, Mr. GIBSON, Mr. LATIMER, Mr. PITZER,
Mr. CONNICK, Mr. ENGLISH, Mr. JURA, Mr. POWELL, Mr. SHAND,
Mr. ZIMM, Mr. GWINN, Mr. ROLLEFSON

I and II: Lectures (Hildebrand, 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. Fee, \$16.

1B. General Chemistry. Qualitative Analysis. (5) II.

Mr. GIBSON, Mr. HILDEBRAND, Mr. GIAUQUE, Mr. LATIMER,
Mr. PITZER, Mr. CONNICK, Mr. ENGLISH, Mr. JURA,
Mr. POWELL, Mr. SHAND, Mr. ROLLEFSON, Mr. ZIMM

Lectures (Hildebrand).

Prerequisite: Chemistry 1A. Fee, \$16.

5. Quantitative Analysis. (3) I and II. Mr. OLSON, Mr. KOCH, Mr. ORLEMANN
Lecture and laboratory.

Prerequisite: Chemistry 1B with a grade of C or higher. Fee, \$23.

8. Organic Chemistry. (3) I and II.

Mr. CALVIN

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

9. Organic Chemistry—Laboratory. (3) I and II.

Mr. CALVIN, Mr. DAUBEN, Mr. PETERSEN, Mr. RAPOPORT

Lecture and laboratory.

Prerequisite: Chemistry 1B with a grade of C or higher. Chemistry 8 may be taken concurrently. Fee, \$31.

UPPER DIVISION COURSES

GROUP I

102. Advanced Organic Chemistry. (3) I.

Mr. STEWART

Prerequisite: courses 8, 9, 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, 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.

107. Organic Chemistry. (3) I and II. Mr. CASON
Prerequisite: courses 8 and 9.
Type reactions with emphasis upon new synthetic processes.
109. Physical Chemistry—Brief Course. (3) I. Mr. POWELL
Prerequisite: Chemistry 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: (Gwinn). II: (Rollefson).
110B. I: (Rollefson). II: (Gwinn).
Prerequisite: Chemistry 5, Mathematics 4A, and one year of college physics.
The general principles of physical chemistry and elementary thermodynamics.

UPPER DIVISION COURSES

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. (4) I and II.
Lecture and laboratory. Mr. STEWART, Mr. BRANCH
Prerequisite: courses 8, 9, and 5. Fee \$31.
101. Organic Chemistry—Synthetic Methods. (3) I and II. Mr. CASON
Prerequisite: courses 100 and 107 (101 and 107 may be taken concurrently). A reading knowledge of German is recommended. Fee, \$31.
105. Advanced Quantitative Analysis. (3) II. Mr. ORLEMANN
Lectures and laboratory.
Prerequisite: Chemistry 5. Fee, \$23.
- 111, 111H. Physical Chemistry—Laboratory. (3) I and II.
I (Gibson); II (Zimm). Mr. GIBSON, Mr. ZIMM
Prerequisite: course 110A, 110B (may be taken concurrently), or 109 with the permission of the instructor, and calculus. Fee, \$31.
- 114H. Physical Chemistry—Thermodynamics. (3) I.
Sec. 1 (Giauque); Sec. 2 (Pitzer). Mr. GIAUQUE, Mr. PITZER
Prerequisite: courses 5, 110A–110B; Physics 1C–1D or 2A–2B and 3A–3B; mathematics, familiarity with differential and integral calculus.
118. Chemistry of Surfaces and Colloids. (2) I. Mr. JURA
This course is offered in the form of independent study with reports 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 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. Fee, \$23. Mr. CONNICK, Mr. ENGLISH
Prerequisite: courses 5, 104 or 105, and 109 or 110B.
- *122. Phase Rule. (2) II. _____
Prerequisite: course 109 or 110B.
123. Chemistry of Radioactive Isotopes. (2) I. Mr. SEABORG
Prerequisite: senior standing.
144. Chemical Engineering, Stoichiometry. (3) I and II. Mr. SCHUTZ
Chemistry, equipment, and economics of typical process industries.
Material and energy balances.
Prerequisite: course 110B; may be taken concurrently.
- 145A-*145B. Unit Operations Laboratory. (2-2) Yr. Mr. SCHUTZ, Mr. WILKE
Three hours of laboratory and one hour of conference weekly. Sections to be arranged.
Prerequisite: Chemistry 144; Chemistry 146A-146B may be taken concurrently. Fee, \$15 per semester.
Laboratory study of the important variables effecting operation of equipment for adsorption, distillation, filtration, heat transfer, etc.
NOTE.—145A will be given in the spring semester only.
- 146A-146B. Chemical Engineering, Unit Operations. (3) Yr. Mr. SCHUTZ
Prerequisite: Chemistry 144.
Theory and design of equipment for absorption, distillation, drying, fluid handling, etc.
- 180H. Research. (3-15) I and II. The STAFF (Mr. LATIMER in charge)
Prerequisite: Chemistry 100 and 110B. Fee, \$16.
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. Fee, \$16.
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.

* Not to be given, 1946-1947.

GRADUATE COURSES

Concerning conditions for admission to work for higher degrees see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

216. Physical Chemistry, Advanced. (3) II. Mr. GIAUQUE
Prerequisite: courses 111H and 114H. Open to senior honor students with the permission 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 honors students with the permission of the instructor.

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 or 2) I and II. The STAFF (Mr. LATIMER in charge)
As a rule two seminars are offered in 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.

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—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. No credit.

COURSES IN OTHER DEPARTMENTS

Metallurgy. (Engineering: Mining and Metallurgy.)

Biochemistry.

Botany. (Plant Physiology.)

Physics. (Physics 110A, 110B, 112, 115, 121, 211A-211B, 213, 221A-221B.)

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, Mr. KEYS)
- Child Psychology. (Home Economics 132, Miss LANDRETH)
- Laboratory in Child Development. (Home Economics 133, Miss LANDRETH)
- Child Care and Family Health. (Home Economics 134, Miss LANDRETH)
- Techniques with Young Children. (Home Economics 135, 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 MUNSON. Given in the School of Nursing, Medical Center, San Francisco.)
- Mental Deficiency. (Psychology 160, Miss BRIDGMAN)
- Clinical Techniques. (Psychology 163, Mr. SHERRIFFS)
- Clinical Psychology. (Psychology 162, Mrs. MACFARLANE, Mrs. GULLBERG)
- Advanced Clinical Psychology. (Psychology 164, Mrs. MACFARLANE, Mrs. GULLBERG)
- Child Psychology. (Psychology 112, Mr. JONES)
- Laboratory in Child Study. (Psychology 114, Mr. JONES)
- Laboratory in Adolescent Development. (Psychology 115, Mr. JONES)
- Child Hygiene. (Public Health 121, Mr. COHEN, ——)
- Child Welfare. (Social Welfare 253A-253B, Mrs. FREDERICKSEN, ——)
- Vertebrate Embryology. (Zoölogy 100, Mr. EAKIN)
- Genetics. (Zoölogy 114, Mr. GOLDSCHMIDT)

CLASSICS

WILLIAM H. ALEXANDER, Ph.D., LL.D., F.R.S.C., Professor of Latin (Chairman of the Department).

HAROLD F. CHERNISS, Ph.D., Professor of Greek.

MONROE E. DEUTSCH, Ph.D., LL.D., Professor of Latin.

MURRAY B. EMENEAU, Ph.D., Professor of Sanskrit and General Linguistics.

IVAN M. LINFORTH, Ph.D., Professor of Greek.

H. R. W. SMITH, Ph.D., Professor of Latin and Classical Archaeology and Associate Curator of Classical Archaeology.

JAMES T. ALLEN, Ph.D., Professor of Greek, Emeritus.

LEON J. RICHARDSON, A.B., LL.D., Professor of Latin, Emeritus.

ARTHUR E. GORDON, Ph.D., Associate Professor of Latin.

JOSEPH FONTENROSE, Ph.D., Assistant Professor of Classics.

WILLIAM M. GREEN, Ph.D., Assistant Professor of Latin.

LILY ROSS TAYLOR, Ph.D., Sather Professor of Classical Literature, for the spring semester, 1947.

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 81.

Departmental Major Adviser: Mr. ALEXANDER.

Preparation for the Major in Classics.—Required: Greek 1 or 1A-1B, 2; 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. LINFORTH.

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; Art 156, 157, 158; History 111A.

LATIN

Major Adviser: Mr. ALEXANDER.

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

The Major.—The following courses must be included in the major of 24 units: (a) Latin 105, 106, 107, 108, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Latin. The remaining units of the 24 should be chosen, with the advice of the department,

from the following: upper division courses in Classics, Latin, Greek, Sanskrit; Art 156, 157, 158; 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 Virgil. (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
36. Plato. Lectures and Readings. (2) II. Mr. CHERNISS
- 170A-170B. Classical Archaeology. (2-2) Yr. Mr. SMITH
I: Vase painting in Greece before 600 B.C.
II: Vase painting in Greece and Italy in the sixth century, B.C.
178. Greek and Roman Mythology. (2) II. Mr. FONTENROSE
- 180A-180B. The Latin Classics in English. (2-2) Yr. Mr. ALEXANDER
I: The Republic.
II: The Early Empire.
- 182A-182B. Ancient Classical Civilization. (2-2) Yr. Mr. GORDON
Open also to lower division students to the extent of the room available.
I: Greek Civilization.
II: Roman Civilization.
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. (2) 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.

* Not to be given, 1946-1947.

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. CHERNISS
1A-1B. Greek for Beginners. (3-3) Yr. Mr. LINFORTH

UPPER DIVISION COURSES

Greek 100, 101, 102, 103, should be completed before the other courses (except 198) are undertaken. Greek 101 is prerequisite to 102 and 103.

100. Xenophon, *Anabasis*, and Attic Prose Writing. (3) I. Mr. LINFORTH
101. Homer. (3) II. Mr. LINFORTH
102. Plato: *Apology and Crito*. (3) I. Mr. CHERNISS
103. Drama. (3) II. Mr. LINFORTH
116. Thucydides. (3) I. Mr. CHERNISS
121. Theocritus and Alexandrian Poetry. (3) II. Mr. LINFORTH
198. Directed Group Study in Modern Greek. (1-3) I and II.
Prerequisite: Greek 1 or 1A-1B. Mr. FONTENROSE
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. LINFORTH 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. GREEN, Mr. GORDON, ———
2. Elementary Latin Readings. (4) I and II.
Mr. FONTENROSE, Mr. GORDON, Mr. GREEN, ———
Prerequisite: two years of high school Latin or Latin 1.
Reading and composition.
3. Virgil. (4) I and II. Mr. SMITH, Mr. FONTENROSE
Prerequisite: three years of high school Latin, or Latin 2. Readings in
the *Aeneid* I-VI; grammar review and composition.

4. Cicero and Catullus. (4) I and II. Mr. FONTENROSE, Mr. ALEXANDER
Prerequisite: four years of high school Latin, or Latin 3. Reading of a selected oration or essay of Cicero and selected poems of Catullus; grammar review and composition.

UPPER DIVISION COURSES

Prerequisite: Latin 4. Latin 105, 106, 107, 108 should be completed before the other courses (except 109A-109B) are undertaken.

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| 105. Livy. (3) I. | Mr. ALEXANDER |
| 106. Horace: <i>Odes and Epodes</i> . (3) II. | Mr. ALEXANDER |
| 107. Cicero: <i>De Natura Deorum</i> . (3) II. | Mr. GREEN |
| 108. Roman Comedy. (3) I. | Mr. GREEN |
| 109A-109B. Composition and Sight Reading. (2-2) Yr. | Mr. SMITH |
| 143. Lucretius: <i>De Rerum Natura</i> . (3) I. | Mr. GREEN |
| 146. Virgil and the Augustan Age. (3) II. | Miss TAYLOR |
| 151A. Seneca: <i>Moral Epistles</i> . (3) I. | Mr. ALEXANDER |
| 156. Juvenal. (3) II. | Mr. SMITH |
| 161A. St. Augustine. (3) II. | Mr. GREEN |
| †166. Latin Verse Composition. (1) I. | Mr. SMITH |
| 199. Special Study for Advanced Undergraduates. (1-5) I and II. | Mr. ALEXANDER in charge |

SANSKRIT

(NOTE.—Courses in this group are designated Sanskrit 190A, Sanskrit 190B, etc.)

Language and Literature

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|---|-----------------------|
| 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, Classics 220A, etc.).

Concerning conditions for admission to graduate courses, see page 146.

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| 200. Special Study. (1-5) I and II. | Mr. ALEXANDER in charge |
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† To be given if a sufficient number of students enroll.

220A-220B. The Ethical Works of Aristotle. (3-3) Yr.	Mr. CHERNISS
241A. Cicero's <i>Letters</i> . (3) I.	Mr. GORDON
249B. Propertius <i>Elegies</i> . (3) II.	Mr. FONTENROSE
†270B. Attic Black-figured Vase Painting. (2) I.	Mr. SMITH
271A-271B. Advanced Course in Archaeological Method. (2-2) Yr.	Mr. SMITH
†272A. Archaic Greek Sculpture. (2) II.	Mr. SMITH
*273. Problems in Attic Topography. (2) II.	Mr. SMITH
290A-290B. Advanced Sanskrit. (1-5; 1-5) Yr.	Mr. EMENEAU

* Not to be given, 1946-1947.

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

DECORATIVE ART

² HOPE M. GLADDING, Professor of Decorative Art and Design.

LILA M. O'NEALE, Ph.D., Professor of Decorative Art and Associate Curator of Textiles (Chairman of the Department).

MARY F. PATTERSON, Associate Professor of Decorative Art and Design, Emeritus.

¹ WINFIELD SCOTT WELLINGTON, M.A., Gr.Arch., Associate Professor of Design.

LEA VAN PUYMBROECK MILLER, M.A., Assistant Professor of Decorative Art and Design.

LUCRETIA NELSON, M.A., Assistant Professor of Design.

MARY A. DUMAS, M.A., Instructor in Decorative Art.

WILLARD V. ROSENQUIST, M.A., Instructor 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 81.

Departmental Major Advisers: Miss O'NEALE, Miss GLADDING.

Entrance with Advanced Standing.—All undergraduate students who enter the department with advanced standing should register in course 16A.

Preparation for the Major.—Required: Decorative Art 16A-16B (4), and Art 2A (2). Recommended: Architecture 1 (3); Art 2B (2), 3A-3B (4); 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 136A (3); Social Institutions 141 (3) or 142 (3).

Decorative Art 175A-175B, 176A, 193A-193B, 195A-195B, should normally be taken in the junior year. Decorative Art 130A-130B, 196A-196B, should be taken in the senior year.

Honors.—Senior students who have attained a B average in their major courses may enroll for Decorative Art 199.

Honors at graduation are awarded to students who have completed their

¹In residence fall semester only, 1946-1947. ²In residence spring semester only, 1946-1947.

major work with distinction and have attained uniformly high grades in all their college work.

Laboratory fees per semester are payable as follows: for courses 160A, 160B, \$2.50; 166, \$3; 176A, 176B, \$4. Materials for individual use to be furnished by the student.

LOWER DIVISION COURSES

16A-16B. Theory of Design and Color. (2-2) Yr.

Mrs. MILLER, Miss NELSON, Miss DUMAS, Mr. ROSENQUIST

I: 16A. Sec. 1 (Miller); Sec. 2 (Nelson); Sec. 3 (Rosenquist); Sec. 4 (Dumas); Sec. 5 (Rosenquist).

16B. Sec. 1 (Nelson); Sec. 2 (Dumas).

II: 16A. Sec. 1 (Rosenquist); Sec. 2 (Dumas).

16B. Sec. 1 (Rosenquist); Sec. 2 (Dumas).

*60A-60B. Theory of Design and Color: Second-Year Problems. (2-2) Yr.

Mrs. MILLER, 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

Prerequisite: course 16A-16B, or 16, and Art 2A, or equivalents. With the approval of the instructor, 160A and 160B may be taken out of their normal sequence in either semester. Fee, \$2.50 per semester. Enrollment limited by laboratory facilities.

166. Principles of Three-dimensional Abstract Design. (3) II. Miss NELSON

Enrollment limited by laboratory facilities.

Prerequisite: 16A-16B or 16, and Art 2A and 160A or 160B.

Recommended: Art 2B, Architecture 14. Fee, \$3.

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

175A-175B. Primitive and Folk Textiles. (2-2) Yr.

Miss O'NEALE

Either half of this course may be taken independently.

176A-176B. Textile Design. (2-2) Yr.

Mrs. MILLER

Enrollment limited by laboratory facilities.

Prerequisite or concurrent: courses 16A and 16B, or equivalent, and 175A or 175B. Course 176A is prerequisite to 176B. Fee, \$4.

Analyses, reconstructions, and experiments on the loom.

* Not to be given, 1946-1947.

‡ Not to be given in fall semester, 1946-1947.

179. Textile Analysis. (2) II. Miss O'NEALE
Prerequisite: courses 175A, 176A-176B or equivalent.
Enrollment limited by laboratory facilities. The permission 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 O'NEALE
Either half of this course may be taken independently.
I: 193A. From Ancient Times to 1400.
II: 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. 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 in major courses.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

- Seminar in Decorative Art. (2) I and II.
The STAFF (Miss O'NEALE in charge fall semester ;
Miss GLADDING in charge spring semester)
- 294A. Period Interiors. (2) II. Miss GLADDING
- 294B. Textiles. (2) I. Miss O'NEALE
Studies based upon materials selected from the various collections in the Museum of Anthropology.
- 294C. Decorative Motives in Oriental Art. (2) I. Mr. WELLINGTON
299. Directed Research. (2-4) I and II. The STAFF (Miss O'NEALE in charge)

* Not to be given, 1946-1947.

DRAMATIC ART

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

CHARLES D. VON NEUMAYER, Professor of Dramatic Art, Emeritus.

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

HENRY SCHNITZLER, Lecturer in Dramatic Art.

WARREN C. LOUNSBURY, Lecturer in Stage Crafts, and Technical Director of the University Theatre.

SETH POWERS ULMAN, A.B., Lecturer in Dramatic Art.

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

Letters and Science List.—All undergraduate courses are included in the Letters and Science List, except the following: Dramatic Art 20, 190, 191, 192, and 193. For regulations governing this list, see page 81.

Departmental Major Adviser: Mr. HARRIS.

Preparation for the Major.—12 units in the following courses: Public Speaking 2A (3) or Dramatic Art 407 (3), Dramatic Art 10A-10B (3-3), 20 (3).

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 history of theater, history of drama, and dramatic literature.

(A) Dramatic Art Courses: Theory. Dramatic Art 130A, 130B, 130C, 130D (3-3-3-3). (These courses offered in sequence in alternate years. Not more than 6 units to apply to the major.) Dramatic Art 135 (3), 160A-160B (3-3).

(B) Dramatic Art Courses: Practice. Dramatic Art 190, 191, 192. Not more than 6 units to apply to the major.

(C) Courses in History of Theater, History of Drama, and Dramatic Literature: Dramatic Art 157A-157B (3-3), English 114A-114B, 117A-117B (3-3-3-3), 117E (3), 154 (3), Spanish 109A-109B (3-3), French 120A-120B (3-3), German 108A (3).

(D) Recommended Courses: Lower Division. Music 27A-27B (3-3), Decorative Art 16A-16B (3-3), Classics 35 (2). Upper Division: Philosophy 136A-136B (3-3), Decorative Art 193A-193B (3-3).

The University Theater.—Under the direction of the Department of Dramatic Art, the University Theatre 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.

NOTE.—The attention of the student is directed to the major in dramatic literature (see page 71).

LOWER DIVISION COURSES

- 10A-10B. Principles and Theory of Acting. (3-3) Yr. Beginning each semester.
Mr. HARRIS, Mr. SCHNITZLER, Mr. ULMAN, _____
Limited to 20 students. Prerequisite: consent of the instructor.
20. Stage Crafts. (3) I and II. Mr. LOUNSBURY

UPPER DIVISION COURSES

Group A. Dramatic Art: Theory and Practice

- 130C-130D. Advanced Theory of Acting and Directing. (3-3) Yr.
Mr. HARRIS, Mr. SCHNITZLER
Prerequisite: courses 10A, 10B, 407 or Public Speaking 2A, and the consent of the instructor.
I: 130C. Seventeenth- and Eighteenth-Century Drama (Schnitzler).
II: 130D. Modern Drama. (Harris).
135. Theory of Directing. (3) I and II. Mr. HARRIS, Mr. SCHNITZLER
Prerequisite: courses 10A, 10B, 20, and the consent of the instructor.
- 160A-160B. Dramatic Theory. (3-3) Yr. Mr. THOMPSON
(A) Masterpieces of Dramatic Art and Criticism, from the Greeks to the Nineteenth Century.
(B) Contemporary Problems of Dramatic Art.
190. Laboratory Projects in Acting. (1-6) I and II.
The STAFF (Mr. HARRIS in charge)
Prerequisite: courses 10A-10B, 407 or Public Speaking 2A, and the permission of the department.
191. Laboratory Projects in Directing. (1-6) I and II.
The STAFF (Mr. HARRIS in charge)
Prerequisite: courses 10A-10B, 135, 407, and the permission of the department.
192. Laboratory Projects in Stage Crafts. (1-6) I and II.
The STAFF (Mr. HARRIS in charge)
Prerequisite: courses 10A-10B, 20, and the permission of the department.
NOTE.—Not more than 6 units from courses 190, 191, 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. _____
Prerequisite: courses 10A, 10B, and the consent of the instructor.

Group B. History of Drama and Dramatic Literature

- 157A-157B. Modern European Drama. (3-3) Yr. Mr. THOMPSON

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.

Spanish 109A-109B. The Spanish Drama. (3-3) Yr.

French 120A-120B. The Seventeenth Century. (3-3) Yr.

German 108A. Schiller's Life and Works. (3) I.

ECONOMICS

- ROBERT A. BRADY, Ph.D., Professor of Economics.
 NORMAN S. BUCHANAN, 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.
 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).
 EWALD T. GREYER, 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.
 LEO ROGIN, Ph.D., Professor of Economics.
 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.
 WILLIAM J. FELLNER, Ph.D., Associate Professor of Economics.
 ROBERT A. GORDON, Ph.D., Associate Professor of Economics.
 *SANFORD A. MOSK, Ph.D., Associate Professor of Economics.
 FRANK L. KIDNER, Ph.D., Assistant Professor of Economics.
 EARL R. ROLPH, Ph.D., Assistant Professor of Economics.

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- GRIFFITH C. EVANS, Ph.D., Professor of Mathematics.
 GEORGE L. MEHREN, Ph.D., Assistant Professor of Agricultural Economics.
 HAROLD J. HOFLICH, Ph.D., Lecturer in Economics.

Upper Division Prerequisites.—For students with a major in economics, Economics 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.

Letters and Science List.—All undergraduate courses in economics are included in the Letters and Science List. For regulations governing this list, see page 81.

Departmental Major Advisers: Mr. MOWBRAY, Chairman; Mr. BAIN, Mr. BUCHANAN, Mr. GULICK, Mr. LANDAUER, Mr. ROGIN, Mr. ROLPH.

Preparation for the Major.—Required: Economics 1A-1B and 40, and a minimum average grade of C in these courses. Recommended: Economics 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

* Absent on leave, 1946-1947.

major, and students in the School of Business Administration, complete Economics 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: Economics 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: Economics 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; Economics 101A, 101B, 150B.

III. Monetary and Fiscal Policy: Economics 103, 130A, 130B, 137.

IV. Labor Economics: Economics 150A*, 150B*; Business Administration 153, 154, 155.

V. Economic Systems: Economics 101B, 106, 110, 117A*, 117B*.

VI. Industrial Organization and Public Policy: Economics 116A*, 116B*, 117B, 122; Business Administration 134.

VII. Statistics: Courses to be selected in consultation with the departmental adviser.

VIII. International Economic Relations: Economics 190A*, 190B*, 197; Business Administration 136.

IX. Social Economics: Economics 150A, 180*, 185, 188A, 188B.

X. Transportation and Public Service Regulation: Economics 122, 170A*, 170B, 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.

A laboratory fee of \$2.50 is charged in Economics 40.

LOWER DIVISION COURSES

1A-1B. Elements of Economics. (3-3) Yr. Beginning each semester.

Mr. CROSS, Mr. GORDON, Mr. KIDNER

Prerequisite: 1A is prerequisite to 1B. Open to freshmen and others. Two lectures; one recitation section weekly to be arranged.

I: 1A. Sec. 1 (Cross); Sec. 2 (Kidner); 1B (Gordon).

II: 1A (Gordon); 1B. Sec. 1 (Cross); Sec. 2 (Kidner).

10. Economic History. (3) I and II. Mr. LANDAUER, Mr. HOFLICH
I: (Hoflich). II: (Landauer).
40. Elementary Statistics. (3) I and II. Mr. MOWBRAY
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. Fee, \$2.50.
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 his 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. BUCHANAN, Mr. FELLNER, Mr. HOFLICH,
Miss HUNTINGTON, Mr. KIDNER, Mr. ROLPH
100A. I: Sec. 1 (Kidner); Sec. 2 (Bain); Sec. 3 (Huntington); Sec. 4 (Hoflich). II: Sec. 1 (Buchanan); Sec. 2 (Huntington).
100B. I: Sec. 1 (Buchanan); Sec. 2 (Rolph). II. Sec. 1 (Kidner); Sec. 2 (Bain); Sec. 3 (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.
- 101A-101B. History of Economic Doctrine. (3-3) Yr. Mr. BRADY
102. Advanced Economic Theory. (3) I and II.
I: (Fellner); II: (Buchanan). Mr. BUCHANAN, Mr. FELLNER
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: Economics 100A-100B.
103. Dynamic Economics and Business Fluctuations. (3) I and II.
I: (Kidner); II: (Bain). Mr. BAIN, 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. ROGIN
In 1946-1947 this course will deal with current economic problems.
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) I and II. Mr. LANDAUER

110. Economic History Since 1850. (3) I and II. Mr. KNIGHT
Economic development since 1850 in the leading industrialized countries.
Prerequisite: one course in economic history and the permission of the instructor.
112. Economic History of Europe. (3) I. Mr. BRADY
113. Economic History of the United States. (3) I and II. Mr. HOFLICH
- *114. Economic Problems of Latin America. (3) I and II. Mr. MOSK
- *115. Economic Problems of the Far East. (3) I. Mr. KNIGHT
- 116A-116B. Industrial Organization and Public Policy. (3-3) Yr. Mr. BAIN
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. BRADY, Mr. LANDAUER
117A. I: (Landauer). General theory of economic planning.
117B. II: (Brady). Comparative study of economic planning in different countries.
122. Theory of Domestic Trade. (3) II. Mr. MEHREN
Primarily for seniors.
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. I: (Davisson). II: (Rolph). Mr. DAVISSON, Mr. ROLPH
130B. II: (Davisson).
135. Money and Credit. (3) I and II. Mr. CROSS, Mr. HOFLICH, Mr. ROLPH
I: Sec. 1 (Cross); Sec. 2 (Rolph).
II: Sec. 1 (Cross); Sec. 2 (Hoflich).
Primarily for juniors.
137. Money, Banking and Monetary Policy. (3) I and II.
I: (Buchanan). II: (———). Mr. BUCHANAN, ——
Prerequisite: Economics 135.
Analysis of the mechanics of the monetary system of the United States, with studies of monetary systems of other countries; problems involved in monetary management and evaluation of programs for monetary and banking reform.
- *142. Advanced Statistics. (3) II. Mr. MOWBRAY
Prerequisite: Economics 40, the consent of the instructor, and adequate mathematical preparation.
143. Economics of Insurance. (3) I and II. Mr. MOWBRAY, Mr. HOFLICH
I: (Mowbray). II: (Hoflich).
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.

* Not to be given, 1946-1947.

- 150A-150B. Labor Economics. (3-3) Yr. Mr. GULICK, Mr. TAYLOR
 150A. I: (Gulick). II: (Taylor).
 150B. I and II: (Gulick).
 (A) The social background of labor legislation and trade unionism.
 (B) History of the labor movement. 150A is recommended but not required as a prerequisite for 150B.
- NOTE.—Students will not receive credit for both 150A and Business Administration 151.
- 170A-170B. Transportation. (3-3) Yr. Mr. DAGGETT
 (A) Inland transportation; a general discussion of the economics of transportation including the inland waterway, the railroad, the street railway, the automobile, and the airplane.
 (B) 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. Mr. TAYLOR
 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. Mr. CONDLIFFE
 Fundamental factors in international economic relations.
197. Problems in International Economic Relations. (3) I and II.
 I: (Condliffe). II: (———). Mr. CONDLIFFE, ——
 Prerequisite: Economics 190A-190B.
 Research in problems of international economic policy for advanced undergraduate students.
- 199A-199B. Special Study for Advanced Undergraduates. (1-3; 1-3) Yr.
 The STAFF (Mr. BAIN, Mr. ROLPH in charge)
 I: (Rolph). II: (Bain).
 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 146.

- 200A-200B. Advanced Economic Theory. (3-3) Yr. Mr. FELLNER
- 201A-201B. History of Economic Thought. (2-2) Yr. Mr. ROGIN
202. Seminar in Advanced Economic Analysis. (2) II. Mr. BUCHANAN
The problem of international investment and the economic development of backward areas.
- 203A-203B. Dynamic Economics and Business Fluctuations. (2-2) Yr.
I: (Gordon). II: (Fellner). Mr. FELLNER, Mr. GORDON
- 204A-204B. Seminar in Contemporary Economic Theory. (3-3) Yr.
Prerequisite: course 200A-200B. Mr. ROGIN
- 206A-206B. Seminar in Social Reform. (2-2) Yr. Mr. LANDAUER
208. Mathematical Economics. (3) II. Mr. EVANS
Prerequisite: Mathematics 121.
- 212A-212B. European Economic History. (2-2) Yr. Mr. KNIGHT
- 213A-213B. American Economic History. (2-2) Yr. Mr. KNIGHT
- 216A-216B. The Structure of Business Enterprise and Public Policy. (2-2) Yr.
I: (Bain). II: (Gordon). Mr. BAIN, Mr. GORDON
Functioning of the industrial sector of an economy geared to large-scale production and responding to prices determined in imperfectly competitive markets. Ownership and entrepreneurial situation created by the large corporation. Implications for public policy.
217. Seminar in Economic Planning. (2) I and II. Mr. BRADY
- 231A-231B. Public Finance. (2-2) Yr. Mr. ROLPH
- 235A-235B. Advanced Money and Credit. (3-3) Yr. Mr. FELLNER
241. Statistical Methods in Social Investigation. (3) II. Miss HUNTINGTON
- 250A-250B. Seminar in Labor Economics. (3-3) Yr. Mr. GULICK, Mr. TAYLOR
250A. I: *Sec. 1 (Gulick); Sec. 2 (Taylor).
250B. II: Sec. 1 (Gulick); Sec. 2 (Taylor).
- 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.

* Not to be given, 1946-1947.

290A-290B. Principles of International Economic Relations. (2-2) Yr.

Mr. BUCHANAN, Mr. CONDLIFFE

290A. I: (Buchanan); 290B. II. (Condliffe).

Prerequisite: Economics 190A-190B.

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. (2) I and II.

Mr. CONDLIFFE

Research on current problems of international economic interest.

298. Research. (1-6) I and II. The STAFF (Mr. FELLNER in charge)

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.
- FRANK N. FREEMAN, Ph.D., D.Sc., Professor of Educational Psychology (Chairman of the Department).
- LUTHER C. GILBERT, Ph.D., Professor of Education.
- FRANK W. HART, Ph.D., LL.D., Professor of Education.
- MERTON E. HILL, Ed.D., Professor of Education.
- NOEL KEYS, Ph.D., Professor of Education.
- GEORGE C. KYTE, Ed.D., Professor of Education.
- GEORGE A. RICE, Ed.D., Professor of Education and Director of Supervised Teaching.
- DAVID H. RUSSELL, Ph.D., Professor of Education and Associate Director of Supervised Teaching.
- FLETCHER H. SWIFT, Ph.D., Pd.D., Professor of Education, Emeritus.
- L. A. WILLIAMS, Pd.D., Professor of Education, Emeritus.
- HAROLD D. CARTER, Ph.D., Associate Professor of Education.
- WILSON LITTLE, Ph.D., Associate Professor of Education.
- JOHN U. MICHAELIS, Ph.D., Associate Professor of Education.
- LARS H. PETERSON, Ph.D., Associate Professor of Education.
- WATSON DICKERMAN, Ph.D., Assistant Professor of Education.
- BERTRAND EVANS, Ph.D., Assistant Professor of English and Education.
- FREDERIC LILGE, Ph.D., Assistant Professor of Education.
- SIDNEY S. SUTHERLAND, M.S., Assistant Professor of Education and Supervisor of Teacher-Training in Agriculture, at Davis.

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- DWIGHT M. BISSELL, M.D., Lecturer in Public Health.
- FRANKLIN CARTER, Lecturer in Musical Education and Supervisor of the Teaching of Music.
- CLINTON C. CONRAD, Ph.D., Lecturer in Education and Supervisor of Supervised Teaching.
- MALCOLM H. FINLEY, B.S., M.A., M.D., Lecturer in Special Education.
- RICHARD S. FRENCH, Ph.D., Lecturer in Education.
- MABEL F. GIFFORD, Lecturer in Special Education.
- RICHARD D. MOSIER, Ph.D., Lecturer in Education.
- ILMA BADGLEY OATMAN, M.S., Lecturer in Education and Supervisor of the Teaching of Home Economics.
- EMILY G. PALMER, Ph.D., Lecturer in Education.
- HENRY SCHAEFER-SIMMERN, Lecturer in Art and Education.
- 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.

Supervisors of Student Teaching

MARION AVERY, A.B., Supervisor of the Teaching of Physical Education for Girls.

JESSIE E. BOYD, M.A., Supervisor of School Library Practice.

ROBERT E. BROWLEE, A.B., Director of Curriculum Laboratory.

LAWRENCE F. FOSTER, Ph.D., Supervisor of the Teaching of Science.

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.

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

BERNARD J. LONSDALE, M.S., Supervisor of Junior High Elementary Education.

VIBELLA MARTIN, M.A., Associate Director of Curriculum Laboratory.

HENRY MECKEL, M.A., 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.

THOMAS C. POLSON, Ph.D., Assistant Supervisor of the Teaching of Science.

ALICE SCHOELKOPF, M.A., Supervisor of Art Education in the Elementary School.

LESLIE SMITH, M.A., Principal, Claremont Junior High School, Oakland.

OLIVE STEWART, M.S., Supervisor of the Teaching of Social Studies in the Junior High School.

Letters and Science List.—Course 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 81.

Departmental Major Adviser: Mr. FREEMAN.

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 1A-1B) or philosophy (preferably 6A-6B).

The Major.—The major here described is the 24-unit major for the A.B. degree in the College of Letters and Science. A major in education is not an acceptable major for a Certificate of Completion of the teacher-training curricula.

Required, 18 units in education including the following 11 units: Education 101, 106, 110, 119, and a sequence of courses consisting of one of the following groups with additional courses from the remaining groups sufficient to make a total of 7 units.

I. History of Education 102; 105.

II. Educational Psychology 111; 113, 115, 116, 117, or 118.

III. Elementary Education 118; 130; 134 or 138.

IV. Educational Organization and Administration 141; 142; 145.

V. Vocational Education 160; 161, or 162; 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.

Laboratory fee in course 125 is \$5.

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.

UPPER DIVISION COURSES

Prerequisite: junior standing and Psychology 1A or equivalent.

History of Education

101. The History of Education—General Course. (3) I and II.

Mr. LILGE, Mr. MOSIER, Mr. SPINDT

The development of educational thought and practice viewed as a phase of social progress. Enrollment limited to 150 in each section.

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. Theory of Education. (2) I and II.

Mr. LILGE

A study of certain types of educational philosophy, and of the aims of education in their relation to social ethics and social change.

107. Education and Its Relation to Social Thought and Social Organization.

(2) I.

Mr. MOSIER

Educational Psychology

110. Introduction to Educational Psychology. (3) I and II.
Mr. GILBERT, Mr. H. D. CARTER, Mr. KEYS
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) II. Mr. H. D. CARTER
Prerequisite: six units in psychology or educational psychology.
114. Statistical Methods in Education. (2) II. Mr. H. D. CARTER
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) I and II. Mr. KEYS
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.
Prerequisite: courses 110, 130. Mr. FREEMAN, Mr. RUSSELL
A psychological analysis of the various subjects of the elementary school curriculum with particular attention to psychological experiments.
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.
120. Mental Hygiene—Elementary. (2) I. Mr. FINLEY
Prerequisite: course 110.
A basic mental hygiene course for persons concerned with problems of childhood. Development from infancy through adolescence with special reference to those factors contributing to mental health and those which are causal in personal, educational, and social problems. Aggressive and withdrawing types of behavior, speech problems, etc., studied as symptoms of mental hygiene difficulties. The teacher as a positive influence in the child's mental condition.

* Not to be given, 1946-1947.

Curriculum and Instruction

125. Instructional Materials and Equipment. (2) I and II. ———

Prerequisite: course 130 or 170.

An introduction to audio-visual, radio, and other aids to teaching; their selection, use, and evaluation. Laboratory work will include making and collecting teaching materials, such as slides, film strips, graphs, and charts; operating commonly used audio-visual equipment; and practicing demonstration and blackboard techniques. Fee, \$5.

Elementary Education

130. Elementary Education. (3) I and II. Mr. MICHAELIS

Prerequisite: course 110 (completed or taken concurrently).

131. Special Problems of Teaching in Elementary Schools. (2) I and II.

Mr. MICHAELIS

Teaching problems in English composition and language, spelling, geography, science, and arithmetic. Observation and criticism of lessons taught in the University Elementary School.

134. Reading and Literature in the Elementary School. (2) I. Mr. RUSSELL

138. Social Studies in the Elementary School. (2) II. Mr. MICHAELIS

Educational Organization and Administration

- *140. The Teacher and Administration. (2) II. Mr. PETERSON

Principles of educational administration as applied to the duties and responsibilities of the classroom teacher.

- *141. The Administration of City School Systems. (2) II. Mr. HART

Interpretation of the principles and policies involved in city school organization and administration.

142. The Administration of State School Systems. (2) I and II.

Mr. HART, Mr. LITTLE

The organization and administration of state school systems with special reference to the interrelation of federal, state, and county support and organization.

145. Problems in Public School Finance and Business Administration. (2) I.

Mr. PETERSON

Prerequisite: courses 140 or 141, and 142, and teaching experience.

148. Public Education in California. (2) II. 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 249.

* Not to be given, 1946-1947.

Health Education

151. Administration of the School Health Program. (2) II. Mr. BISSELL
 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. Mr. BISSELL

Vocational Education

160. Vocational Education. (2) I and II. Miss PALMER, Mr. SUTHERLAND
 I: Sec. 1 (at Berkeley); I and II: Sec. 2 (at Davis).
161. Problems in Vocational Education. (2) I and II.
 Prerequisite: course 160. Miss PALMER, Mr. SUTHERLAND
 I: Sec. 2 (at Davis); II: Sec. 1* (at Berkeley); Sec. 2 (at Davis).
162. Continuation Education. (2) I and II. (Given at Davis).
 Miss PALMER, Mr. SUTHERLAND
 I: Sec. 1* (at Berkeley); I and II: Sec. 2.
164. Vocational Guidance. (2) I and II. Miss PALMER
 Prerequisite: course 110 and consent of the instructor.
 The philosophy, organization, and administration of school programs of guidance; the activities and preparation of vocational counselors. Designed for directors of guidance, counselors, teachers, and others concerned with the guidance of youth.
165. Business Education in Secondary Schools. (3) I and II. Mrs. STUART
166. Homemaking Education in Secondary Schools. (2) I and II.
 Mrs. OATMAN
 The development, scope and organization of homemaking education in the public schools. Current trends and practices in curriculum planning; analysis of teaching materials; designed for students interested in teaching general home economics and nutrition.
169. Vocational Education for Women. (2) II. Miss PALMER

Secondary Education

170. Secondary Education. (2) I and II. Mr. LITTLE, Mr. CONRAD
 Prerequisite: courses 101 or 102, 110, and 111. Ordinarily juniors will not be admitted to this course. (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.) Students in both sections must have Mondays at 1 o'clock, free for group activities.
172. Junior High School Education. (2) I. Mr. MICHAELIS
 Prerequisite: course 110 already completed or taken concurrently.
 Methods, curricula, organization, and supervision.

* Not to be given, 1946-1947.

181. Adult Education. (2) I. Mr. DICKERMAN
 A general overview of the field of adult education; history, aims, methods and materials, organization and administration.
199. Special Study for Advanced Undergraduates. (1-5) I and II. Mr. FREEMAN, Mr. SUTHERLAND
 Sec. 1 (at Berkeley) (Freeman in charge).
 Sec. 2 (at Davis) (Sutherland in charge).

GRADUATE COURSES

As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation will consist normally of the completion of at least twelve 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. (2) I and II. Mr. CARTER in charge
 Research problems in education; historical and scientific methods; design of investigations; bibliographical techniques, statistical methods, survey methods, and laboratory techniques; methods of reporting results.
- 201A-201B. History of Education. Seminar. (2-2) Yr. Mr. MOSIER
 Admission on consultation with instructor.
 Application of methods of historical research in a selected field in the history of education.
- 206A-206B. Theory of Education. Seminar. (2-2) Yr. Mr. LILGE
 Systematic studies of individual authors or selected problems in the theory of education.
- 210A-210B. Advanced Educational Psychology. (2-2) Yr.
 Prerequisite: courses 110 and 114. Mr. FREEMAN, Mr. KEYS
- *214. Advanced Statistics with Application to Methods of Educational Investigation. (2) I. Mr. H. D. CARTER
- 216A-216B. Educational Psychology. Seminar. (2-2) Yr.
 The EDUCATIONAL PSYCHOLOGY STAFF (Mr. FREEMAN in charge)
 Admission on consultation with Mr. Freeman.
 Conferences for the presentation and discussion of methods and results of investigations in progress. 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. Freeman, Mr. Gilbert, or Mr. Keys.
217. Experimental Education. (2) I and II. Mr. GILBERT
 Admission on consultation with 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.

* Not to be given, 1946-1947.

220A-220B. Problems of Curriculum and Instruction in Art. (2-2) Yr.

Mr. SCHAEFER-SIMMERN

Both 220A and 220B will be given each semester.

Designed for supervisors and teachers of art in the elementary school or high school. Deals with problems in curriculum and instruction from the point of view of establishing a mental foundation of art education which aims at the unfolding and organic development of inherent artistic potentialities.

230A-230B. Elementary Education. Seminar. (2-2) Yr. Mr. MICHAELIS

Prerequisite: 12 units in education with teaching experience and the permission of the instructor.

Selected topics pertaining to improvement of instruction. For advanced students who are candidates for higher degrees.

231. Administration of Elementary Education: Practicum. (2) I.

Admission on consultation with the instructor.

Mr. KYTE

The work of the principal and his assistant in organizing, administering, and supervising an elementary school in order to improve instruction.

232A-232B. The Elementary School Curriculum. Seminar. (2-2) Yr.

Admission on consultation with the instructor.

Mr. RUSSELL

233A-233B. Supervision of Elementary Education: Practicum. (2-2) Yr.

Admission on consultation with the instructor.

Mr. KYTE

234A-234B. Supervision of Elementary Education. Seminar. (2-2) Yr.

Admission on consultation with the instructor.

Mr. KYTE

235. The Elementary School Curriculum. (2) II.

Mr. KYTE

Principles and procedures in curriculum-making for the elementary school.

Admission on consultation with the instructor.

240A-240B. Educational Administration. Seminar. (2-2) Yr.

Mr. HART, Mr. PETERSON

244. Problems in Schoolhousing. (2) I and II. Mr. HART, Mr. PETERSON

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. The basic material of study will be the school surveys, superintendents' reports, and contributions to education in the field of administration.

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. Vocational Education. Seminar. (2-2) Yr. Miss PALMER
- 261A-261B. Special Studies in the Administration of Vocational Education. (2-2) Yr. Miss PALMER
- 270A-270B. Secondary Education. Seminar. (2-2) Yr. Mr. LITTLE
Admission on consultation with the instructor.
- 272A. Secondary School Curriculum: Basic Principles. (2) I. Mr. LITTLE
Prerequisite: courses 110, 111, 170, or their equivalents, graduate standing, and permission of the instructor.
For advanced students who wish to make a thorough study of basic principles of curriculum development, with special reference to the secondary school.
- 272B. Secondary School Curriculum: Techniques of Curriculum Making. (2) II. Mr. LITTLE
Prerequisite: course 272A, graduate standing, and permission of the instructor.
For advanced students who wish to make critical studies of current practices in curriculum making in secondary schools. This course will place emphasis upon criteria for the selection and organization of instructional materials and activities. It will also stress practice in the analysis and evaluation of courses of study in current use.
273. Supervision in Secondary Schools. (2) I and II. Mr. LITTLE
Prerequisite: course 130 or 170, teaching experience, and the permission of the instructor.
275. Secondary Education: Survey. (2) I. _____
Survey and critical review of secondary education literature, including research studies, yearbooks, reports, and other documents. Study of the scope, status and trend of significant problems and aspects of the high school and junior college. For advanced students. Admission on consultation with the instructor.
276. The Administration of Secondary Education. Practicum. (2) I and II. Mr. HILL
Prerequisite: courses 170 and 141 or 142.
279. The Junior College: A Practicum. (2) I and II. Mr. HILL
Limited to candidates for advanced degrees or for the junior college credential whose special interest is teaching in or the administration of the junior college. Each student will be required to select a problem in the junior college field and develop it fully during the semester.
284. Counseling, Child Welfare and Parent Education. (2) I. Mrs. BAILEY
For counselors, supervisors of attendance and child welfare, and school administrators. Current practices with regard to pupil personnel services. Techniques in studying individual pupils; child guidance procedures frequently used; adaptations to different grade levels, to rural and urban situations. In-service training for cooperation in these techniques. Community resources in child welfare, especially parents' organizations and study classes. Techniques of parent education as part of adult education and as a factor in children's welfare.

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
Discussion of fundamentals of human nature; consideration of significance of knowledge in this field in our thinking with regard to problems of growth, development, education, and guidance.

298. Directed Research. Seminar. (2-4) I and II.

The STAFF (Mr. FREEMAN in charge)

Admission only with permission 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. RICE, Mrs. BAILEY, Mr. RUSSELL, Mr. CONRAD
and SUPERVISORY STAFF

Candidates for supervised teaching on any level must comply with the following regulations: (1) The University of California ordinarily will not accept for teacher training those candidates who do not meet the State Department of Education requirements in health including specifically sight and hearing; (2) the University of California will not admit to teacher training in course 320C inexperienced applicants who are more than 35 years of age.

- 320A. Lectures, field trips, observations and participation. Introduction to teaching; participation in some form of school work. A limited number of juniors and seniors will be admitted. It is strongly recommended that students reserve a two-hour period of time for observation. 1 unit.

I and II. Sec. 1, Rice (Secondary Credential only); Sec. 2, Russell (Elementary Credential only).

- 320c. Teaching, lectures, and conferences. (3)

Mrs. BAILEY, Mr. CONRAD, Mr. RICE, Mr. RUSSELL,
Mr. SUTHERLAND, and SUPERVISORY STAFF

Group conferences, I and II. Mrs. Bailey, Mr. Conrad, Mr. Rice, Mr. Russell, Mr. Sutherland, and Supervisory staff.

Prerequisite: 320A. Other prerequisites depend upon type of credential desired. For Junior College Credential: courses 110 and 279 or 170; for Secondary Credential: courses 101 or 102, 110, 170; for General Junior High School Credential, and General Elementary School Credential: courses 110, 118, 130, 134. In addition: a grade-point average of 1.5 in the work of the junior and senior years and a bachelor's degree.

Application for supervised teaching may be made in 107 Haviland Hall during the registration period of the last semester of the senior year.

Candidates who are graduates of institutions other than the University of California must submit two transcripts of records at the time of application.

320E. Professional Methods Sections and Conferences. (2) I and II.

All students enrolled in course 320C or 324 must enroll concurrently in one of these sections.

Sec. 1. Agriculture (at Davis).	Mr. SUTHERLAND
Sec. 2. Life Science and Science.	Mr. FOSTER, Mr. POLSON
Sec. 3. Mathematics.	Mr. HOGE
Sec. 4. English.	Mr. MECKEL
Sec. 5. Romance Languages.	Miss MILLER
*Sec. 6. Latin.	_____
Sec. 7. Social Studies	Miss STEWART
Sec. 8. Physical Education for Men.	Mr. HINDMAN
Sec. 9. Physical Education for Women. I.	Miss AVERY
Sec. 10. High School Art.	Miss HOLE
Sec. 11. Home Making.	Mrs. OATMAN
Sec. 12. Public School Music.	Mr. FRANKLIN CARTER
Sec. 13. Business Education.	Mrs. STUART
*Sec. 14. German.	_____
Sec. 15. General Junior High School or General Elementary School.	
	Mr. RUSSELL, Mrs. HOSTETTER, Miss LEAR, Mr. LONSDALE, Miss MERRILL, Miss SCHOELKOPF
Sec. 16. Junior College.	Mr. RICE
Sec. 17. Special Education. II.	

Mr. FRENCH and the STAFF in Special Education

321. Supervised Teaching and Class Management. (2) I and II.

Mr. RUSSELL, Mr. LONSDALE, Miss MERRILL

Prerequisite: courses 110, 118, 130, 134 and a bachelor's degree. Open only to students who plan to complete the 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.

322. Methods and Practice in Adult Education. (4) II. Mr. DICKERMAN

Prerequisite: course 181 or experience in adult education.

The class sessions will provide a review of the principles of adult education and a discussion of the psychology of adult learning and of methods and materials appropriate for work with adult groups. The field work, which is likely to be at night, will provide observation of adult study groups and practice in working with them. 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, Mr. SUTHERLAND

I and II. Sec. 1 (Conrad); Sec. 2 (Sutherland) (at Davis).

Prerequisite: course 320C, or experience as a teacher and the 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. Approximately one hundred hours, including preparation, will be devoted to the course.

* Not to be given, 1946-1947.

324. Practicum in Supervised Teaching. (4) I and II. Mr. RICE
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, Miss PALMER
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. Mr. FRENCH
A survey of current practices in the education of the exceptional child; national, state, and local organization of agencies dealing with the physically handicapped and mentally defective; problems of guidance and placement; teacher training; numbers, social and economic statuses. Special attention will be given to sources of information, books, pamphlets, and current periodicals in all major fields.
326. Supervised Teaching in Special Education. (4) II. Mr. FRENCH 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.
Teaching in near-by schools and institutions; conferences.
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) I. Mrs. SHRINER
Admission only on consultation with instructor.
Presentation of problems, including research and educational experiments. Adaptation of equipment for the individual child. Methods and curricular activities which aid coördination, speech, and walking. The social development of the child as integrated in the total school learning program.

COURSES IN OTHER DEPARTMENTS ACCEPTED AS ELECTIVES FOR CREDENTIALS IN EDUCATION

- English 300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I. Mr. EVANS
- French 300. Problems in the Teaching of French. (2) I. Mr. MEYLAN
- Librarianship 206. School Library Administration. (2) II. Miss BOYD
- Mathematics 107. Mathematics in Secondary Schools. (2) I. Mrs. McDONALD
- Music 328. Methods of Teaching Vocal Techniques. (½) I. ———

- Music 329A. Methods of Teaching Stringed Instruments. (1) I and II.
Mr. F. CARTER
- Music 329B. Methods of Teaching Brass Instruments. (1) I. Mr. KNUTH
- Music 329C. Methods of Teaching Wood-Wind Instruments. (1) II.
Mr. KNUTH
- Music 445D. Bassoon. ($\frac{1}{2}$) I. Fee, \$5. Mr. KUBITSCHEK
- Music 455A. French Horn. ($\frac{1}{2}$) I. Fee, \$5. Mr. TRUTNER

ENGINEERING

MORROUGH P. O'BRIEN, B.S., Professor of Engineering (Chairman of the Department).

EVERETT D. HOWE, M.S., Associate Professor of Engineering.

CIVIL ENGINEERING

RAYMOND E. DAVIS, C.E., D.Eng., Professor of Civil Engineering and Director of the Engineering Materials Laboratory.

FRANCIS S. FOOTE, E.M., Professor of Railroad Engineering.

HAROLD B. GOTAAS, Sc.D., Professor of Sanitary Engineering.

SIDNEY T. HARDING, B.S., Professor of Irrigation.

BRUCE JAMEYSON, B.S., Professor of Civil Engineering.

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.

HARMER E. DAVIS, M.S., Associate Professor of Civil Engineering.

HOWARD D. EBERHART, M.S., Associate Professor of Civil Engineering.

JOE W. KELLY, B.S., Associate Professor of Civil Engineering.

IGOR P. POPOV, M.S., Assistant Professor of Civil Engineering.

NED P. CLYDE, M.S., Instructor in Civil Engineering.

JOACHIM E. LIEBMANN, M.S., Lecturer in Civil Engineering.

ARNOLD OLITT, B.S., Lecturer in Civil Engineering.

RAY L. WALKER, B.S., Lecturer in Civil Engineering.

RICHARD J. WOODWARD, JR., B.S., Lecturer in Civil Engineering.

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.

CHARLES F. DALZIEL, E.E., Associate Professor of Electrical Engineering.

THOMAS C. MCFARLAND, M.S., Associate Professor of Electrical Engineering.

HERBERT J. SCOTT, E.E., Associate Professor of Electrical Engineering.

DAN M. FINCH, B.S., Assistant Professor of Electrical Engineering.

TROY D. GRAYBEAL, D.Eng., Assistant Professor in Electrical Engineering.

PAUL L. MORTON, Ph.D., Assistant Professor of Electrical Engineering.

JOSEPH T. GIER, M.S., Lecturer in Electrical Engineering.

A. H. REESOR SMITH, A.B., Lecturer in Electrical Engineering.

GEORGE F. TEALE, B.S., Lecturer in Electrical Engineering.

JOHN R. WHINNERY, B.S., Lecturer in Electrical Engineering.

IRRIGATION

BERNARD A. ETCHEVERRY, B.S., Professor of Irrigation and Drainage.
 SIDNEY T. HARDING, B.S., Professor of Irrigation.

MECHANICAL ENGINEERING

- ^a BENEDICT F. RABER, B.S., Professor of Mechanical Engineering.
 CARL J. VOGT, M.S., Professor of Mechanical Engineering.
 BALDWIN M. WOODS, Ph.D., Professor of Mechanical Engineering.
 JOSEPH N. LECONTE, M.M.E., Professor of Mechanical Engineering, Emeritus.
 FLOYD H. CHERRY, B.S., Associate Professor of Mechanical Engineering, Emeritus.
 HERBERT B. LANGILLE, A.B., Associate Professor of Mechanical Engineering, Emeritus.
 RICHARD G. FOLSOM, Ph.D., Associate Professor of Mechanical Engineering.
 CLYNE F. GARLAND, M.S., Associate Professor of Mechanical Engineering.
 E. PAUL DEGARMO, M.S., Associate Professor of Mechanical Engineering.
 JOE W. JOHNSON, M.S., Associate Professor of Mechanical Engineering.
 ALEXANDER S. LEVENS, M.S., C.E., Associate Professor of Mechanical Engineering.
 JOHN A. PUTNAM, Ph.D., Associate Professor of Mechanical Engineering.
 EMIL E. WEIBEL, Ph.D., Associate Professor of Mechanical Engineering.
 RAYMOND C. GRASSI, M.S., Assistant Professor of Mechanical Engineering.
 HAROLD W. IVERSEN, M.S., Assistant Professor of Mechanical Engineering.
 HAROLD A. JOHNSON, M.S., Assistant Professor of Mechanical Engineering.
 ENEAS D. KANE, M.S., Assistant Professor of Mechanical Engineering.
 RICHARD W. LEUTWILER, M.S., Assistant Professor of Mechanical Engineering.
 RAYMOND C. MARTINELLI, Ph.D., Assistant Professor of Mechanical Engineering.
 JAMES L. MERIAM, Ph.D., Assistant Professor of Mechanical Engineering.
 *EUGENE F. MURPHY, M.E., Assistant Professor of Mechanical Engineering.
 PRENTISS C. NELSON, M.S., Assistant Professor of Mechanical Engineering.
 ERICH G. THOMSEN, Ph.D., Assistant Professor of Mechanical Engineering.
 ROSTISLAV A. GALUZEVSKI, M.S., Instructor in Mechanical Engineering.
 LAWRENCE M. GROSSMAN, M.S., Instructor in Mechanical Engineering.
 JAMES T. LAPSLEY, M.S., Instructor in Mechanical Engineering.
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- DON M. CUNNINGHAM, M.S., Lecturer in Mechanical Engineering.
 FRANK M. HAMAKER, M.S., Lecturer in Mechanical Engineering.
 NATHAN W. SNYDER, M.S., Lecturer in Mechanical Engineering.

^a In residence second semester only, 1946-1947.

* Absent on leave, 1946-1947.

MINING AND METALLURGY

ANDERS J. CARLSON, C.E., Ph.D., Professor of Petroleum Engineering.

LIONEL H. DUSCHAK, Ph.D., Professor of Metallurgy.

LESTER C. UREN, B.S., Professor of Petroleum Engineering.

WALTER S. WEEKS, M.E., Professor of Mining.

ERNEST A. HERSAM, B.S., Professor of Metallurgy, Emeritus.

JOHN E. DORN, Ph.D., Associate Professor of Physical Metallurgy.

RALPH R. HULTGREN, Ph.D., Associate Professor of Physical Metallurgy.

EARL R. PARKER, Met.E., Associate Professor of Physical Metallurgy.

BERNARD YORK, E.M., Assistant Professor of Mining.

DAVID W. MITCHELL, M.S., Instructor in Metallurgy.

WILBUR H. SOMEETON, M.S., Instructor in Petroleum Engineering.

Service Charge.—Students registered in the College of Engineering pay a uniform service charge of \$20 a semester, which covers all required courses of the College of Engineering and all elective courses in the Department of Engineering. Students registered for 8 units or less pay a uniform service charge of \$15 a semester.

Laboratory Fees.—Students registered in other colleges pay fees per course as announced:

Engineering 2, 6, 22, 23, 24, \$2.50; 1A, 1B, 1X, 21, \$6; 10A, 10B, \$12.50; 41, \$10.

Civil Engineering 102A, 161, \$6; 108C, 108E, 108F, 108G, \$11.50; 123A, 123B, \$14.50.

Electrical Engineering 102, \$5; 104A, 104B, 105, 106, 126, 127, 135, \$11.50; 132A-132B, 133, \$17.50.

Mechanical Engineering 107, 131A, 131B, \$17.50; 143, \$3; 144, \$2.

Metallurgy 2A, 2B, 154, \$17.50; 110A, 110B, 150A-150B, 152L, 160, 172, \$9 a semester.

Lower Division courses in the Department of Engineering which are of general interest to students in various curricula are listed below:

ENGINEERING

1A-1B. Plane Surveying. (3-3) Yr. Mr. FOOTE, Mr. JAMEYSON, Mr. KELLY,
Mr. OLITT, Mr. WISKOCIL, Mr. CLYDE

I, II. Three recitation sections; three field sections.

1B, I.

1A, II.

Prerequisite: plane trigonometry and one high school unit in mechanical drawing. Fee, \$6 for each semester.

Principles; field practice; calculations and mapping.

1X. Supplementary Course in Plane Surveying: Field Work. (1) I and II.

Open only to students entering the colleges at Berkeley with 2 units credit for recitations and lectures in courses 1A, 1B. Fee, \$6.

2. Descriptive Geometry. (3) I and II. Mr. LEVENS in charge
Lectures and drafting.
Laboratory fee, \$2.50.
Prerequisite: 1 unit of mechanical drawing, plane geometry, and trigonometry, Mathematics 3A or 3 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. (Not to be given after 1946-1947.)
- *3. Summer Class in Plane Surveying. (4) The STAFF
The course will last four weeks. The camp site is near Fairfax, Marin County. For details see the ANNOUNCEMENT OF THE SURVEYING CAMP.
Prerequisite: Engineering 1A-1B.
6. Machine Drawing. (3) I and II. Mr. LEVENS in charge
Lecture and Drafting.
Laboratory fee, \$2.50.
Prerequisite: course 2 and 10A or 10B taken concurrently.
Delineation of machine parts with special emphasis upon the production of detailed working drawings and freehand sketches. (Not to be given after 1946-1947.)
8. Materials of Engineering Construction. (2) II. Mr. TROXELL, Mr. WISKOCIL
Prerequisite: sophomore standing in Engineering.
Structural properties and adaptability of various materials.
- 10A-10B. Production Engineering. (3-3) Yr. Mr. DEGARMO, Mr. GRASSI, Mr. HULTGREN
10A: Mr. Hultgren in charge. Lectures and demonstrations.
10B: Mr. DeGarmo, Mr. Grassi. Lectures and laboratory.
Laboratory fee, \$12.50. Enrollment limited. (Not to be given after 1946-1947.)
One section of 10B will be given in the fall semester.
Prerequisite: Chemistry 1A-1B; Mathematics 3A-3B; Physics 1A-1B.
Heat treatment of ferrous metals, mechanical treatment of metals and manufacturing processes as aids in fabrication of machine parts. Experiments on gauges and measuring instruments, machine tools, plastic-forming equipment, casting, heat treating, and welding.
14. Elements of Heat Power Engineering. (3) I. Mr. GROSSMAN
Prerequisite: Chemistry 1A-1B; Physics 1A-1B and Mathematics 3A-3B.
For engineering students enrolled in programs of study other than electrical engineering and mechanical engineering. (Not to be given after 1946-1947.)
NOTE.—Credit for both courses 14 and Mechanical Engineering 105A-105B will not be given except upon special approval by the Dean of the College of Engineering.
- 18A-18B. Strength of Materials. (3-3) Yr. Mr. JAMEYSON, Mr. KELLY
For students in Architecture. Prerequisite: Mathematics 4A, Physics 1A-1B or 4A. Note that course 18B will be offered in the fall semester only.
Elementary analytic mechanics; application of statics and theory of elasticity to elements of structural design.

* To be given on campus if conditions prevent the usual camp arrangements.

21. Plane Surveying. (3) II. Mr. JAMEYSON, Mr. CLYDE
Lectures and field work.
Prerequisite: plane trigonometry and one high school unit in mechanical drawing. Fee, \$6. Prescribed for students in architecture; not open to students in engineering.
Principles; field practice; calculations and mapping.
22. Engineering Drawing. (2) I and II. Mr. LEVENS in charge
Lectures and drafting.
Laboratory fee, \$2.50.
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. LEVENS in charge
Lectures and drafting.
Laboratory fee, \$2.50.
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. LEVENS in charge
One lecture and five laboratory hours per week. Laboratory fee, \$2.50.
Prerequisite: course 23.
Working drawings of machine parts; freehand sketching; structural detailing; piping layouts; and introduction to graphic integration and differentiation.
- *35. Statics and Kinematics. (3) II. Mr. WEIBEL in charge
Three lectures per week. (To be given in 1947-1948.)
Prerequisite: Physics 4A; Mathematics 4A, 4B (may be taken concurrently).
Forces and equilibrium conditions as applied to engineering problems. Displacement, velocity, and acceleration relations, and their application to engineering problems. Both algebraic and graphical methods are used.
- *41. Manufacturing Processes. (4) II. Mr. DEGARMO in charge
Two lectures, one demonstration period, and one three-hour laboratory period per week. Laboratory fee, \$10. (To be given in 1947-1948.)
Prerequisite: courses 23 and 40; Chemistry 1A; Physics 4A.
Nonmetals; casting processes; gaging; 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.
48. The Engineering Student and His Profession. (1) I and II. Mr. WOODS
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.

* Not to be given, 1946-1947.

CIVIL ENGINEERING

- 102A. Route Surveying. (3) I. Mr. FOOTE, Mr. CLYDE
Lectures and field work.
Prerequisite: Engineering 1A-1B. Fee, \$6.
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.
- †103. Summer Class in Route Surveying. (3) The STAFF
- 104A-104B. Railroad Location, Construction, Maintenance. (2-2) Yr. Mr. FOOTE
Prerequisite: courses 102A, 102B. 104A is not prerequisite to 104B.
Location surveys, line and grade changes, tunnels, grading, track laying, maintenance, yards, signaling, valuation.
105. Higher Surveying and Geodesy. (2) II. Mr. FOOTE
Prerequisite: Engineering 1A-1B and Astronomy 107.
Methods of geodetic surveying; adjustment of observations; geodetic positions; map projections.
106. Highway Engineering. (2) I. Mr. JAMEYSON
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) II. Mr. R. E. DAVIS, Mr. H. E. DAVIS
For students in civil, electrical, and mechanical engineering who have completed courses 108A and Mechanical Engineering 102A.
Computation of stresses in roofs, building frames, and simple bridge trusses, by algebraic and graphical methods.
- 107B. Framed Structures. (3) I. Mr. R. E. DAVIS, Mr. H. E. DAVIS
For students in electrical and mechanical engineering who have completed courses 108A-108B and Mechanical Engineering 102A-102B (108B and Mechanical Engineering 102B may be taken concurrently with 107B); and for students in architecture who have taken Engineering 18A and are taking 18B concurrently.
Analysis of statically determinate and indeterminate structures by algebraic and graphical methods.
- 107C-107D. Framed Structures. (3-3) Yr. Mr. EBERHART, Mr. JAMEYSON, Mr. OLITT
Prerequisite: courses 107A and 108A-108B. For students in civil engineering.
Lectures and drafting. Continuation of course 107A. Stress computations for steel-framed structures; design of plate girders, roof and bridge trusses; bridge shop practice.

† To be given if a sufficient number of students enroll. To be given on campus if conditions prevent the usual camp arrangements.

- 107E-107F. Framed Structures. (3-3) Yr. Mr. TROXELL
 Prerequisite: courses 108A-108B, 107A, or Engineering 18A-18B, 112.
 For architectural students. Stress computations and design of structures in wood, steel, and reinforced concrete, particularly of buildings; foundations and retaining walls; structural specifications.
- 107G. Analysis of Airplane Structures. (3) I. Mr. EBERHART
 For students in civil, electrical and mechanical engineering who have completed courses 108A-108B, 107A, and Mechanical Engineering 102A-102B.
 Solution of typical stress analysis problems; load requirements; thin web beams; monocoque 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
 Both 108A and 108B will be given each semester.
 Prerequisites: for civil engineering and mining and metallurgy, Mathematics 4A-4B, Physics 1C-1D, Mechanical Engineering 102A-102B (or taken concurrently); for electrical and mechanical engineering, Mathematics 4A-4B (or 14A), Physics 1C-1D, and Mechanical Engineering 102A-102B (or taken concurrently).
 Elastic and ultimate resistance of materials; stress analysis for bars, beams, columns, and shafts; theory of resilience; deflections and combined stresses; elements of design for wood, steel, and reinforced concrete structures.
- 108C. Civil Engineering Laboratory. (1) I.
 Mr. R. E. DAVIS, Mr. H. E. DAVIS, Mr. EBERHART, Mr. KELLY,
 Mr. TROXELL, Mr. WISKOCIL, Mr. OLITT
 Prerequisite: Engineering 8 and Civil Engineering 108A-108B. Fee, \$11.50.
 Physical tests of brick, concrete, iron, steel, and wood.
- 108E. Civil Engineering Laboratory. (2) II.
 Mr. R. E. DAVIS, Mr. H. E. DAVIS, Mr. EBERHART, Mr. KELLY,
 Mr. TROXELL, Mr. WISKOCIL, Mr. OLITT
 One three-hour laboratory period and one drafting period for the preparation of reports. Prerequisite: Engineering 8 and satisfactory standing in 108A-108B. Fee, \$11.50.
 Physical tests of cement, concrete, mortar, and aggregates for concrete.
- 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
 For students in electrical and mechanical engineering, mining and metallurgy, and architecture.
 Prerequisites (may be taken concurrently): for electrical and mechanical engineering, mining and metallurgy, course 108A, and Engineering 8 or 10A; for architecture, course 18A. Fee, \$11.50.
 I. For electrical engineering, mining and metallurgy, and architecture.
 II. For mechanical engineering, mining and metallurgy, and architecture.
 Physical tests of brick, cement, mortar, concrete, steel, iron, and wood.

- 108g. Civil Engineering Laboratory. (2) I and II. Mr. H. E. DAVIS, Mr. OLITT
Prerequisite: senior standing in the College of Engineering. Fee, \$11.50.
Physical and mechanical tests on soils for engineering purposes, supplemented by lectures on soil mechanics.
- 109A. Sewerage Engineering. (2) I. Mr. GOTAAAS
Prerequisite: course 110.
Flow in sewers; fundamental considerations; design and construction of sewerage works.
- 109B. Sewage and Sewage Disposal. (2) II. Mr. LANGELIER
Prerequisite: course 111B.
Chemical and biological character of sewage; its treatment and disposal.
110. Hydraulics. (3) I. Mr. J. W. JOHNSON, Mr. PUTNAM
Prerequisite: Mathematics 4A-4B, Physics 1C-1D. Mechanical Engineering 102A must be taken concurrently.
Theory; application of principles; water-measuring devices; stream gauging.
- 111A. Water Supply Engineering. (2) II. Mr. GOTAAAS
Prerequisite: course 110.
Water supply demands, yields of water sources; design and construction of water works.
- 111B. Character and Sanitation of the Water Supply. (2) I. Mr. LANGELIER
Prerequisite: courses 111A and 123A-123B.
Water from the aesthetic, commercial, and sanitary points of view; water purification.
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. Foundations of Structures. (2) I. Mr. H. E. DAVIS, Mr. OLITT
Prerequisite: course 108A-108B.
Ordinary foundations, footings, sheet piling, piles, cofferdams, open caissons, pneumatic process; deep well dredging.
114. Masonry Structures. (3) II. Mr. H. E. DAVIS, Mr. JAMEYSON, Mr. OLITT
Prerequisite: courses 108A-108B and 113.
Lectures and drafting design of typical masonry structures, such as dams, retaining walls, bridge piers, abutments, culverts, aqueducts, chimneys, stone and concrete arches, and arch bridges.
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.
- 123A-123B. Sanitary Engineering Laboratory. (3-3) Yr. Mr. GOTAAAS
Prerequisite: Chemistry 1A-1B. Fee, \$14.50 each semester.
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 123A-123B and 111B.
161. Hydraulic Laboratory. (2) I and II. Mr. J. W. JOHNSON
Prerequisite: May be taken concurrently with course 110 or with Mechanical Engineering 103.
Intended primarily for students in civil engineering, electrical engineering, irrigation, and mining. Laboratory fee, \$6.
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 146.

208. Advanced Soil Mechanics. (3) I. Mr. H. E. DAVIS
Prerequisites: Civil Engineering 108G, 113; Mechanical Engineering 103 or Civil Engineering 110.
Lectures, reading assignments, laboratory problems, and reports on advanced topics in soil mechanics.
- †220A-220B. Framed Structures. (3-3) Yr. Beginning each semester.
Mr. H. E. DAVIS, Mr. R. E. DAVIS, Mr. EBERHART, Mr. JAMEYSON, Mr. KELLY, Mr. LANGELIER, Mr. TROXELL, Mr. WISKOCIL
Prerequisite: course 107C-107D. Program to be arranged in each case.
Analysis and design of statically indeterminate frames, continuous girders and trusses, movable, cantilever, suspension, and metallic arch bridges, and reinforced concrete structures; advanced problems in mechanics of materials.

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

†222A-222B. Sanitary Design. (3-3) Yr. Beginning each semester.

Mr. LANGEЛИER

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.

†223A-223B. Civil Engineering Laboratory. (3-3) Yr. Beginning each semester.

Mr. H. E. DAVIS, Mr. R. E. DAVIS, Mr. EBERHART, Mr. JAMEYSON,
Mr. KELLY, Mr. TROXELL, Mr. WISKOCIL

Program to be arranged in each case. Prerequisite: Engineering 8, Civil Engineering 108A-108B, 108C, 108E.

The Engineering Materials Laboratory is equipped with apparatus to investigate properties of engineering materials.

†225A-225B. Advanced Sanitary Engineering Laboratory. (3-3) Yr.

Beginning each semester.

Mr. LANGEЛИER

Prerequisite: course 123A-123B. Program to be arranged in each case.

Special laboratory problems in water, sewage, air, and refuse analysis; tests of apparatus, experimental or practical, in available localities.

230A-230B. Advanced Mechanics of Materials. (2-2) Yr.

Mr. POPOV

Prerequisite: courses 107A, 108A-108B, 108C, Mechanical Engineering 102A-102B.

Application of the theory of elasticity to complex states of stress; stress distribution in the range of plastic action; bending of plates, curved bars and beams on compressible supports; stresses in thick-walled cylinders; unsymmetrical bending; torsion of noncircular elements; theories of failure; design of structural elements for fluctuating and sustained loads.

275. River-Harbor Hydraulics. (3) I.

Mr. J. W. JOHNSON

Prerequisite: graduate standing.

The theory underlying the design of hydraulic structures with particular reference to variable flow, channel waves, tides, transportation of detritus by stream, beach erosion, and the use of hydraulic models.

270. Airport Engineering. (3) II.

Mr. H. E. DAVIS

The selection of the site, and the planning, design, and construction of airports.

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.

299. Individual Study or Research. (1-5) I and II. Mr. H. E. DAVIS in charge

Prerequisite: graduate standing.

Investigation of selected advanced civil engineering subjects.

ELECTRICAL ENGINEERING

UPPER DIVISION COURSES

100A-100B. Electrical Circuits and Machinery. (3-3) Yr.

Mr. ROBERTSON, Mr. TEALE

Prerequisite: Mathematics 14A or 4A-4B; Physics 1C.

Required for students in mechanical engineering.

(A) Voltage generation; circuit constants; single-phase and polyphase

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

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. GRAYBEAL
Open to engineering students not registered in electrical or mechanical engineering.
Prerequisite: Mathematics 4A, Physics 1C.
Electric power generation, transmission, distribution and utilization.
102. Electrical Engineering Laboratory. (1) I and II. Mr. GRAYBEAL
One three-hour period per week to be arranged. Sections limited to 15 students.
Prerequisite: Electrical Engineering 101, which should be taken concurrently if possible. Fee, \$5.
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. Advanced Electrical Theory. (2-2) Yr. Mr. MARSHALL
Prerequisite: courses 104A-104B and 100A-100B or 110A-110B. (For students who have the permission of the instructor. 103A is not prerequisite to 103B.)
Phenomena in electrical, magnetic, and dielectric circuits in the light of recent discoveries and modern physical theory.
- 104A-104B. Electrical Laboratory. (1-1) Yr. Mr. ROBERTSON and the STAFF
Three hours weekly.
Prerequisite: course 100A-100B or 110A-110B which may be taken concurrently.
Laboratory fee, \$11.50 per semester.
Introductory experiments illustrating principles of design and operation of alternating and direct-current motors and generators, transformers, vacuum tubes, single and polyphase circuits, metering and control equipment.
105. Electrical Measurements in Engineering. (3) I. Mr. MORTON and the STAFF
(Formerly numbered 107.)
Prerequisite: course 100A, or 101, 110A. Laboratory fee, \$11.50.
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. BLACK and the STAFF
Lecture and laboratory.
Prerequisite: course 100A, or 101, or 110A may be taken concurrently.
Laboratory fee, \$11.50.
Electron emission; motion of charges in electromagnetic fields; electrical conduction in vacuum and through gases; electron tubes, high-vacuum and gas-filled; rectifiers; amplifiers; oscillators; illustrative application of electronic devices in industrial and communication equipment.

* Not to be given, 1946-1947.

- 110A-110B. Electrical Circuits and Machinery. (3-3) Yr. Mr. MCFARLAND
 Prerequisite: Mathematics 14A or 4A-4B; Physics 1C.
 Required for students in Electrical Engineering.
 (A) Alternating-current circuits.
 (B) Single-phase transformers, polyphase transformations, polyphase induction motors.
- 111A-111B. Advanced Electrical Machinery. (3-3) Yr. Mr. MCFARLAND
 Prerequisite: courses 104A-104B, 110A-110B; Mechanical Engineering 102A-102B. Course 111A is not prerequisite to 111B.
 Construction, theory of operation and performance characteristics.
113. The Engineer and His Professional Duties. (2) I and II. Mr. MCFARLAND
 Restricted to seniors in the curriculum in electrical engineering.
 Oral and written reports on various subjects.
- 116A-116B. Engineering Electronics and Radio Engineering. (3-3) Yr. Mr. REUKEMA
 Prerequisite: senior standing in electrical or mechanical engineering.
 Design and operating characteristics of radio transmitters and receivers for both amplitude and frequency modulation, of television transmitters and receivers, and of public address systems, the propagation of radio waves, and the design of antennas and antenna arrays.
- 117A-117B. Electromagnetic Fields and Waves. (3-3) Yr. Mr. WHINNEY
 Prerequisite: senior standing in electrical engineering.
 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 Short Circuits. (2-2) Yr. Mr. DALZIEL
 Prerequisite: Electrical Engineering 111A, which may be taken concurrently.
 Introduction to symmetrical components, short circuits, decrement curves, power-system protection, metering and miscellaneous problems.
- 122A-122B. Electric-Power Transmission and Distribution. (3-3) Yr. Mr. TEALE
 Prerequisite: senior standing in electrical or mechanical engineering.
 Power system layout and economy. Fundamental theory and design of transmission lines, calculation and control of their operating characteristics. Distribution systems and practices; stations, primary and secondary lines, load studies. Inspection of representative plant.
- 123A-123B. Telephone Engineering. (3-3) Yr. Mr. REUKEMA
 Prerequisite: senior standing in electrical or mechanical engineering.
 Course 123A is not prerequisite to 123B.
 Telephone, telegraph, and television transmission over open-wire line, cables and coaxial lines, characteristics of speech and hearing, design of transmitters and receivers, amplifiers, electrical filters, equalizers, phase distortion correctors, delay circuits, impedance balancing circuits, and other electrical networks, and their coordination in communication circuits.

126. Industrial Electronics. (4) I.

Mr. SMITH

Prerequisite: course 106. Laboratory fee, \$11.50.

The applications of electronic devices in industry and in the research laboratory. Induction heating of metals and dielectrics; electrolytic refining of metals; ignitron control of electric welding; thyatron and photo-cell control of temperature, voltage, current, motor speed, theater lighting, and industrial processes; applications of the cyclotron, the induction electron accelerator, the precipitron, stroboscopes, and industrial X-ray equipment.

127. Automatic Regulators. (4) II.

Mr. GRAYBEAL

Prerequisite: courses 110A-110B and 104A-104B. Laboratory fee, \$11.50.

Feed-back principle; basic considerations in regulator design; function and behavior of component parts of regulators. Theory of steady-state and transient performance. Criteria for stability. Applications to voltage, current, and kv-a regulators; constant speed, constant torque, and constant horsepower drives; synchronized mechanically independent drives; positioning controls; servomechanisms.

132A-132B. Electrical Communications Laboratory. (2-2) Yr.

Mr. BLACK, Mr. SCOTT

Prerequisite: courses 104A-104B, 110A-110B completed; 116A, which may be taken concurrently with 132A. Laboratory fee, \$17.50 per semester.

Experiments illustrating the fundamental principles involved in the operation of communication circuits and electronic devices. Particular considerations are given to the special methods of measurement, and technique, which must be employed at high frequencies.

133. Electrical Machinery Laboratory. (2) I. Mr. DALZIEL and the STAFF

Prerequisite: courses 104A-104B, 110A-110B completed; 111A which may be taken concurrently with 133. Laboratory fee \$17.50 per semester.

Selected experiments on alternating current machinery, designed to illustrate fundamental principles, application, and recent developments in electric power machinery.

135. Control of Electric Motors. (3) I.

Mr. GRAYBEAL

Prerequisite: courses 110A-110B or 100A-100B, and 104A-104B. Laboratory fee, \$11.50.

Design, construction and operation of motor control equipment. Electromagnets, manual and magnetic starters, wiring diagrams, theory of automatic protection, breakers and arc extinction, electronic control devices. Automatic and remote control. Coördinated drives. Controllers for adjustable speed motors, power selsyns, cranes, frequency changers, and other electrical machinery.

140. Illumination Engineering. (3) I and II.

Mr. FINCH

Prerequisite: senior standing or by special permission of the instructor.

Discussion and laboratory experiments in the basic principles of lighting as related to vision. Spectral characteristics of light sources. Photometric concepts, measurement of light, design of lighting 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 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 146.

216. Advance Radio Communication. (3) I. Mr. REUKEMA
Prerequisite: courses 116A-116B, 117A-117B.
Radiation and reception of electromagnetic energy and its propagation through space, advance theory and design of antennas, beam transmission and reception, radar and radio aids in navigation and aviation.
217. Bessel Functions and Their Applications to Engineering Problems. (3) II. Mr. REUKEMA
Prerequisite: courses 116A-116B and 117A-117B.
Problems involving Bessel functions, their integration and asymptotic expansion in the fields of frequency modulation, cylindrical wave guides, resonant cavities, skin effect in conductors, vibrations in stretched circular or annular membranes, and design of radiating horns.
218. Power System Stability. (2-4) II. The STAFF (Mr. MCFARLAND in charge)
Prerequisite: course 118A and 118B, which may be taken concurrently.
Reduction of power networks, static, dynamic and transient stability of power systems.
- 220A-220B. Electro-Acoustics. (2-2) Yr. Mr. BLACK
Principles and apparatus involved in the production, propagation, measurement, and reception of sound.
221. Transient Phenomena. (2) I. Mr. ROBERTSON
Studies of transient phenomena in electrical and mechanical systems; physical and mathematical analyses; single, mesh, and coupled circuits; electromechanical equivalent; heat flow; practical applications.
222. Operational Circuit Analysis. (2) II. Mr. MORTON
Application of the operational calculus to circuit analysis. Direct operational methods; expansion; infinite integral, Borel's, and shifting theorems; transfer operators; circuits with distributed constants.
- 226A-226B. Advanced Industrial Electronics. (3-3) Yr. Mr. SMITH
Prerequisite: course 126.
Influence of non-linear circuit parameters on design of high-frequency equipment; electronic instrumentation; counting circuits; medical applications; geophysical prospecting; elementary electron optics; semiconductors; electro-organic chemical processes.

298. Group Studies, Seminars, or Group Research. (1-5) I and II.
The STAFF (Mr. McFARLAND in charge)
Prerequisite: graduate standing.
Advanced study in various fields of electrical engineering. Topics will 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.
299. Individual Study or Research. (1-5) I and II.
The STAFF (Mr. McFARLAND in charge)
Prerequisite: graduate standing.
Investigation of advanced electrical engineering problems.

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 Catalogue and in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

UPPER DIVISION COURSES

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. Mr. HARDING
Prerequisite: junior standing and Engineering 1A.
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 tide waters; 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.

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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 or 3) I and II. Mr. ETCHEVERRY
Prerequisite: Civil Engineering 108A-108B and 110.
Design of structures such as flumes, drops, inverted siphons, and head-gates with estimates of cost.
113. Development and Use of Farm Irrigation Water Supplies. (3) I. Mr. HARDING
Prerequisite: Physics 1A-1B or 2A-2B or 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 146.

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. Mr. ETCHEVERRY in charge
Prerequisite: graduate standing.
Special studies and problems relating to drainage, reclamation, and flood protection; irrigation institutions and organizations; development and utilization of water supplies.
299. Individual Study or Research. (1-5) I and II. Mr. ETCHEVERRY in charge
Prerequisite: graduate standing.
Investigation of advanced irrigation, drainage and flood protection problems.

MECHANICAL ENGINEERING

UPPER DIVISION COURSES

- 102A-102B. Analytical Mechanics. (3-3) Yr. Mr. WEIBEL in charge
In the fall semester, one section of 102B will be given. (102A not to be given after 1947-1948.)
Prerequisite: Mathematics 4A-4B; Physics 1A-1B. Mathematics 110A-110B is recommended.
An introductory course in applied mechanics designed especially to meet the needs of students in engineering. The force, momentum, and energy methods of solution are utilized.

103. Elementary Fluid Mechanics. (3) I and II. Mr. PUTNAM in charge
Prerequisite: junior standing in an engineering curriculum.
The principles of mechanics applied to the flow of compressible and incompressible fluids. Includes the hydraulic problems of flow in closed and open conduits.
NOTE.—Class standing in a curriculum requires satisfactory completion of all lower division courses listed in the reference program of study.
- 105A–105B. Thermodynamics. (3–3) Yr. Mr. RABER, Mr. VOGT
A special section is offered for students in the chemical engineering option.
Prerequisite: junior standing in an engineering program of study.
Energy transformation, equilibrium, reversibility, availability, and thermal properties of gases and vapors. Theoretical cycles, practical engine forms, mechanisms and economic performance of heat power equipment. Heat transmission and heat transmission apparatus.
- 106A. Machine Design. (3) I and II. Mr. GARLAND in charge
Two lectures and one three-hour laboratory per week. (Not to be given after 1947–1948.)
Prerequisite: senior standing in the mechanical engineering program of study.
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. GARLAND in charge
Two lectures and two three-hour laboratory periods per week.
Prerequisite: 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. Lectures and problems.
107. Elementary Heat Power Laboratory. (3) I and II. Mr. NELSON in charge
Laboratory fee, \$17.50.
Prerequisite: course 105A and 105B (may be taken concurrently). For students in other than the mechanical engineering program of study.
Heat transfer, thermodynamics, fluid flow, and mechanics.
111. Graphical and Mechanical Computations. (2) II. Mr. LEVENS
Two lectures a week.
Prerequisite: senior standing in an engineering program of study.
Functional scales; theory and construction of nomographic charts for three or more variables; graphical integration and differentiation. Representation and analysis of experimental data.
113. The Engineer and His Professional Development. (2) I and II.
Mr. VOGT 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.

* Not to be given, fall semester, 1946–1947.

115. Reversed Thermodynamic Cycles and Refrigeration. (3) I. Mr. THOMSEN
 Prerequisite: course 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. RABER
 Prerequisite: course 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. THOMSEN
 Prerequisite: course 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. (Formerly 115, sec. 2.)
118. Industrial Power-Plant Design. (3) II. Mr. RABER
 Prerequisite: course 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. (Formerly 116, sec. 2.)
120. Principles of Engineering Investment and Economy. (3) I and II. Mr. DEGARMO
 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) I. Mr. IVERSEN
 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 in charge
 Prerequisite: course 105A-105B. Course 170 is recommended.
 (A) Engine cycles, performance, fuels, carburetion, heat transfer.
 (B) Injection systems, valves and cams, lubrication, dynamics.
- 124A-124B. Mechanical Engineering. (2-2) Yr. Mr. VOGT in charge
 Prerequisite: course 131A-131B must be taken concurrently.
 Review of mechanical engineering, including lectures closely integrated with experimental work in course 131A-131B. (After 1946-1947 credit will be increased to 3-3.)

*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-128B. Marine Engineering. (3-3) Yr.

Mr. HOWE

Prerequisite: courses 102A-102B, 103, 105A-105B, and Civil Engineering 108A.

128A. Ship calculations with special consideration of displacement, stability, stress, hull resistance, and propeller thrust.

128B. 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.

Laboratory fee, \$17.50 a semester.

Mr. VOGT 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. In the second semester, students are permitted some specialization in subjects of the mechanical engineering options.

Properties and Application of Engineering Alloys. See Metallurgy 170A.

143. Time and Motion Study. (3) I and II.

Mr. DEGARMO

Prerequisite: senior standing in an engineering program of study or in the School of Business Administration. Laboratory fee, \$3.

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) II.

Prerequisite: senior standing in an engineering program of study or in the School of Business Administration. Fee, \$2.

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) II.

Mr. GRASSI

Two lectures and one two-hour laboratory period a week.

Prerequisite: senior standing in an engineering program of study and course 106 (may be taken concurrently).

The selection of tooling for production; design of tools, jigs, fixtures, dies and production type gages; design and tooling of automatic machines.

* Not to be given, 1946-1947.

151. Industrial Heat Transfer. (3) I. Mr. MARTINELLI, Mr. NELSON
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-152B. Industrial Mass Transfer. (3-3) Yr. Mr. ELA, Mr. SNYDER
Prerequisite: course 105A, 105B or equivalent. Course 151 and Chemistry 109 recommended.
Thermodynamic, heat, and mass transfer principles applied to process equipment involving evaporation, humidification, absorption and extraction, distillation, adsorption, drying, filtration, crystallization, mechanical separations, and materials handling.
154. Thermodynamics. (3) II. Mr. GROSSMAN
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. Mr. FOLSOM, Mr. PUTNAM
Prerequisite: course 103.
Turbulence, dynamical similarity, models, and hydraulic machinery.
162. Elementary Hydrodynamics. (3) II. Mr. O'BRIEN
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. ———
Prerequisite: courses 103 and 105A (course 161 is desirable).
Properties of mixtures and suspensions, plastic flow, two-phase flow, materials and pumping equipment.
164. Instrumentation and Automatic Control. (2) I. Mr. FOLSOM
Prerequisite: courses 103, 102B and 105A. Mathematics 110A-110B is desirable.
Descriptive and analytical study of instruments and fundamental mechanical control systems.
170. Mechanics of Machinery. (3) I. Mr. GARLAND
Prerequisite: course 102B and Mathematics 110A-110B.
Introduction to the theory of mechanical vibrations with applications to dynamic balancing, critical speeds, governed systems, and vibration isolation.
Formerly course 104A.

* Not to be given, 1946-1947.

171. Design of Mechanical Equipment. (3) I. Mr. KANE
Lecture and laboratory.
Prerequisite: course 106 and senior standing in an engineering program of study.
Continuation of course 106. 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) II. Mr. WEIBEL
Lectures and laboratory.
Prerequisite: 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 gages, photoelastic and other models.
173. Acoustics of Machinery. (3) II. Mr. SNYDER
(Formerly numbered 104B.)
Prerequisite: course 102B and Mathematics 110A-110B (course 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.
Prerequisite: senior standing in engineering. Mr. VOGT in charge
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.
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 146.

NOTE.—In addition, graduate students must have completed at least Mathematics 110A-110B before undertaking any of the following courses.

- 267A-267B. Heat Transfer. (3-3) Yr. Mr. MARTINELLI, Mr. H. A. JOHNSON
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) I. 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) II. Mr. FOLSOM
Prerequisite: graduate standing and course 161 or 162.
The design and performance of all types of pumping machinery.
- *272. Flow in Porous Media. (3) I. 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. O'BRIEN
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. FOLSOM, Mr. PUTNAM
Prerequisite: graduate standing. Mathematics 270 recommended.
Fundamentals of subsonic and supersonic flow, shock waves, different theoretical methods, laboratory equipment, and procedures for supersonic investigations.
- 284A-284B. Advanced Dynamics of Machinery. (3-3) Yr. Mr. GARLAND
Prerequisite: graduate standing and course 104.
Transient response and acceleration, linear and nonlinear systems, and applications of LaGrange's equations.
- 285A-285B. Applied Elasticity. (3-3) Yr. Mr. WEIBEL
Prerequisite: graduate standing.
Introduction to the mathematical theory of elasticity and flat plate theory, elastic stability, and advanced design applications involving elasticity.
298. Group Studies, Seminars or Group Research. (1-5) I and II.
(Formerly numbered 218.) Mr. VOËT 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.
299. Individual Study or Research. (1-5) I and II. Mr. VOËT in charge
(Formerly numbered 219.)
Investigation of advanced mechanical engineering problems. Students enrolled in this course will attend the weekly research conference.

* Not to be given, 1946-1947.

MINING

LOWER DIVISION COURSES

1. Mine Surveying. (3) I and II. Mr. WEEKS, Mr. YORK
 Prerequisite: Engineering 1A-1B.
 Surface and underground mine surveys. Preparation of mine maps.

UPPER DIVISION COURSES

103. Prospecting, Exploration, and Exploitation. (3) I. _____
 Prerequisite: Mineralogy 4A-4B, Geology 1A, Mathematics 4B; Geology 106 recommended.
 Mining law, prospecting, exploration methods, ground behavior, ground support, shaft sinking, and mining methods.
- 105A. Mining Machinery and Equipment. (4) I. Mr. WEEKS
 Two lectures and two laboratory periods.
 Prerequisite: Engineering 14; Mechanical Engineering 102A-102B; 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 14, 35. Mechanical Engineering 102A-102B. Electrical Engineering 101. Discussion of power, transportation, drainage, ventilation, and lighting.
107. Valuation of Mines. (3) II. Mr. YORK
 Prerequisite: Mining 103.
 Sampling and ore estimation, expenses, rates of production, marketing, mine finance, mine taxation, purchase and leasing contracts.
109. Administrative and Operating Records and Reports. (2) I. Mr. YORK
 Prerequisite: Mining 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.
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. Study groups may be organized in advanced mining subjects.
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 146.

201. Investigations in Mining Practice. (2-3) I and II. Mr. WEEKS, 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)
299. Individual Study or Research. (1-5) I and II.
Prerequisite: graduate status. The STAFF (Mr. YORK in charge)

PETROLEUM ENGINEERING

UPPER DIVISION COURSES

Course 117 is prerequisite to courses 119, 121A-121B, 123A-123B, 125, 129, and 133.

117. The Petroleum Industry. (2) I. Mr. CARLSON
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, Mr. SOMERTON
Laboratory practice in determining physical and chemical properties of natural gas, petroleum, and its products, 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. (2) 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 formation and core samples from drilling wells, oil-well cements, drilling fluids, and ground waters associated with oil deposits.
- 123B. Petroleum Engineering Laboratory. (2) II. Mr. SOMERTON
Prerequisite: course 119. Complementary to course 121B, which should be taken concurrently.
Investigation of special problems in the production, transportation and storage of petroleum. Laboratory studies of petroleum production methods and of factors influencing drainage of oil from reservoir rocks; formation and dehydration of petroleum emulsions.

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) II. Mr. CARLSON
Lecture and laboratory.
Prerequisite: Engineering 1A-1B, 22 and 23, Petroleum Engineering 121A (may be taken concurrently).
Preparation of field and property maps and well logs. Development of geologic sections, structure—contour maps and peg models from well log data.
129. Production and Utilization of Natural Gas. (2) I. Mr. SOMERTON
Control and management of gas wells; separation of gas from oil; gauging, compression and transmission of natural gas; its utilization in developing light, heat and power; extraction of gasoline from natural gas.
133. Petroleum Refining Technology. (2) I. Mr. CARLSON
Lecture and laboratory.
Prerequisite: course 119.
Modern refining practice as related to petroleum industry. Technology of treating and refining processes applied to different crude oils.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II. The STAFF
Time to be arranged.
Prerequisite: senior standing in engineering.
Group study of selected topics. Study groups may be organized in advanced petroleum engineering subjects.
199. Individual Study for Advanced Undergraduates. (1-5) I and II. The STAFF
Prerequisite: senior standing in engineering.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

- 207A. Seminar in Petroleum Production Technology. (2) I. Mr. UREN
Prerequisite: course 121A-121B. May be repeated without duplication of credit.
Seminar topics will be changed each year.
- 207B. Seminar in Fundamentals of Petroleum Production. (2) II. Mr. CARLSON
Prerequisite: courses 121A-121B, 123A-123B; Mathematics 110; Chemistry 109.
Subsurface conditions in reservoirs and wells. Thermodynamics and kinetic properties of reservoir fluids. Phase relationships of hydrocarbons. Application of engineering principles to economic production.

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213. Valuation of Oil- and Gas-Producing Properties. (2) II. Mr. UREN
Prerequisite: Petroleum Engineering 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.
299. Individual Study or Research. I and II. The STAFF
Credits and hours to be arranged.
Prerequisite: graduate status.

METALLURGY

LOWER DIVISION COURSES

- 2A. Metallurgical Analysis. (3) I. Mr. MITCHELL
(Formerly numbered 2.)
One lecture and two laboratory periods.
Prerequisite: Chemistry 1B with grade C or higher. Laboratory fee, \$17.50.
Quantitative analysis of ores, metals and metallurgical products.
- 2B. Metallurgical Analysis. (3) II. Mr. MITCHELL
(Formerly numbered 104.)
One lecture and two laboratory periods.
Prerequisite: course 2A and Mineralogy 4A. Laboratory fee, \$17.50.
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

102. General Metallurgy. (2) I. Mr. DUSCHAK
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, Mr. HULTGREN
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 20 students.
Prerequisite: course 108. Laboratory fee, \$9.
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. Laboratory fee, \$9.
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. DUSCHAK
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 in engineering, chemistry, or equivalent.
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.
- 150A. Physical Metallurgy. (3) I. Mr. HULTGREN
Two lectures and one laboratory period.
Prerequisite: Chemistry 1A-1B. Physics 4A, 4B, 4C. Laboratory fee, \$9.
Relationships between microstructure, composition, heat and mechanical treatment, and physical properties of metals and alloys. The metallic state, phase diagrams and interpretation of microstructures from them, deformation and recrystallization of metals, metallography and heat treatment of iron and steel.
- 150B. Physical Metallurgy. (3) II. Mr. HULTGREN
Two lectures and one laboratory period.
Prerequisite: course 150A. Laboratory fee, \$9.
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. (2) I. Mr. HULTGREN
Prerequisite: Chemistry 1A-1B, Physics 4A, 4B, 4C.
The lecture part of course 150A.
- 152L. Physical Metallurgy Laboratory. (1) I. Mr. HULTGREN
Prerequisite: open only to students who have had course 152 in a previous year. Laboratory fee, \$9.
The laboratory part of course 150A.

154. Advanced Metallography. (3) II. Mr. PARKER
 Prerequisite: Metallurgy 150A, 150B, 106. Laboratory fee, \$17.50.
 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. Laboratory fee, \$9.
 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 Metallurgy 150A or Engineering 10A.
 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: Metallurgy 170A.
 A study of the application of the principles of elasticity, plasticity, and the properties of metals to the solution of problems in machining and plastic forming of metals.
172. Inspection of Metals. (2) I. Mr. PARKER
 Prerequisite: Metallurgy 150A or Engineering 10A. Laboratory fee, \$9.
 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. Metal Technology. (3) II. Mr. DORN
 Prerequisite: Metallurgy 150A and Civil Engineering 108A.
 A study of the application of the principles of equilibrium, 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.
 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.
 Time to be arranged. The STAFF (Mr. DUSCHAK in charge)
 Prerequisite: senior standing in engineering.
 Group study of selected topics. Study groups may be organized in advanced metallurgical subjects.

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 146.

- †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: Metallurgy 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
Lecture and laboratory.
Prerequisite: Metallurgy 160 and graduate standing.
Preparation of metallic single crystals, stress strain relationships for crystals having different orientations, theories of strain hardening, internal friction, magnetic properties, preferred orientation in polycrystalline materials, orientation determination and pole figures, relation between properties of single crystal and polycrystalline materials.
298. Group Studies, Seminars, or Group Research. I and II.
The STAFF (Mr. DUSCHAK in charge)
Credits and hours to be arranged.
Prerequisite: graduate standing.
299. Individual Study or Research. I and II.
The STAFF (Mr. DUSCHAK in charge)
Credits and hours to be arranged.
Prerequisite: graduate standing.

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

ENGLISH

- ² MYRON F. BRIGHTFIELD, Ph.D., Professor of English.
 ARTHUR G. BRODEUR, Ph.D., Professor of English and Germanic Philology.
 BERTRAND H. BRONSON, Ph.D., Professor of English.
 JAMES R. CALDWELL, Ph.D., Professor of English.
 WILLARD H. DURHAM, Ph.D., Professor of English.
¹ 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.
 GEORGE R. POTTER, Ph.D., Professor of English.
² GEORGE R. STEWART, Ph.D., Professor of English.
 WALTER M. HART, Ph.D., LL.D., Professor of English, Emeritus.
 JOHN S. P. TATLOCK, Ph.D., Litt.D., LL.D., Professor of English, Emeritus.
 G. DUNDAS CRAIG, M.A., Litt. D., Assistant Professor of English, Emeritus.
 JAMES M. CLINE, Ph.D., Associate Professor of English.
 GORDON MCKENZIE, Ph.D., Associate Professor of English.
 MARK SCHORER, Ph.D., Associate Professor of English.
 BERTRAND EVANS, Ph.D., Assistant Professor of English and Education.
 † JAMES D. HART, Ph.D., Assistant Professor of English.
 ARTHUR E. HUTSON, Ph.D., Assistant Professor of English.
 EDWARD S. LECOMTE, Ph.D., Assistant Professor of English.
 JOSEPHINE MILES, Ph.D., Assistant Professor of English.
 ROY H. PEARCE, Ph.D., Assistant Professor of English.
 C. WAYNE SHUMAKER, Ph.D., Assistant Professor of English.
 WAYNE BURNS, Ph.D., Instructor in English.
 BREWSTER ROGERSON, Ph.D., Instructor in English.

ROSSITER H. BELLINGER, M.A., Lecturer in English.
 LYNN B. BENNION, A.B., Lecturer in English.
 GEORGE HINKLE, Ph.D., Lecturer in English.
 IRVING MCKEE, Lecturer in English.
 JOHN H. RALEIGH, 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 81.

Alternative programs for the undergraduate major have been adopted: a program for students who intend to become, later, candidates for the M.A. or Ph.D. in English; and a program for all other students.

† Sabbatical leave in residence for the second semester, 1946-1947.

¹ In residence first semester only, 1946-1947.

² In residence second semester only, 1946-1947.

Departmental Major Advisers: Mr. CALDWELL, Chairman; Mr. J. D. HART, Mr. LÉCOMTE, Mr. ROGERSON, Mr. SHUMAKER.

Plan I. The program for the general undergraduate is as follows:

(A) *Preparation for the Major.*—First Year—Required: English 1A-1B (3-3), Composition and Study of Literature. Second Year—Required: English 46A-46B (3-3) and 3 additional units to be elected from the following courses: English 30 (3), English 41A-41B (3-3), English 25 (3), English 44A-44B (3-3).

(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 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., in English is as follows:

(A) *Preparation for the Major.*—First Year—Required: English 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 cannot maintain such an average may be required at any time to withdraw from the major in English.

Honor Students in the Senior Year.—See Honors course, page 284.

Teacher Training.—Consult Mr. R. B. Evans; see also the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Higher Degrees.—Consult Mr. B. H. Bronson; 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 either semester. Mr. BENNION, Mr. BRIGHTFIELD, Mr. BRONSON, Mr. BURNS, Mr. CALDWELL, Mr. CLINE, Mr. EVANS, Mr. FARNHAM, Mr. HART, Mr. HUTSON, Mr. LÉCOMTE, Mr. LEHMAN, Mr. MCKENZIE, Miss MILES, Mr. MONTGOMERY, Mr. PEARCE, Mr. RALEIGH, Mr. ROGERSON, Mr. SCHORER, Mr. SHUMAKER, Mr. STEWART, 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. 1A is prerequisite to 1B.

SOPHOMORE COURSES

25. Language. (3) I. Mr. HUTSON
The origins and symbols of human speech; patterns, change, and growth in language; the interrelations of language, thought, and civilization. Emphasis on English, as written and spoken in England and America. Designed for sophomores, but open to students in the upper division.
30. Introduction to American Literature. (3) II. Mr. STEWART
- 41A-41B. Writing in Connection with the Reading of Important Books of the 19th and 20th Centuries. (3-3) Yr. Mr. LEHMAN
41A is not prerequisite to 41B.
- 44A-44B. Masterpieces of Literature. (3-3) Yr. Mr. LECOMTE
Lectures on great works of the world's literature.
44A is not prerequisite to 44B.
- 46A-46B. Survey of English Literature. (3-3) Yr.
Mr. CALDWELL, Mr. CLINE, Mr. DURHAM, Mr. MCKENZIE,
Mr. ROGERSON.
Prerequisite: course 1A-1B.
One lecture each week will present the more important aspects of the history of English literature. In semiweekly sections limited to forty students typical work of the more significant authors from Chaucer to Hardy will be discussed.

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. 153A is not prerequisite to 153B.
154. Master Spirits of Literature: Great Dramatists, Ancient and Modern. (3) I. Mr. DURHAM
- 114A-114B. The English Drama. (3-3) Yr. Mr. DURHAM
(A) From the miracle plays to 1642. (B) From 1642 to the present.
114A is not prerequisite to 114B.
- *125C-125D. The Novel. (3-3) Yr. Mr. BRIGHTFIELD
125C is not prerequisite to 125D.
- *113. The History of English Criticism. (3) II. Mr. BRIGHTFIELD
116. The English Bible as Literature. (3) II. Mr. POTTER
- 117A-117B. Shakespeare. (3-3) Yr. Mr. FARNHAM, Mr. MONTGOMERY
117A: (Farnham). 117B: (Montgomery).
Lectures on the entire works of Shakespeare, including nondramatic poems. Open to both majors and nonmajors. 117A is not prerequisite to 117B.

* Not to be given, 1946-1947.

- 117E. Shakespeare. (3) I. Mr. MONTGOMERY
Lectures on fifteen plays of Shakespeare. May not be taken by students
whose major is English.
155. The Age of Chaucer. (3) I. Mr. BRODEUR
156. The Age of Elizabeth. (3) I. Mr. CLINE
157. The Age of Milton. (3) II. Mr. POTTER
166. The Age of Swift and Pope. (3) I. Mr. MONTGOMERY
119. The Age of Johnson. (3) II. Mr. BRONSON
- *121. The Romantic Period. (3) II. Mr. CALDWELL
122. The Victorian Period. (3) II. Mr. MCKENZIE
123. Nineteenth-Century Prose. (3) I. Mr. SHUMAKER
160. British Literature from 1900 to the Present. (3) II. Mr. SCHORER
- 130A. American Literature before 1840. (2) I. Mr. PEARCE
- 130B. American Literature: 1840-1888. (3) I. Mr. HART
- 130C. American Literature: 1885 to the Present. (3) II. Mr. PEARCE
110. The English Language. (3) II. Mr. BRIGHTFIELD

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. CALDWELL, Mr. MCKENZIE, Miss MILES, Mr. POTTER,
Mr. ROGERSON, Mr. SCHORER, 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.

Prerequisite: course 100.

- 151L. Chaucer. (3) I and II. Mr. BRONSON, Mr. CLINE, Mr. HUTSON
I: (Bronson).
II: Sec. 1 (Cline); Sec. 2 (Hutson).
- 151S. Shakespeare. (3) I. Mr. EVANS
- 151M. Milton. (3) II. Mr. SHUMAKER
- 151J. Donne and Milton. (3) I. Mr. POTTER

* Not to be given, 1946-1947.

- 151g. Dickens. (3) II. Mr. BURNS
 151w. Whitman. (3) I. _____
 151k. T. S. Eliot. (3) I and II. Miss MILES, Mr. CALDWELL

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 not less than 9 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 frequent conferences with the instructor. This work will be accepted as the equivalent of from 1 to 3 units (amount of credit to be determined by the instructor).

D. THE COURSE IN COMPOSITION

(Open only to upper division students who have the consent of the instructor.)

- 106A. The Short Story. (3) I. Mr. SCHORER
 106B. Verse. (3) II. Miss MILES
 106E. Biographical Narrative. (3) II. Mr. STEWART
 106H. Expository Writing. (3) I and II. Mr. BURNS, _____
 I: (——) (Burns).
 II: (——) (——).
 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. Mr. ROGERSON
 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 two three-hour papers, the second of which will take the form of an essay. The Board of Examiners will set the questions, and at its discretion may supplement them with an oral examination. The student should attend the general conferences held by the board, and may also consult individually with the members of the board. The student's preparation for this examination will presumably extend throughout the entire period of his upper division residence. Upon the student's passing the examination, however, the grade assigned by the department, with the appropriate grade points, will be recorded. Given in the fall and spring semesters and in the summer sessions; credit, 3 units.

Mr. MCKENZIE, Mr. CALDWELL, Mr. LECOMTE

TEACHERS' COURSE

300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I. Mr. EVANS

For seniors and graduate students offering an English teaching major or minor. Should be taken before practice teaching. This course will be 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 146.

Except upon special permission of the instructor, only students who have passed the department's examination in French or in German will be admitted to any seminar.

French 206A-206B and German 265 are especially recommended to candidates for higher degrees. Attention is directed to German 201.

The following courses will be given as seminars: 210, 217, 218, 225, 230, 247, 251, 254A-254B, 258, 262B, 263A-263B.

Attention is directed to the fact that the period courses, 155, 156, 157, 119, 121, and 122, are particularly adapted to graduate study.

200. Techniques of Literary Scholarship. (3) I and 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.
- †204B. Celtic Studies. (3) I and II. Mr. HUTSON
- 211A. Old English Literature. (3) I. Mr. BRODEUR
Open to seniors by consent of the instructor.
Rapid reading of Old English texts.
- 211B. The Beowulf. (3) II. Mr. BRODEUR
- 211G-211H. Old and Middle English. (3-3) Yr. Mr. BRODEUR
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) II. Mr. CLINE
Some knowledge of Chaucer and his language is presupposed.
217. Studies in Shakespeare. (3) II. Mr. DURHAM
- 254A-*254B. Elizabethan Drama. (3-3) Yr. Mr. FARNHAM
218. Milton. (3) II. Mr. LECOMTE
258. Johnson and His Contemporaries. (3) I. Mr. BRONSON
251. Romantic Poets. (3) I. Mr. CALDWELL

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

* Not to be given, 1946-1947.

- *252A. English Prose Fiction before 1740. (3) II. Mr. BRIGHTFIELD
 225. The Popular Ballad. (3) II. Mr. BRONSON
 230. American Literature. (3) I. Mr. HART
 262B. Nineteenth Century Literature. (3) II. Mr. LEHMAN
 263A-263B. Literary Criticism in the Nineteenth Century. (3-3) Yr.
 Mr. KURTZ
 247. Poetics. (3) II. Miss MILES
 Special reference to an historical period, to be selected.

260A-260B. Special Study. (1-4; 1-4) Yr. Beginning each semester.
 The STAFF (Mr. BRONSON 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).
9. Shakespeare, Donne, Sixteenth and Seventeenth Centuries (Cline, Farnham, LeComte, Potter).
10. Eighteenth Century (Bronson, Montgomery, Schorer).
11. Nineteenth Century (Brightfield, Caldwell, Kurtz, LeComte, Lehman, McKenzie).
12. American Literature (Hart, Stewart).

* Not to be given, 1946-1947.

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 178. Greek and Roman Mythology.

180A-180B. The Latin Classics in English.

Dramatic Art 157A-157B. Modern European Drama.

French 9A-9B. 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.

Scandinavian Languages 100A-100B. History of Scandinavian Literature.

Slavic Languages 130. Russian Literature of the Nineteenth Century.

131. Recent Russian Literature.

132. Russian Literature since 1917.

134. Russian Literature and Folklore.

138. Modern Russia.

FORESTRY

FREDERICK S. BAKER, F.E., Professor of Forestry.

**JOSEPH KITTRIDGE, Ph.D., Professor of Forestry.

MYRON E. KRUEGER, M.S., Professor of Forestry.

WALTER MULFORD, F.E., Sc.D., Professor of Forestry (Chairman of the Department).

ARTHUR W. SAMPSON, Ph.D., Professor of Forestry.

PERCY M. BARR, Ph.D., Sc.D., Associate Professor of Forestry.

ROBERT A. COCKRELL, Ph.D., Associate Professor of Forestry.

EMANUEL FRITZ, M.E., M.F., Associate Professor of Forestry.

R. KEITH ARNOLD, M.F., Associate 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 81.

Laboratory Fees.—A fee of \$2.50 is charged in courses 107 and 114.

LOWER DIVISION COURSE

*1. Elements of Forestry. (3) I.

Mr. COCKRELL

Not open to students with a major in forestry.

Forests in their relation to national life. The life history of the tree and the forest. General principles of forestry.

UPPER DIVISION COURSES

Forestry 105A-105B is prerequisite to all courses which require senior standing. An average grade of C or higher in all work undertaken is prerequisite to all upper division courses in forestry.

100. Introduction to Professional Forestry. (3) I.

Mr. COCKRELL

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.

Prerequisites: Engineering 1A-1B; Chemistry 8; an elementary course in statistics; Forestry 103 or Botany 151. The additional prerequisites of Forestry 101 and Botany 108 may be taken concurrently.

Advanced work in range management. Special field trips will be arranged.

103. Principles of Forest Ecology. (3) I.

Mr. BAKER

Prerequisite: Botany 1A-1B or 12, Chemistry 1A.

Structure of the plant as modified by conditions of habitat. Plant succession and societies.

** Absent on leave, 1946-1947.

* Not to be given, 1946-1947.

104. Silviculture. (4) I. Mr. BAKER
 Lectures and laboratory, and two all-day field trips.
 Prerequisite: Forestry 103; 105A-105B.
 Methods of governing growth and reproduction of forests through the application of ecological laws.
- 105A. Field Laboratory Course. No credit. Mr. ARNOLD
 Prerequisite: Engineering 1A-1B, Forestry 103, 110.
 Six weeks' summer camp at Meadow Valley, near Quincy, in the Plumas National Forest.
 Field laboratory work in forest surveys and mapping, forest mensuration, silviculture, logging and milling operations.
- 105B. Field Laboratory Course. No credit. Mr. ARNOLD
 Prerequisite: Engineering 1A-1B, Forestry 103, 110.
 Continuation of 105A. Six weeks' summer camp, following 105A.
 105A-105B is required of all students.
106. Forest Planting. (1) I. Mr. BAKER
 Prerequisite: Botany 1A-1B or 12, Economics 1A-1B.
 Artificial establishment of forests, from collection of seed to planting the trees; financial aspects of forest plantations.
107. Forest Planting. Laboratory. (1) I. Mr. BAKER
 Prerequisite: Botany 1A-1B or 12, Economics 1A-1B. Fee, \$2.50.
 Limited to 25 students.
 Laboratory exercises relating to the artificial establishment of forests.
108. Dendrology. (4) I. Mr. COCKRELL
 Recitation sections and laboratory.
 Prerequisite: Botany 1A-1B or 12.
 Identification by gross characters of important forest trees of North America; their ecological and geographical distribution; character of wood.
110. Forest Mensuration. (3) II. Mr. BARR
 Lectures and conferences.
 Prerequisite: a course in elementary statistics; 3 units of College mathematics.
 Statistical methods useful in analyzing forestry data; the measurement of timber in the log, the tree, and the stand; growth of trees and stands.
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 1A-1B or 12. Fee, \$2.50.
 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.

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: Forestry 104, 105A-105B, and 110.
Organization of properties for forestry practice. Timber production as a business.
121. Forest Economics. (3) II. _____
Lectures and conference.
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) II. Mr. MULFORD
Prerequisite: 6 units of economics and senior standing.
Forests in their relation to society. State and national forest policies.
123. Range Utilization. (3) II. Mr. SAMPSON
Prerequisite: Forestry 101, 102, and 103, Engineering 1A-1B, Botany 108 and 120A, and senior standing.
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: Forestry 103, Physics 2A-2B; senior standing; Soil Science 100 and Geography 111 recommended.
The influences of forests and brush on soil moisture, run-off, stream flow, floods, erosion, local climate, and soil productivity for forest growth.
126. Production Methods in the Forest Industries. (3) II. Mr. KRUEGER
Prerequisite: 6 units of economics and senior standing.
Production methods and principles involved in logging; cost analyses.
128. Forest Protection. (2) II. Mr. ARNOLD
Open only to students whose major is forestry.
Forest fire control organization and equipment; methods of fire prevention and suppression; damage to forests and watersheds from fire and other destructive influences.
198. Directed Group Study. (1-5) I and II.
The STAFF (Mr. MULFORD in charge)
Prerequisite: senior standing, and approval of the instructor.
Group study, or investigation, of special problems.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. MULFORD in charge)
Prerequisite: senior standing, and approval of instructor.
This course may also be taken during the summer at the Forestry Camp at Meadow Valley, Plumas County.

* Not to be given, 1946-1947.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

- 201A*-201B. Seminar in Forestry. (2-2) Yr. Mr. KRUEGER
201A is not prerequisite to 201B.
- 202A-202B. Research in Forestry. (1-6; 1-6) Yr.
202A is not prerequisite to 202B. The STAFF (Mr. MULFORD in charge)
- 203A*-203B. Seminar in Forest Influences and in Forest Ecology. (2-2) Yr.
I: (Kittredge). II: (Sampson). Mr. KITTREDGE, Mr. SAMPSON
Prerequisite: Plant Physiology (3 units); Forestry 125 for 203A; Forestry 103 and Chemistry 8 for 203B. 203A is not prerequisite to 203B.
204. Seminar in Silviculture. (2) I. Mr. BAKER
Prerequisite: Forestry 104.
205. Seminar in Wood Technology. (2) I. Mr. COCKRELL
Prerequisite: Forestry 114.
Anatomy and properties of wood.
206. Seminar in Forest Management. (2) II. Mr. BARR
Prerequisite: Forestry 120, 6 units of economics.
- 207A-207B. Seminar in Forest Economics. (2-2) Yr. ———, Mr. KRUEGER
I: (———). II: (Krueger).
Prerequisite: 12 units of economics, agricultural economics, or forest economics.
207A is not prerequisite to 207B.
208. Seminar in Range Management. (2) II. Mr. SAMPSON
Prerequisite: Forestry 103, 123, Plant Physiology (3 units), Chemistry 8.

* Not to be given, 1946-1947.

FRENCH

- GABRIEL BONNO, Docteur ès Lettres, Professor of French.
 PERCIVAL B. FAY, Ph.D., Professor of French.
 CLIFFORD H. BISSELL, Ph.D., Associate Professor of French.
 CLARENCE D. BRENNER, Ph.D., Associate Professor of French.
 FRANCIS J. CARMODY, Ph.D., Associate Professor of French.
 *JACQUELINE DE LA HARPE, Docteur ès Lettres (Lausanne), Associate Professor of French.
¹MATHURIN DONDO, Ph.D., Associate Professor of French.
 EDWARD F. MEYLAN, Ph.D., Associate Professor of French.
 ARNOLD H. ROWBOTHAM, Ph.D., Associate Professor of French (Chairman of the Department).
 HAAKON M. CHEVALIER, Ph.D., Assistant Professor of French.
 ALFRED SOLOMON, M.A., Assistant Professor of French.
 RONALD N. WALPOLE, Ph.D., Assistant Professor of French.
 MARIE-LOUISE DUFRENOY, Ph.D., Associate in French.
 ALICE HABIS-REUTINGER, Ed.D., Associate 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 81.

Departmental Major Adviser: Mr. BISSELL.

Preparation for the Major.—French 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 25.) History 4A-4B, Philosophy 10A-10B, English 1A-1B, and Latin are strongly recommended.

The Major.—Required: French 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; however, with the permission of the department, 4 units of the 24 may be satisfied by the course 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.

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.

1. Elementary French. Beginners' Course. (4) I and II.

Sections meet five hours weekly.

Mr. CARMODY in charge

¹ In residence fall semester only, 1946-1947.

* Absent on leave, 1946-1947.

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. WALPOLE in charge
Sections meet five hours weekly.
Prerequisite: three years of high school French, or course 2.
4. Intermediate French (continuation of 3). (4) I and II.
Sections meet five hours weekly. Mr. MEYLAN in charge
Prerequisite: four years of high school French, or course 3.
8. Intermediate French, Reading. (4) I and II. Mr. MEYLAN in charge
Reading and translation; reports and conferences.
Prerequisite: French 3 or four years of high school French. Not open to
students who wish to take course 25 or upper division work.
25. Advanced French. (3) I and II. Mr. MEYLAN in charge
Prerequisite: French 4.
- 9A-9B. French Literature in English Translation. (2-2) Yr. Mr. ROWBOTHAM
Two sections.
Lectures (in English) and collateral reading of representative works
in English translation. Open to all students; no knowledge of French
required.

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 25.

Courses 101A-101B and 109A-109B must usually be taken before any other upper division course, except 125.

- 101A-101B. Intensive Reading, Grammar and Composition. (3-3) Yr. Begin-
ning each semester. Mr. FAY, Mr. BISSELL, Mr. MEYLAN
- 109A-109B. A Survey of French Literature from the Middle Ages to the Pres-
ent. (3-3) Yr. Mr. DONDO, Mr. ROWBOTHAM
- 112A-112B. The Nineteenth Century. (2-2) Yr. Mr. BONNO
- 114A-114B. Contemporary French Literature. (2-2) Yr. Mr. CHEVALIER
- *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
- 122A-122B. Readings in French Literature of the Middle Ages. (2-2) Yr.
Mr. WALPOLE

Open to all upper division students. Knowledge of French is recom-
mended but not required.

* Not to be given, 1946-1947.

125. The Pronunciation of French. (1) I. Mr. CARMODY
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 15 students.
- 130A-130B. Advanced Grammar and Composition. (3-3) Yr. Mr. BISSELL
Prerequisite: course 101A-101B.
Required of all candidates for the Certificate of Completion of the teacher-training curriculum, or for the M.A. degree.
- 134A-134B. Survey of French Culture and Institutions. (2-2) Yr. Mr. DONDO
Required of all candidates for the Certificate of Completion in French.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The STAFF (Mr. BRENNER in charge)
Consultations in regard to individual investigations in philological or literary fields.

TEACHERS COURSE

300. Problems in the Teaching of French. (2) I. Mr. MEYLAN
Prerequisite: courses 130AB and 134AB, or permission of the instructor.
Required of all candidates for the Certificate of Completion in French; should be completed before practice teaching. This course will be accepted in partial satisfaction of the requirement in education for the Certificate of Completion of the teacher-training curriculum.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

Course 201A or 206A is required of all candidates for the M.A. degree.

- 201A-201B. Historical Grammar. (3-3) Yr. Mr. CARMODY
- *202A-202B. Studies in Mediaeval French Literature. (2-2) Yr. Mr. WALPOLE
- *204A-204B. Studies in the French Eighteenth Century. (2-2) Yr.
I. Voltaire and the Philosophers. Mr. ROWBOTHAM
II. Jean-Jacques Rousseau.
Courses 204A-204B, 207A-207B, 210A-210B will be offered in rotation, one each year.
- 206A-206B. Reading and Interpretation of Typical Old French Texts. (2-2) Yr. Mr. FAY
- *207A-207B. Studies in the Eighteenth-Century Novel. (2-2) Yr. Mr. ROWBOTHAM
- 210A-210B. Studies in the Eighteenth-Century Drama. (2-2) Yr. Mr. BRENNER
- 214A-*214B. French Versification. (2-2) Yr. Mr. DONDO
- *217A-217B. Studies in the French Renaissance. (2-2) Yr. Mr. MEYLAN

* Not to be given, 1946-1947.

- 218A-218B. French Classicism. (2-2) Yr. Mr. BONNO
- *219A-219B. Aspects of French Romanticism. (2-2) Yr. Mr. DONDO
- 220A-220B. Explication de Textes. (2-2) Yr. Mr. BONNO
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)

* Not to be given, 1946-1947.

GEOGRAPHY

JOHN B. LEIGHLY, Ph.D., Professor of Geography.

CARL O. SAUER, Ph.D., Professor of Geography (Chairman of the Department).

*JAN O. M. BROEK, Ph.D., Associate Professor of Geography.

JOHN E. KESSELI, Ph.D., Associate Professor of Geography.

ALFRED H. DEVRIES, Lecturer in Map History.

¹ EDWIN H. HAMMOND, M.A., Lecturer in Geography (for the fall semester).

² JAMES J. PARSONS, M.A., Lecturer in Geography (for the spring semester).

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 81.

Departmental Major Adviser: Mr. LEIGHLY.

Preparation for the Major.—Required: Geography 1, 2, and 4. Recommended: Geography 5A–5B, Botany 12, Geology 1A, and a course in elementary statistics.

The Major.—Twenty-four 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; Botany 151; Economics 112, 113, 188A, 190A–190B; Forestry 103, 125; Genetics 100; History 161A–161B, 176A–176B, 191A–191B; Social Institutions 121A–121B; Soil Science 100, 101, 103.

Each program should normally include Geography 101, 105A, 121, and 151.

Honor Students in the Upper Division.—Candidates for honors in geography must take course 151 and present a thesis on a subject related to the work in this course.

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. (2) I. Mr. KESSELI
One lecture and two laboratory hours weekly.
- 5A–5B. Economic Geography. (3–3) Yr. Mr. HAMMOND, Mr. PARSONS
Two lectures and two section meetings weekly.
The distribution of the world's resources and industries. (A) Agricultural production in its regional differentiation. (B) Mineral resources, manufacturing regions, trade routes, and trade centers.

UPPER DIVISION COURSES

101. Field Geography. (3) II. Mr. KESSELI
Field study of a unit area with systematic mapping of the elements that constitute the natural region and of the forms of its utilization. Registration only after consultation with the instructor.

* Absent on leave, 1946–1947.

¹ In residence fall semester only, 1946–1947.

² In residence spring semester only, 1946–1947.

- 105A-105B. Cartography. (3-3) Yr. Mr. LEIGHLY
The consent of the instructor must be obtained before enrollment.
One lecture hour and six laboratory hours weekly.
107. Map History and Map Appreciation. (1) II. Mr. DEVRIES
108. Analysis of Land Forms. (3) I. Mr. HAMMOND
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
The identification and classification of data on air photographs. The solution of selected problems in photogrammetry, including cover and relief.
111. Elementary Meteorology. (3) I. Mr. LEIGHLY
- *112. Dynamic Meteorology. (3) II. _____
Prerequisite: Geography 111 or its equivalent; knowledge of differential and integral calculus, and consent of the instructor.
113. Climatology. (3) II. Mr. LEIGHLY
Prerequisite: course 111 or consent of the instructor.
121. Geography of North America. (3) I. Mr. ROSTLUND
- 122A. Geography of Middle America. (3) I. Mr. SAUER
- 122B. Geography of South America. (3) II. Mr. SAUER
- 123A. Geography of Mediterranean Europe. (3) I. Mr. ROSTLUND
- 123B. Geography of Northern and Eastern Europe. (3) II. Mr. ROSTLUND
- 125A. Geography of India and Malaysia. (3) II. Mr. PARSONS
- 125B. Geography of China and Japan. (3) I. Mr. KESSELI
131. Geography of California. (3) II. Mr. KESSELI
- *141. Economic Geography: Primary Production. (3) I. Mr. BROEK
Analysis of the distribution of agricultural and mineral raw materials in relation to world commerce.
142. Economic Geography: Industrial Localization. (3) II. Mr. PARSONS
Factors and trends in the geographic distribution of manufacturing industries.
143. Political Geography. (3) I. Mr. HAMMOND
Discussion of the literature and the basic principles of political geography, followed by an analysis of geographic factors influencing the power relations of states: location, size, form, boundaries; human and material resources.
151. Principles of Geography. (2) I. Mr. LEIGHLY
Prerequisite: three upper division courses in geography.
Reports and conferences on the objectives, subdivisions, and methods of geography, with special reference to different schools of geographic thought as expressed in recent literature.

* Not to be given, 1946-1947.

153. Natural Resources and Their Exploitation. (3) II. Mr. SAUER
 Conservative and destructive uses of habitat (occupied area) by cultures (economic systems) throughout human time, with emphasis on contemporary problems.
161. Geography of Domesticated Plants and Animals. (3) I. Mr. SAUER
 A consideration of the processes, times, and places of appropriation of elements of flora and fauna into agricultural economics and of the successive geographic dispersal of the domesticated forms.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
 The STAFF (Mr. KESSELI, Mr. LEIGHLY in charge)

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

201. Seminar in Latin American Geography. (2) I. Mr. SAUER
203. Seminar in Cultural Geography. (2) II. Mr. SAUER
 The topics will deal with aboriginal economies.
- 205A. Seminar in Physical Geography. (2) I. Mr. KESSELI
 Topic: analysis of land forms.
- 205B. Seminar in Physical Geography. (2) II. Mr. LEIGHLY
 Topic: applied climatology.
- 219A-219B. Research. (2-2) Yr.
 The STAFF (Mr. SAUER, Mr. LEIGHLY in charge)

For facilities for research see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

GEOLOGICAL SCIENCES

PERRY BYERLY, Ph.D., Professor of Seismology.

ADOLF PABST, Ph.D., Professor of Mineralogy.

NICHOLAS L. TALIAFERRO, Ph.D., Professor of Geology.

HOWELL WILLIAMS, D.Sc., 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.

NORMAN E. A. HINDS, Ph.D., Associate Professor of Geology.

CARLTON D. HULIN, Ph.D., Associate Professor of Geology.

FRANCIS J. TURNER, D.Sc., Associate Professor of Geology.

CHARLES M. GILBERT, Ph.D., Assistant Professor of Geology.

Letters and Science List.—All undergraduate courses in geological sciences except 114 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Adviser: Mr. WILLIAMS.

Preparation for the Major.—Required: Chemistry 1A-1B; Physics 2A-2B; Engineering 1A-1B; Geology 1A-1B; Mineralogy 4A-4B; Mathematics 3A-3B; freehand and geometrical drawing. It is recommended that prospective major students take Engineering 11. 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.

Recommended: German and French, Spanish or Russian. A reading knowledge of French and German is required of candidates for the Ph.D. 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.

II. Emphasis on Mining Geology: Geology 104A-104B (6), 106 (3), 109 (3) and 114 (2), and one of the following: Geology 116 (2), Mineralogy 103 (2).

III. Emphasis on Petroleum Geology: Geology 104A-104B (6), 108 (2), and Paleontology 102, 103 (8) or 105A-105B (4). Recommended: Geology 110A 110B (4), 116 (2), 122 (2).

IV. Emphasis on Historical and Stratigraphic Geology: Geology 107 (2), 116 (2), Paleontology 102 (4), and two of the following courses: Paleontology 103, 104; Geology 104A, 104B, 209A, 209B.

V. Emphasis on Mineralogy: Mineralogy 103 (2), 105 (2), 107 (2), Geology 104A (3), Chemistry 109 (3), and one of the following courses: Geology 106, 109, 110A; Chemistry 122.

VI. Emphasis on Invertebrate Paleontology: Paleontology 102, 103 (8), Geology 107, 116 (4), and one of the following courses: Paleontology 104 (4), 105A-105B (4), Geology 104A (3).

VII. Emphasis on Geophysics: Geology 120 (2), 121 (4), 116 (2), 104A (3), 122 (2), and one of the following: Geology 104B, 107, Mathematics 119A, Physics 105A.

Laboratory Fees in Geology 104A, 104B, 109, 110A and 110B are \$6 a semester. In Mineralogy 4A-4B, \$3 a semester.

GEOPHYSICS

Departmental Major Adviser: Mr. BYERLY.

Preparation for the Major.—Required: Chemistry 1A; Geology 1A-1B, Mathematics 3A-3B, 4A-4B; Mineralogy 4A-4B; Physics 1A-1B, 1C-1D.

The Major.—Required: Electrical Engineering 106; Geology 102A-102B, 103, 121, 122; Mathematics 110A-110B; Physics 105A-105B, 110A-110B.

GEOLOGY

LOWER DIVISION COURSES

- 1A. General Geology: Dynamical and Structural. (3) I. Mr. HINDS
 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.
 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. TALIAFERRO, Mr. GILBERT,
Mr. HULIN, Mr. TURNER, Mr. WILLIAMS
One lecture a week and field trips Saturday, all day.
Prerequisite: Geology 103, which may be taken concurrently.
Students taking 102B may be called upon to make excursions entailing
an outlay of \$45.
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. GILBERT, Mr. HULIN, Mr. TURNER
Two lectures and one or two three-hour laboratory periods weekly.
Students in metallurgy, mining, and petroleum engineering will be re-
quired to take one afternoon of laboratory work for 3 units of credit.
Geology majors and students in the economic geology curriculum of the
College of Engineering will take two afternoons of laboratory work for 4
units of credit.
Prerequisite: Geology 1A, Mineralogy 4A-4B.
Characteristics, origin, mode of occurrence and nomenclature of rocks,
and description of the more common types. Laboratory practice in determi-
nation 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-4B, and for Geology 104B, Geology 103.
Fee, \$6 a semester.
The optical properties of crystals, followed by determination of minerals
and then of rocks by means of the microscope. Approximately one third of
the year is devoted to each of these three topics.
106. Economic Geology, Metalliferous Deposits. (3) I. Mr. HULIN
Three lectures weekly and occasional conference hours.
Prerequisite: Geology 103, which may be taken concurrently.
107. Historical 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) II. Mr. TALIAFERRO
Special emphasis is placed on petroleum.
Prerequisite: Geology 1A and Mineralogy 4A.

109. Microscopy of the Metallic Ores. (3) II. Mr. HULIN
 One lecture and two three-hour laboratory periods weekly.
 Prerequisite: Geology 106. Fee, \$6 a semester.
 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 Geology. (2-2) Yr.
 I: (Gilbert). II: (Turner). Mr. GILBERT, Mr. TURNER
 Two three-hour laboratory periods weekly.
 Prerequisite: Geology 104A. Fee, \$6 a semester.
 110A. Mechanical and mineralogical analysis of sediments and sedimentary rocks.
 110B. Discussion of the optical properties of minerals with special reference to methods for their determination in 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. If the subject chosen is properly approved, the completion of this course fulfills the thesis requirement for the degree of Bachelor of Science in the College of Engineering. 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. Tectonic 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 Field Course. (6) Mr. TALIAFERRO, Mr. GILBERT
 Prerequisite: Geology 102A-102B. Fee, \$35 for the summer of 1946.
 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 and Geophysics. (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, 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.
122. Principles of Geophysical Prospecting. (2) I. Mr. BYERLY
Prerequisite: Geology 1A, Mathematics 3B, and Physics 2A-2B or equivalent.
Fundamentals of seismic, gravitational, magnetic, and electrical methods of exploration of the earth's crust.
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 146.

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.
- 206A. 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 Igneous Geology. (2) II. Mr. WILLIAMS
The nature, classification, and mode of emplacement of intrusive igneous bodies.

- 209A-209B. Geology of California. (2-2) Yr. Mr. TALIAFERRO
Prerequisite: Geology 102A-102B, 103, and a course in historical geology, such as 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 will be 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.
Prerequisite: Geology 104A-104B.
(A) Dynamic metamorphic rocks. (B) Igneous and contact metamorphic rocks. These studies include petrofabric analyses by means of the universal stage.
Ordinarily only one of the two topics is offered in any one year, at the option of the class.
- 215A-215B. Seminar in Sedimentation. (2-2) Yr. Mr. TURNER
Prerequisite: Geology 104A-104B.
The following topics will be offered in alternate years: mechanical sediments and sedimentation; deep sea, organic, and chemical sediments and sedimentation.
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
One lecture and two three-hour laboratory periods weekly.
Prerequisite: Chemistry 1A-1B and Physics 1A-1B or 2A-2B. Fee, \$3.
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
Two three-hour laboratory periods weekly.
Prerequisite: Mineralogy 4A. Fee, \$3.
Practice in determination of minerals by physical properties and simple chemical tests.

UPPER DIVISION COURSES

103. Descriptive Mineralogy. (2) II. Mr. PABST
Prerequisite: Mineralogy 4A-4B.
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. (2) 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, beginning 1946-1947.
- *107. Crystallography. (3) I. Mr. PABST
Prerequisite: Mathematics 3A-3B and the 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.
To be given in alternate years, beginning 1947-1948.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

Research. (See Geology 220.)

* Not to be given, 1946-1947.

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.

LAWRENCE M. PRICE, Ph.D., Professor of German.

ARCHER TAYLOR, Ph.D., Professor of German.

CLARENCE PASCHALL, M.A., Professor of German, Emeritus.

*ERWIN G. GUDDE, Ph.D., Associate Professor of German.

EDMUND KURT HELLER, Ph.D., Associate Professor of German.

FRANZ SCHNEIDER, Ph.D., Associate Professor of German.

MADISON S. BEELER, Ph.D., Assistant Professor of German.

C. GRANT LOOMIS, Ph.D., Assistant Professor of German.

ALICE P. TABOR, Ph.D., Assistant Professor of German.

HANS WOLFF, J.D., Ph.D., Assistant Professor of German.

MARIANNE BONWIT, Ph.D., Instructor in German.

O. PAUL STRAUBINGER, Ph.D., Instructor 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 81.

Departmental Major Adviser: Mr. BELL.

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 287. Students looking forward to the secondary credential should include: 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 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
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.
4. Intermediate German. (4) I and II.
Mr. LOOMIS in charge
Prerequisite: course 3, or four years of high school German.

* Absent on leave, 1946-1947.

- 3s-4s. Scientific German. (3-3) Yr. Mr. HELLER in charge
(Formerly numbered 2 π -3 π)
Prerequisite: German 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. Course 4s may be repeated without duplication of credit.
- 3c. German Conversation. (1) I and II. Mr. SCHNEIDER
Open to students who are taking course 3 concurrently.
- 4c. German Conversation. (1) I and II. Mr. SCHNEIDER
Open to students who are taking course 4 concurrently.
- 4m. Medical German. (3) I. Mr. HELLER
(Formerly numbered 3m.)
Prerequisite: course 3 or 3s or equivalent.
- 9A-9B-9C-9D. Great Writers in German Literature. (No knowledge of German required.) (1-1) Yr. The STAFF (Mr. BELL in charge)
*9A. Medieval Period (Bell) II.
*9B. Classical Period, Eighteenth Century (-) II.
9C. Nineteenth Century (Schneider) I.
9D. Twentieth Century (Loomis) II.
Any part of this course is open to students in all departments of the University, major students in German excepted.

UPPER DIVISION COURSES

Prerequisite: sixteen units of lower division courses.

- 100A. Introduction to Modern German Literature. (3) I. Mr. BELL
104. Dramas of the Nineteenth Century. (3) II. Mr. WOLFF
- 108A. Schiller's Life and Works. (3) I. Mr. BREWER
- 109A. Introduction to Goethe. (3) I. Mr. PRICE
Göts von Berlichingen, Urfaust, Werther.
- 110A-110B. The German Ballad and Lyric Poetry. (1-1) Yr. Mr. SCHNEIDER
- *112A. Survey of German Culture and Institutions. (2) I. Mr. GUDDE
Open to all upper division students who have a reading knowledge of German, and recommended for prospective teachers.
114. German Literature of the Nineteenth Century. (3) 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 114.
- 118B. History of German Literature from the Reformation to the Romantic Movement. (3) II. Mr. PRICE
Prerequisite: same as for 114. 118A is not prerequisite.

* Not to be given, 1946-1947.

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. BREWER
- 131A-131B. Advanced Grammar and Composition. (2-2) Yr. Mr. HELLER
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) 118A.
Outlines of grammar. Selections from the *Nibelungenlied* and the epics of chivalry.
140. The Pronunciation of German. (2) II. Mr. BEELER
Designed for prospective teachers and those planning to take philological courses.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The STAFF (Mr. BELL in charge)
Topics selected with the approval of the Department and studied under the direction of one of the instructors.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

Prerequisite: for the literary courses, course 118A or 118B; for those in philology, ordinarily courses 131A-131B, 135, and 140. For advanced study in German literature a reading knowledge of French and a general acquaintance with German history are practically indispensable. For philological work some knowledge of Latin is necessary 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.)
- *202. Medieval Literature. (3) II. Mr. TAYLOR
- *204. Studies in Middle High German Literature. (2) II. Mr. BELL
Prerequisite: course 135.
205. German Literature During the Renaissance and Reformation. (3) II.
Mr. TAYLOR
- *206. German Literature During the Seventeenth Century. (2) II.
Mr. LOOMIS
- *214A. The Precursors of Lessing. (2) I. Mr. PRICE
German literature in the first half of the eighteenth century with special reference to English and French influences.

* Not to be given, 1946-1947.

- *214B. Lessing and His Time. (2) II. Mr. PRICE
214A is not prerequisite to 214B.
218. Herder: A Study of His Ideas on History and Aesthetics. (2) I. Mr. WOLFF
222. Goethe's *Faust*. (3) I. Mr. PRICE
- *225A. Studies in the Novel from Grimmelshausen to Gottfried Keller. (2) I. Mr. GUDDE
- *226. The German Drama in the Nineteenth Century. (2) I. Miss TABOR
- *228A. The Romantic Movement in German Literature, with particular emphasis on the Berlin-Jena Group. (2) I. Mr. BREWER
- 228B. The "Heidelberger Romantik" and the later Berlin Group. (2) II. Mr. BREWER
228A is not prerequisite to 228B.
- *230B. Recent German Drama to the Close of the Expressionistic Movement. (2) II. Mr. BELL
230A is not prerequisite to 230B.
- *242A. Studies in "Das junge Deutschland." (2) I. Mr. SCHNEIDER
Heine and the influences from France.
- 242B. Studies in "Das junge Deutschland." (2) II. Mr. SCHNEIDER
Gutzkow, Wienberg, Laube, Mundt, and others.
242A is not prerequisite to 242B.
- *245. The Tale. (2) II. Mr. TAYLOR
250. Special Study for Graduate Students. (1-4) I and II. The STAFF (Mr. PRICE in charge)

Germanic Philology

For the courses in English Philology see the Department of English, pages 282-286.

- *260. Introduction to Germanic Philology. (3) I. Mr. BEELER
265. Gothic. (3) I. Mr. BEELER
- *270. Old Saxon. (3) I. Mr. HELLER
275. Old High German. (3) II. Mr. HELLER
- *280. Old Norse. (3) II. Mr. BEELER

GREEK

For courses in the Greek language and literature see under Department of Classics, pages 220-224.

* Not to be given, 1946-1947.

HISTORY

- ^a GEORGE H. GUTTRIDGE, M.A. (Cantab.), Professor of English History.
 GEORGE P. HAMMOND, Ph.D., Professor of History.
 JOHN D. HICKS, Ph.D., A. F. and May T. Morrison Professor of History.
 ERNST H. KANTOROWICZ, Ph.D., Professor of History.
 ROBERT J. KERNER, Ph.D., LL.D., Litt.D., Sather Professor of History.
 FRANKLIN C. PALM, Ph.D., Professor of Modern European History.
 FREDERIC L. PAXSON, Ph.D., Litt.D., LL.D., Margaret Byrne Professor of United States History (Chairman of the Department).
 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.
 WOODBRIDGE BINGHAM, Ph.D., Associate Professor of Far Eastern History.
 LAWRENCE A. HARPER, J.D., Ph.D., Associate Professor of American History.
 LAWRENCE KINNAIRD, Ph.D., Associate Professor of History.
 PAUL B. SCHAEFFER, Ph.D., Associate Professor of European History.
 WALTON E. BEAN, Ph.D., Assistant Professor of History.
 JAMES F. KING, Ph.D., Assistant Professor of History.
 ENGEL SLUITER, Ph.D., Assistant Professor of History.
 KENNETH M. STAMPP, Ph.D., Assistant Professor of History.
-
- DELMER M. BROWN, M.A., Lecturer in History.
 GEORGE V. LANTZEFF, Ph.D., Lecturer in History.
 GEORGE M. McCUNE, Ph.D., Lecturer in History.

Introductory Courses.—Courses 4A-4B and 8A-8B are open to all students, but 4A should be taken preferably before 8A by freshmen; courses 17A-17B and 19A-19B are open to all students above the freshman year; the A part of any of the introductory courses should ordinarily precede the B part.

Foreign Language in the Lower Division.—All students who intend to take upper division courses in history are advised to acquire a reading knowledge of at least one of the following languages before they reach their junior year: French, German, Italian, Latin, Spanish.

Letters and Science List.—All undergraduate courses in history are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Advisers: Mr. GUTTRIDGE, Chairman; Mr. BINGHAM, Mr. KING, Mr. SCHAEFFER.

Preparation for the Major.—Required: History 4A-4B; and either 8A-8B or 17A-17B (according to the intention of the student to concentrate in Hispanic-American or United States history); and either Economics 1A or Geography 1.

^a In residence second semester only, 1946-1947.

The Major.—Students majoring in history must complete 24 upper division units in history, including:

- (a) History 101 (required in the junior year).
- (b) A year course of broad scope in each of the two fields, European and Western Hemisphere history.
- (c) Some specialized work in the senior year, to be selected in consultation with the adviser.
- (d) A year's work in the history of the United States, in either the lower or 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 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 History 198 and to page 83.

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

- I. 4A, Sec. 1 (Kerner); Sec. 2 (Palm). 4B (———).
 - II. 4B, Sec. 1 (Kerner); Sec. 2 (Palm). 4A (Schaeffer).
- 4A is prerequisite to 4B for freshmen.

8A-8B. History of the Americas. (3-3) Yr. Beginning each semester.

Mr. KING, Mr. KINNAIRD, Mr. SLUITER

- I. 8A, Sec. 1 (Kinnaird); Sec. 2 (Sluiter). 8B (King).
- II. 8B, Sec. 1 (Kinnaird); Sec. 2 (Sluiter). 8A (King).

17A-17B. History of the United States. (3-3) Yr. Beginning each semester.

Mr. BEAN, Mr. HARPER, Mr. HICKS, ——

Prerequisite: sophomore standing.

- I: 17A, Sec. 1 (Harper); Sec. 2 (Hicks). 17B, Sec. 1 (Bean); Sec. 2 (Stampp).
- II: 17B, Sec. 1 (Harper); Sec. 2 (Hicks). 17A, Sec. 1 (Stampp); Sec. 2 (———).

- 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. SCHAEFFER
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.
- *112. Roman Imperialism. (3) II. Mr. VAN NOSTRAND
113. History of Ancient Mediterranean Colonization. (3) II.
Mr. VAN NOSTRAND
- 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
- *125c. Medieval Thought and Institutions in the Age of Transition (Thirteenth
Century). (3) I. Mr. KANTOROWICZ
- 131A-131B. The Renaissance and the Reformation. (3-3) Yr.
Mr. KANTOROWICZ
- *134A-134B. Western Europe: Its Cultural History since the French Revolu-
tion. (3-3) Yr. Mr. SONTAG
- *141. History of Modern France. (3) I. Mr. PALM
- *142A-142B. History of Modern Italy. (2-2) Yr.
- *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
- *147A-147B. Central Europe and the Near East. (3-3) Yr. Mr. KERNER
- *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.
- 149A-149B. History of Russia and Poland to the Crimean War. (3-3) Yr.
Mr. LANTZEPF

* Not to be given, 1946-1947.

- 150A-150B. History of Russia and Poland Since the Crimean War. (3-3) Yr.
Mr. KERNER
(A) Internal history of Russia and Poland with emphasis on Soviet
Russia.
(B) Russia and the Soviet Union in world politics and world economics.
- 151A. History of England, 1485-1730. (2) II. Mr. GUTTRIDGE
- 151B. History of England, from 1730 to the Present. (3) II. Mr. GUTTRIDGE
May be taken without 151A.
- 152A-152B. Constitutional History of England. (2-2) Yr. Mr. KANTOROWICZ
Prerequisite: course 121A or the permission of the instructor.
- 153A-153B. History of Russian Civilization. (2-2) Yr. Mr. LANTZEFF
- *154. England and the American Colonies to 1783. (2) II. Mr. GUTTRIDGE
- *155. The British Empire Since 1783. (3) Mr. GUTTRIDGE
- 156A-156B. History of Russian Asia, Siberia, and Alaska. (3-3) Yr.
Mr. LANTZEFF
- *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, Mr. SLUITER
I. 161A: The Colonies. (King)
II. 161B: Since Independence. (Sluiter)
- *162A-162B. The Caribbean and Northern South America. (3-3) Yr.
Mr. KING
163. History of Brazil. (3) I. Mr. SLUITER
- 166A-166B. History of Mexico. (2-2) Yr. Mr. HAMMOND
I. 166A: Colonial Period.
II. 166B: National Period.
167. History of the Foreign Relations of the United States. (3) II. Mr. HICKS
- 172A-172B. Constitutional History of the United States. (2-2) Yr.
Mr. HARPER
- 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.
- 173A-173B. Civil War and Reconstruction. (3-3) Yr. Mr. STAMPP
- 174A-174B. Recent History of the United States. (3-3) Yr. Mr. PAXSON
174A. 1890 to 1917; 174B. 1917 to 1945.
- *175. The United States During the First World War, 1914-1921. (2) I.
Mr. PAXSON

* Not to be given, 1946-1947.

- 176A*-176B. Social History of the United States. (3-3) Yr. Mr. HICKS
 176A. The Frontier Period; 176B. The Urban Period.
 NOTE: 176B will be given in the fall semester. 176A will not be given.
177. The Jacksonian Era, 1815-1845. (3) I. Mr. BEAN
- 181A-181B. The History of North America. (3-3) Yr. Mr. KINNAIRD
- *183. Economic Exploitation of Colonial America. (3) I. Mr. SLUITER
187. The Frontier of the United States, 1763-1893. (2) I. Mr. PAXSON
- *189A-189B. History of the Southwest and the Pacific Coast. (2-2) Yr.
 Mr. KINNAIRD
 (A) Spanish and Mexican Period. (B) American Period.
- *190. History of the Pacific Area, 1513-1840. (3) I. Mr. SLUITER
- *191A-191B. History of the Far East. (3-3) Yr. Mr. BINGHAM
- 192A-192B. Far Eastern Diplomatic History. (3-3) Yr. Mr. McCUNE
 The conflict between western imperialism and the social and political institutions of China and Japan; and the effect of this conflict upon present-day developments in the Far East.
- 193A-193B. The Middle Periods of Chinese History, 600-1600. (2-2) Yr.
 Mr. BINGHAM
- *194A-194B. History of Modern China, 1600-1942. (2-2) Yr. Mr. BINGHAM
- 195A-195B. History of Japan. (3-3) Yr. Mr. BROWN
 A survey course; from the beginning to 1946.
- *196A-196B. Rise of Modern Institutions in Japan. (2-2) Yr. Mr. BROWN
 The transition from medieval to modern times, with emphasis on conditions related to the rise of such modern phenomena as banks, large cities, centralized government and nationalism.
- 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. Guttridge, Mr. Schaeffer, Mr. Harper (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 (Mr. PAXSON in charge)
 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, 1946-1947.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

202. Historical Method and Bibliography. (2) I. Mr. VAN NOSTRAND
Designed especially for candidates for higher degrees in history. Stress
is laid on practical exercises.
- 211A-211B. Ancient History. (2-2) Yr. Mr. VAN NOSTRAND
- 221A-221B. Seminar in Medieval History. (2-2) Yr. Mr. SCHAEFFER
Studies in the intellectual history of the twelfth century.
- 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
- *242A-242B. Seminar in Modern European History. (2-2) Yr. ———
- 243A-243B. Seminar in Modern European History. (2-2) Yr. Mr. SONTAG
- 249A-249B. Seminar in Modern European History. (2-2) Yr. Mr. KERNER
- 251B. Seminar in English History. (2) II. Mr. GUTTRIDGE
- 261A-261B. Seminar in Hispanic-American History. (2-2) Yr. Mr. KING
- 271A-271B. History of the United States. (2-2) Yr. Mr. HICKS
- 272A-272B. Seminar in United States History. (2-2) Yr. Mr. HARPER
- 273A-273B. Seminar in United States History. (2-2) Yr. Mr. STAMPP
- 274A-274B. Seminar in United States History. (2-2) Yr. Mr. PAXSON
- 277A. Seminar in United States History. (2) I. Mr. BEAN
- 281A-281B. Seminar in 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 (Mr. PAXSON in charge)

* Not to be given. 1946-1947.

HOME ECONOMICS

AGNES FAY MORGAN, Ph.D., Professor of Home Economics (Chairman of the Department).

RUTH OKEY, Ph.D., Professor of Home Economics.

JESSIE V. COLES, Ph.D., Associate Professor of Home Economics.

HELEN L. GILLUM, Ph.D., Associate Professor of Home Economics.

CATHERINE LANDRETH, Ph.D., Associate Professor of Home Economics.

BESSIE B. COOK, Ph.D., Assistant Professor of Home Economics.

JEAN WARREN, Ph.D., Assistant Professor of Home Economics, Davis.

BARBARA M. KENNEDY, Ph.D., Instructor in Home Economics.

LURA M. MORSE, M.A., Instructor in Home Economics, Davis.

RUBY LORENE DRYDEN, M.A., Associate in Home Economics, Davis.

AGNES C. MCCLELLAND, M.A., Associate in Home Economics.

MAURICE SANDS, Lecturer in Home Furnishing.

Letters and Science List.—Courses 1A-1B, 7, 10, 14, 101A-101B, 102A-102B, 103, 106, 120A-120B, 132, 141, 142, 144, 190 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Curriculum in Home Economics.—The requirements for this curriculum offered in the College of Agriculture are stated on pages 85-92.

Laboratory Fees.—The laboratory fees for courses 1A-1B are \$8 per semester; 101A, 101B, 106, 120A-120B, \$8.50; 102A-102B, \$4; 5, 7, 167, 196, \$2.50.

LOWER DIVISION COURSES

- ✓1A-1B. Experimental Food Study. (3-3) Yr. Miss KENNEDY
Lecture and laboratory. Laboratory fee, \$8 per semester.
Prerequisite: Chemistry 1A, 8. Recommended: Bacteriology 1, A.
Production and composition of food and principles involved in food preparation and preservation.
- ✓5. Elementary Clothing Study. (3) I. Miss MCCLELLAND
Lecture and laboratory. Fee, \$2.50.
Prerequisite: Decorative Art 16A-16B.
Practical and cultural problems in modern garment design and construction.
- ✓7. Introduction to Textiles. (3) II. Miss MCCLELLAND
Lectures and laboratory. Fee, \$2.50.
Prerequisite: Chemistry 1A and 8.
Study of plant, animal, and synthetic fibers used in textiles and of the finished textile material.
- ✓10. Nutrition. (2) I and II. Mrs. COOK
A nontechnical presentation of the modern knowledge of foods and nutrition.
- ✓14. Consumer Problems. (2) II. Miss COLES
A nontechnical discussion of consumers' problems.

UPPER DIVISION COURSES

Food Economics and Technology

- ✓100. Food Economics. (3) I. Miss COLES, ———
Lectures and field or laboratory work. Estimated cost of field trips, \$1.
Prerequisite or concurrent, course 141.
- 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. Laboratory fee, \$8.50.
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. Fee, \$8.50.
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.
- ✓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.

Nutrition

- ✓102A-102B. Food and Dietetics. (3-3) Yr. Miss OKEY
Lectures and laboratory. Fee, \$4 per semester.
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. Laboratory fee, \$8.50.
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.

* Not to be given, 1946-1947.

- 120A-120B. Human Nutrition and Dietetics. (4-5) Yr. Mrs. MORGAN
Lectures and laboratory. For 120B there is an additional laboratory period. Laboratory fee, \$8.50 per semester.
Prerequisite: course 101A and Biochemistry 103, or courses 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. Fee, \$2.50.
Prerequisite or concurrently taken: course 120A-120B.
Problems in the planning and computation of dietaries for normal and pathological conditions.

Institution Economics

110. Institution Food Study. (4) II. Miss GILLUM
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.
111. Institution Organization and Management. (3) I. Miss GILLUM
Lectures and field or laboratory work.
Prerequisite: course 110 or permission of instructor. Recommended: Business Administration 6A, 151 or Psychology 3 or 185.
The principles and problems involved in the organization and management of institution households such as residence halls, hospitals, hotels.
- 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. Given on the San Francisco campus.
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.

* Not to be given, 1946-1947.

Family Economics

- ✓140. Home Management. (3) II. Miss COLES
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 COLES
Prerequisite: Home Economics 140. (This may be taken concurrently.)
Laboratory includes 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 or concurrent: Economics 1A-1B. Not open to students who are taking or have taken Agricultural Economics 101A or Business Administration 123.
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.
- ✓142. Social Problems of Families. (3) II. Miss COLES
Prerequisite: Economics 1A-1B, and either Economics 40 or Psychology 5.
Present-day problems of families as they are related to economic and social conditions.
- ✓144. Family Finance. (3) I. Miss COLES
Prerequisite: Economics 1A-1B, and either Economics 40 or Psychology 5.
Management of personal and family finances—money income, household production, planning expenditures, credit, savings, investments, financing home ownership.

Child Development

132. Child Psychology. (3) I. 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) I and 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 and Family Health. (3) II. Miss LANDRETH
Prerequisite: Physiology 1A.
A consideration of the physical development of children from prenatal through adolescent life and the factors affecting health during this period.
- ✓135. Techniques with Young Children. (3) I and II. Miss LANDRETH
Lectures 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 114.

* Not to be given, 1946-1947.

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.

Textiles and Clothing

- *160. Textiles. (3) I. _____
Lectures and laboratory.
Prerequisite: course 7.
Technical analyses and evaluations of textile fibers and fabrics.
- ✓162. Clothing Economics. (3) I. Miss McCLELLAND
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.
- ✓167. Clothing Design and Construction. (3) II. Miss McCLELLAND
Prerequisite: courses 5 and 7.
Lecture and laboratory. Fee, \$2.50.
Theory and practice of costume design and construction.

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.
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 146.

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. Miss MORSE
5. Elementary Clothing Study. (3) I. Miss DRYDEN

* Not to be given, 1946-1947.

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| 7. Introduction to Textiles. (3) II. | Miss DRYDEN |
| 10. Nutrition. (2) I and II. | Miss MORSE |
| *14. Consumer Problems. (2) I and II. | _____ |

Food Economics and Technology

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| 100. Food Economics. (3) I. | Miss MORSE |
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Nutrition

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| 102A-102B. Food Dietetics. (3-3) Yr. | Miss MORSE |
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Child Development

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| 132. Child Development. (3) I. | _____ |
| 133. Laboratory in Child Development. (1) I. | _____ |
| 134. Child Care and Family Health. (3) II. | _____ |

Family Economics

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| 140. Home Management. (3) II. | Miss WARREN |
| 140L. Home Management Laboratory. (2) II. | _____ |
| 141. Consumers and the Market. (3) I. | Miss WARREN |
| 142. Social Problems of Families. (3) I. | Miss WARREN |
| *144. Family Finance. (3) II. | Miss WARREN |
| 150. The House. (2) II. | _____ |

Textiles and Clothing

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| *162. Clothing Economics. (3) I. | Miss DRYDEN |
| 167. Clothing Design and Construction. (3) II. | Miss DRYDEN |

DECORATIVE ART

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|--|-------|
| 16A-16B. Theory of Design and Color. (2-2) Yr. | _____ |
| 130A. Interior Design. (2) I. | _____ |
| *190. Home Furnishing. (2) II. | _____ |

* Not to be given, 1946-1947.

ITALIAN

RUDOLPH ALTROCCHI, Ph.D., Professor of Italian (Chairman of the Department).

HERBERT H. VAUGHAN, Ph.D., Professor of Italian.

MICHELE DE FILIPPIS, Ph.D., Associate Professor of Italian.

Letters and Science List.—All undergraduate courses in Italian are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

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.—Twenty-four units of upper division courses of which at least 18 must be in Italian. Six 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. DE FILIPPIS
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. VAUGHAN
- 101A-101B. Advanced Grammar, Composition, and Conversation. (3-3) Yr.
Mr. VAUGHAN
- 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.

* Not to be given, 1946-1947.

- *104A-104B. Italian Literature of the Nineteenth Century. (3-3) Yr.
Mr. ALTROCCHI
Reading of texts, with a special study of literary technique. Lectures in Italian.
- 109A-109B. Dante's *Divina Commedia*. (3-3) Yr. Mr. ALTROCCHI
Prerequisite: 6 units of upper division work in Italian or the equivalent.
- 150A-150B. Dante's *Divine Comedy* in English Translation. (2-2) Yr.
Mr. ALTROCCHI
Designed for upper division students wishing the cultural background provided by such a masterpiece as Dante's, and for graduate students whose major field is not in Romance languages. Enrollment limited to students who have already completed some upper division work or who present other evidence of adequate preparation. No knowledge of Italian required. Will not be accepted toward the major in Italian. 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. (1-2) I and II.
Mr. ALTROCCHI, Mr. VAUGHAN, Mr. DE FILIPPIS
Reading course with a short thesis.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

- †201A-201B. Italian Philology and Dialects. (2-2) Yr. Mr. VAUGHAN
- 206A-206B. Problems in Italian Grammar. (2-2) Yr. Mr. VAUGHAN
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. VAUGHAN, Mr. DE FILIPPIS

* Not to be given, 1946-1947.

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

JOURNALISM

ROBERT W. DESMOND, Ph.D., Professor of Journalism (Chairman of the Department).

PHILIP F. GRIFFIN, M.A., Assistant Professor of Journalism.

JOHN V. LUND, A.B., Assistant Professor of Journalism.

NEAL O. HINES, M.S.J., Instructor in Journalism.

*WILLIAM MARTIN CAMP, LL.B., Lecturer in Journalism.

CLAIRE MAX HAMILTON, M.A., Associate in Journalism.

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 81.

Departmental Major Advisers: Mr. Desmond, Chairman, Mr. Griffin, Mr. Lund.

Preparation for the Major.—Required: History 4A–4B, Political Science 1, 2, Economics 1A–1B, English 1A–1B or Public Speaking 1A–1B, Journalism 20A–20B. Recommended: Philosophy 6A–6B or 10A–10B, 12; English 30, 41A–41B, 44A–44B, 46A–46B, Social Institutions 1A–1B, Psychology 1A–2, Geography 1–2, Business Administration 18.

The Major—The major consists of 35 or 36 units of upper division work in journalism, English, and social sciences, taken in accordance with a plan approved by the major adviser.

Required: a year course (6 units) of upper division history (United States, European, or Hispanic-American); either Political Science 113 or 151 (3 units); 6 units of upper division economics; 2 or 3 units selected from the following courses: English 114A–114B, 116, 117A–117B, 117E, 123, 125C–125D, 130A, 130B, 130C, 153A–153B; Journalism 130A–130B, 140, 141 (12 units); and 6 units selected from the following courses: Journalism 150, 170A–170B, 190, 198, 199, Business Administration 123, 125.

Admission to the major is contingent upon the student achieving at least a B grade in Journalism 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. Students who do not maintain such a record may be required to withdraw from the major at any time.

LOWER DIVISION COURSE

20A–20B. News Writing and Reporting. (3–3) Yr. Mr. GRIFFIN, Mr. HINES

Two lectures a week and one two-hour laboratory section.

Prerequisite: English 1A–1B or Public Speaking 1A–1B and sophomore standing, or permission of instructor. 20A is prerequisite to 20B.

UPPER DIVISION COURSES

130A–130B. News Editing. (3–3) Yr. Mr. LUND, Mr. HINES

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 Saturday preceding beginning of instruction. 130A is prerequisite to 130B.

* Absent on leave until February 1, 1947.

140. History of Journalism. (3) I. Mr. DESMOND
Open to all upper division students, without prerequisite.
141. The Press and Society. (3) II. Mr. DESMOND
Open to all upper division students, without prerequisite.
150. Contemporary Editorial Problems. (3) II. Mr. DESMOND
Prerequisite: courses 20A-20B, 130A-130B, or permission of instructor.
- 170A-170B. Principles of Publishing. (3-3) Yr. Mr. LUND, Mr. HINES
Two lectures a week and one two-hour laboratory section.
Prerequisite: courses 20A-20B, 130A-130B, or permission of instructor.
170A is not prerequisite to 170B.
170A. Analysis of the economy, organization and operation of daily and weekly newspapers.
170B. 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.
Open only to seniors. The STAFF (Mr. DESMOND in charge)
199. Special Study for Advanced Students. (1-4) I and II.
The STAFF (Mr. DESMOND 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 permission of instructor; for others, at least a B average in all courses undertaken, and permission of instructor.

JURISPRUDENCE

BARBARA NACHTRIEB ARMSTRONG, J.D., Ph.D., Professor of Law.

HENRY W. BALLANTINE, A.B., LL.B., LL.D., Professor of Law.

EDWIN D. DICKINSON, Ph.D., J.D., Emanuel S. Heller Professor of Law
(Chairman of the Department).

WILLIAM WARREN FERRIER, JR., A.B., J.D., Professor of Law.

HARRY WILLMER JONES, A.B., LL.B., LL.M., 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.

DUDLEY O. MCGOVNEY, M.A., LL.B., Professor of Law.

JOHN C. PEPPIN, A.B., J.D., Professor of Law.

* MAX RADIN, LL.B., Ph.D., John H. Boalt Professor of Law.

TALBOT SMITH, J.D., Professor of Law.

EDWARD L. BARRETT, JR., B.S., LL.B., Lecturer in Law.

FRANK C. NEWMAN, A.B., LL.B., 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, including special provisions for veteran applicants, 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.

Fees.—In the School of Jurisprudence an incidental fee of \$60 a semester is payable at the time of registration by every student, graduate or undergraduate, regular or special, registering in more than one professional law course. This fee includes the incidental fee of \$27.50 payable by all students registering in the departments of the University at Berkeley.

Nonresidents of California enrolled as students in the School of Jurisprudence pay a fee of \$210 each semester, which includes the incidental fee charged to all students.†

PROFESSIONAL CURRICULUM

First Year

200A-200B. Civil Procedure: First Course. (2-3) Yr.	Mr. MCBAIN
202A-202B. Contracts. (3-3) Yr.	Mr. TALBOT SMITH
204. Corporations: First Course. (2) II.	Mr. TALBOT SMITH
206. Criminal Law and Procedure. (3) I.	Mr. KIDD

* In residence second semester only, 1946-1947.

† Nonresident students who were in attendance throughout the Spring Term of 1944 will pay a fee of \$122.50, including the incidental fee, each semester, as long as they continue in attendance upon subsequent semesters without interruption.

208. Equity: First Course. (2) II.	Mr. JONES
209. Legal Bibliography. (1) II.	Mr. V. M. SMITH
210. Legal Method. (2) I.	Mr. JONES
212. Property: First Course. (3) I.	Mr. FERRIER
214. Property: Second Course. (2) II.	Mr. FERRIER
216A-216B. Torts. (2-2) Yr.	Mr. BALLANTINE

218. Directed Reading. I and II. Mr. FERRIER and the STAFF

Open only to returning veterans who have previously completed part of the work of the first year and who desire supervised reading as a refresher before resuming the regular program. Credit not to exceed 2 units may be allowed in appropriate circumstances upon satisfactory completion of the course prescribed.

Second Year

220A-220B. Civil Procedure: Second Course. (2-2) Yr.	Mr. BARRETT
222A-222B. Commercial Paper and Security. (2-3) Yr.	Mr. KIDD
224A-224B. Constitutional Law. (2-2) Yr.	Mr. MCGOVNEY
226A-226B. Corporations: Second Course. (2-2) Yr.	Mr. BALLANTINE
228A-228B. Equity: Second Course. (2-2) Yr.	Mr. NEWMAN
230. Marital Property. (2) II.	Mrs. ARMSTRONG
232. Property: Third Course. (3) I.	Mr. FERRIER
234. Writing and Research Practice. (No credit) I and II.	Mr. V. M. SMITH and the STAFF

236. Directed Reading. I and II.

Mr. KIDD and the STAFF

Open only to returning veterans who have previously completed the work of the first year and part of the work of the second year and who desire supervised reading as a refresher before resuming the regular program. Credit not to exceed 2 units may be allowed in appropriate circumstances upon satisfactory completion of the course prescribed.

Third-Year Electives

240. Administrative Law. (3) I.	Mr. MCGOVNEY
242. Admiralty. (2) I.	Mr. DICKINSON
243. Banking and Negotiable Instruments. (3) I.	Mr. NEWMAN
244A-244B. Civil Procedure: Third Course. (2-2) Yr.	Mr. MCBAIN
245. Comparative Law. (2) II.	Mr. RADIN
246. Conflict of Laws. (3) II.	Mr. DICKINSON

*247. Corporations: Third Course. (2) II.	Mr. BALLANTINE
248. Creditors' Rights. (3) II.	Mr. RADIN
252. Equity: Third Course. (2) I.	Mr. TALBOT SMITH
253. Family Law. (2) I.	Mrs. ARMSTRONG
254. Federal Jurisdiction. (2) II.	Mr. JONES
256. Government Regulation: First Course. (2) I.	Mr. JONES
258. Government Regulation: Second Course. (2) II.	Mr. NEWMAN
262. Industrial Law: First Course. (2) I.	Mrs. ARMSTRONG
264. Industrial Law: Second Course. (2) II.	Mrs. ARMSTRONG
*266. International Law. (2) I.	Mr. DICKINSON
*270. Legal Aid. (2) I and II.	Mr. V. M. SMITH
276. Municipal Corporations. (2) I.	Mr. PEPPIN
278. Persons: Second Course. (2) II.	Mrs. ARMSTRONG
280. Property: Fourth Course. (2) II.	Mr. FERRIER
282. Security: Second Course. (2) II.	Mr. KIDD
284. Taxation: First Course. (2) I.	Mr. PEPPIN
285. Taxation: Second Course. (3) II.	Mr. PEPPIN
286. Taxation: Third Course. (2) II.	Mr. PEPPIN

Graduate Curriculum

NOTE.—The specific courses given in any year will depend upon the needs of the students.

287A-287B. Seminar in Administrative Law and Regulation. (2-2) Yr.	Mr. JONES and Mr. NEWMAN
288A-288B. Seminar in Business Organizations. (2-2) Yr.	Mr. BALLANTINE and Mr. TALBOT SMITH
289A-289B. Seminar in Commercial Transactions. (2-2) Yr.	Mr. KIDD and Mr. TALBOT SMITH
290A-290B. Seminar in Constitutional Law. (2-2) Yr.	Mr. BARRETT and Mr. MCGOVNEY
291A-291B. Seminar in Criminal Law and Procedure. (2-2) Yr.	Mr. KIDD
292A-292B. Seminar in Industrial Law. (2-2) Yr.	Mrs. ARMSTRONG
293A-293B. Seminar in International and Maritime Law. (2-2) Yr.	Mr. DICKINSON

* Not to be given, 1946-1947.

- 294A*-294B. Seminar in Legal History and Jurisprudence. (2-2) Yr.
Mr. RADIN
- 295A-295B. Seminar in Legislation. (2-2) Yr.
Mr. JONES and Mr. V. M. SMITH
- 296A-296B. Seminar in Procedure and Practice. (2-2) Yr.
Mr. MCBAIN and Mr. PEPPIN
- 297A-297B. Seminar in Property and Trust Administration. (2-2) Yr.
Mr. FERRIER and Mr. NEWMAN
- 298A-298B. Seminar in Public Finance and Taxation. (2-2) Yr.
Mr. BARRETT and Mr. PEPPIN
- 299A*-299B. Seminar in Roman and Comparative Law. (2-2) Yr. Mr. RADIN
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LATIN

For courses in the Latin language and literature, see under Department of Classics, pages 220-224.

* Not to be given, 1946-1947.

LIBRARIANSHIP

DONALD CONEY, M.A., Professor of Librarianship.

EDITH M. COULTER, M.A., B.L.S., Professor of Librarianship.

CARLETON B. JOECKEL, Ph.D., Professor of Librarianship.

J. PERIAM DANTON, Ph.D., Associate Professor of Librarianship (Chairman of the Department).

SYDNEY B. MITCHELL, M.A., Professor of Librarianship, Emeritus.

DELLA J. SISLER, M.A., B.L.S., Associate Professor of Librarianship, Emeritus.

² JESSIE E. BOYD, M.A., Lecturer in School Library Administration and Supervisor of School Library Practice (spring semester).

² LEONE GARVEY, M.A., Lecturer in Librarianship (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, a certificate is issued. The degree of Master of Arts 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.)

First-Year Curriculum

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 or to take any courses other than those in the School.

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. A college year each of two modern languages is required for admission. This will be interpreted as not less than 6 semester units of each. German and French are particularly recommended for those planning for university library positions. Ability to use the typewriter with accuracy and a fair degree of speed is expected of all students. Experience in library work is highly desirable but is not required for admission.

² In residence spring semester only, 1946-1947.

Applications from those who obtain less than 1.5 grade points per unit in their last two years of college or university work cannot be considered.

Applications from those over 35 years of age will be considered only when the applicants hold responsible library positions from which they can obtain leaves of absence.

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 secondary 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 1946-1947, 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 to be elected from any courses in the first-year curriculum and one course may be elected 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 average in the first semester will not be permitted to enroll in the second semester.

201. Classification and Cataloguing. (3) I.	_____
Lectures and laboratory.	
202. Bibliography and Reference Materials. (3) I.	Miss COULTER
203. Administration of Libraries. (3) I.	Mr. JOECKEL
204. Book Selection. (3) I.	_____
205. Book Buying. (2) II.	_____
206. School Library Administration. (2) II.	Miss BOYD
207. Municipal and County Library Administration. (2) II.	Mr. JOECKEL
208. University and College Library Administration. (2) II.	Mr. DANTON
209. Library Work with Children. (2) II.	Miss GARVEY
210. Special Libraries. (2) II.	Miss COULTER
211. Book Arts. (2) II.	_____
212. Government Publications. (2) II.	Miss COULTER

213. Bibliographical Cataloguing. (2) II. _____
Lectures and laboratory.
214. Reference Materials for Larger Libraries. (2) II. Miss COULTER
215. Book Selection for Public Libraries. (2) II. _____

Second-Year Curriculum

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 and the remaining 12 units 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 students. 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. _____
Prerequisite: courses 201 and 213 or equivalents.
- 220A-220B. Bibliography. (2-2) Yr. Miss COULTER
Prerequisite: courses 202 and 214 or equivalents.
221. Book Collecting for University Libraries. (2) I. Mr. DANTON
225. History of Libraries. (2) II. Miss COULTER
Subject 1946-1947: Modern libraries and special collections of Europe and America.
226. History of Printing. (2) I. _____
Subject 1946-1947: Fifteenth and Sixteenth centuries.
232. University Library Administration. (2) I. Mr. CONEY
233. School Library Administration. (2) I. Miss COULTER
Subject: Junior college libraries.
234. Public Library Administration. (2) II. Mr. JOECKEL
- †251. Librarianship as a Field of Research. (2). _____
299. Special Study. (2-4) I and II. The STAFF (Mr. JOECKEL in charge)
Second-year students may elect special studies in any semester.

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

MATHEMATICS

- *BENJAMIN A. BERNSTEIN, Ph.D., Professor of Mathematics.
 THOMAS BUCK, Ph.D., Professor of Mathematics.
 GRIFFITH C. EVANS, Ph.D., Professor of Mathematics (Chairman of the Department).
 HANS LEWY, Ph.D., Professor of Mathematics.
 CHARLES B. MORREY, JR., Ph.D., Professor of Mathematics.
- ²JERZY NEYMAN, Ph.D., Professor of Mathematics and Director of the Statistical Laboratory.
 ALFRED TARSKI, Ph.D., Professor of Mathematics.
 MELLEN W. HASKELL, Ph.D., Professor of Mathematics, Emeritus.
 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.
 BING C. WONG, Ph.D., Associate Professor of Mathematics, Emeritus.
 ALFRED L. FOSTER, Ph.D., Associate Professor of Mathematics.
 DERRICK H. LEHMER, Ph.D., Associate Professor of Mathematics.
 SOPHIA LEVY McDONALD, Ph.D., Associate Professor of Mathematics.
 ANTHONY P. MORSE, Ph.D., Associate Professor of Mathematics.
- *RAPHAEL M. ROBINSON, Ph.D., Associate Professor of Mathematics.
 PAULINE SPERRY, Ph.D., Associate Professor of Mathematics.
- ²ELMER C. GOLDSWORTHY, Ph.D., Assistant Professor of Mathematics.
 RAYMOND H. SCIOBERETI, Ph.D., Assistant Professor of Mathematics.
 LEE H. SWINFORD, Ph.D., Assistant Professor of Mathematics.
 ARTHUR R. WILLIAMS, Ph.D., Assistant Professor of Mathematics.
 FRANTISEK WOLF, Ph.D., Assistant Professor of Mathematics.
 CHARLES A. HAYES, Ph.D., Instructor in Mathematics.
 ALFRED HORN, Ph.D., Instructor in Mathematics.
 ERICH L. LEHMANN, Ph.D., Instructor in Mathematics.
 EDMUND PINNEY, Ph.D., Instructor in Mathematics.
 ABRAHAM SEIDENBERG, Ph.D., Instructor in Mathematics.
-
- MARK W. EUDEY, A.B., Lecturer in Mathematics.
 EVELYN FIX, M.A., Lecturer in Mathematics.

Letters and Science List.—All undergraduate courses in mathematics except course 107 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Adviser: Miss SPERRY.

Preparation for the Major. Adviser: Mr. FOSTER.

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

* Absent on leave, 1946-1947.

² In residence spring semester only, 1946-1947.

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 Major.—In his 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.

Subject to this requirement of competence, 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. Course 201 forms a desirable part of the program for senior students with facility for mathematics, as well as the courses listed in the upper division. Special attention is directed to course 199.

The students' attention is also 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.

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.

Statistics.—Students who plan to pursue graduate work in the theory of statistics should consult with Mr. Neyman as early as the beginning of the junior year.

LOWER DIVISION COURSES

- C. Trigonometry. (3) I and II. The STAFF and Assistants
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. The STAFF and Assistants
(Formerly numbered E.)
- D. Intermediate Algebra. (3) I and II. The STAFF and Assistants
(Formerly numbered 1.)
Prerequisite: one year of high school algebra. One and one-half years of high school algebra is advised. Not open to students who have received credit for two years of high school algebra, or course 3A or 8.
1. College Algebra. (3) I and II. The STAFF and Assistants
(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 and who fail in the qualifying examination in that course.

2. Mathematics of Finance and Business. (3) I and II. 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. Plane Analytic Geometry. (3) I and II. The STAFF and Assistants
 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 test in elementary algebra will be given at the end of two weeks of the course. Students who fail this test will be required to pass course 1 before taking course 3A.
 Includes conic sections, general equations of the second degree.
- 3B. First Course in Calculus. (3) I and II. The STAFF and Assistants
 Prerequisite: course 3A or course 11A–11B.
 Differential calculus with applications to geometry and mechanics.
3. Plane Analytic Geometry and First Course in Calculus. (6) I and II.
 Prerequisite: same as for 3A. The STAFF and Assistants
- 4A. Second Course in Calculus. (3) I and II. The STAFF
 Prerequisite: course 3A–3B.
 Continues the development and application of the calculus; includes integration, infinite series.
- 4B. Third Course in Calculus. (3) I and II. The STAFF
 Prerequisite: course 4A.
 Continuation of the calculus, including quadratic surfaces, partial derivatives, and multiple integrals, with applications to geometry and mechanics.
4. Second and Third Courses in Calculus. (6) II. The STAFF
 Prerequisite: same as for 4A.
8. Theory of Algebraic Equations. (3) I and II. Mr. LEWY
 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. Mr. WILLIAMS
 (Formerly numbered 6.)
 Prerequisite: course G or high school solid geometry, and course 8 or its equivalent.
 Projective theory of one dimensional forms, point and line conics. Mainly by the synthetic method.
10. Spherical Trigonometry. (2) I and II. Mr. SCIOBERETTI
 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. WILLIAMS
 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.

12A-12B. Introduction to Probability and Statistics (see under *Statistics*).

14A-14B. Calculus and Advanced Calculus. (5-5) Yr. The STAFF

During the emergency period, 14A and 14B are respectively consolidations of 4A, 110A and 4B, 110B. Both A and B parts will be given each semester.

UPPER DIVISION COURSES

101A-101B. Elementary Mathematics for Advanced Students. (3-3) Yr.

I: (Tarski). II: (McDonald). Mr. TARSKI, Mrs. McDONALD

Prerequisite: courses 4A-4B, 8, 9 (formerly 6). (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; coördination; 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.

110A-110B. Advanced Engineering Mathematics. (2-2) Yr. The STAFF

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) II.

Mr. TARSKI

Prerequisite: courses 4A-4B, 8.

Linear dependence, matrices, invariants, quadratic forms.

111B. Algebra. (3) I.

Mr. FOSTER

Prerequisite: courses 4A-4B, 8. 111B may precede 111A if this order is unavoidable.

Groups, theory of equations, introduction to Galois theory.

112A. Introduction to Higher Geometry. (3) II.

Mr. WILLIAMS

Prerequisite: courses 4A-4B, 9 (formerly 6), 111A.

Projective coördinates. Loci of the second order. Higher plane curves.

112B. Introduction to Metric Differential Geometry. (3) I.

Miss SPERRY

Prerequisite: course 4A-4B. 112A is not prerequisite to 112B.

Introduction to algebra of vectors. Study of curves and surfaces in spaces of three dimensions.

115A-115B. Introduction to the Theory of Numbers. (3-3) Yr. Mr. LEHMER

Prerequisite: course 8; 115A is not prerequisite to 115B.

Divisibility, congruences, number systems.

116. Exterior Ballistics. (3) II.

Mr. SWINFORD

Prerequisite: course 4A-4B.

The classical theory of the motion of a particle subject to the forces of gravity and the resistance of the air, together with some recent developments.

- 119A-119B. Differential Equations. (3-3) Yr.
 Mr. MORSE, Mr. SCIOBERETTI, Miss SPERRY,
 Mr. LEHMER, Mr. SWINFORD, Mr. WOLF
 Prerequisite: 4A-4B, with honor grades; or 14A-14B; or 4A-4B and
 110A-110B; or permission 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. Elementary Theory of Probability. (See under Statistics.)
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. FOSTER
 127A is not prerequisite to 127B.
 Mathematical development of logic, and the logic of algebra and geom-
 etry.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Miss SPERRY 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 146.

- 201A-201B. Function Theory. (3-3) Yr. Mr. MORREY
 Prerequisite: course 119A-119B.
 Introduction to real and complex variable.
 Students with facility for mathematics may well take this course in the
 senior, undergraduate year.
- 205A-205B.† Theory of Functions of a Complex Variable. (3-3) Yr.
 Prerequisite course 201A-201B. Mr. LEWY, Mr. WOLF
- 210A-210B. Theory of Functions of a Real Variable. (3-3) Yr. Mr. MORSE
 Prerequisite: course 201A-201B.
- 220A-220B. Differential Equations. (3-3) Yr. Mr. BUCK
 This course presupposes some knowledge of complex and real variable
 theory.

* Not to be given, 1946-1947.

† 205B will be given in the fall semester if a sufficient number of students enroll.

- 240A-240B. Differential Geometry. (3-3) Yr. Miss SPERRY
 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.
- ‡230A-230B. Algebraic Geometry. (3-3) Yr. Mr. SEIDENBERG, Mr. WILLIAMS
 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.
- 250A-250B. Algebra. (3-3) Yr. Mr. TARSKI, Mr. FOSTER
 Invariants, groups, Galois theory, fields, modern algebraic theory.
270. Technical Hydrodynamics. (3) II. Mr. LEWY
 Theoretical analyses of motion of frictionless and viscous fluids, flow of compressible fluids at sub- and super-sonic velocities.
290. Seminars. (2-6) I and II. The STAFF (Mr. EVANS in charge)
 Topics in foundations of mathematics, theory of numbers, numerical calculation, analysis, geometry, algebra, probability and theory of statistics, and in their applications, by means of lectures, and informal conferences with members of the staff; work based largely on original memoirs. During 1946-1947 there will be, in particular, lecture seminars on the following subjects, in charge of the persons indicated:
 (a) Foundations of mathematics, I, II, Foster; (b) Potential theory, I, II, Evans; (c) Topics in analyses, I, II, Swinford, Wolf; (d) Theory of vibrations, I, Mr. Pinney; (e) Topics in algebra and metamathematics I, II, Tarski.
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

- 12A-12B. Introduction to Probability and Statistics. (3-3) Yr.
 Prerequisite: course 3A. Mr. LEHMANN
 Introductory theory, with applications to genetics, bacteriology, industrial sampling, and public health service.
 Beginning in 1947-1948, course 12A-12B will be prerequisite to course 120A (see under Statistics) except for those students who receive grades of A or B in course 4A-4B.

UPPER DIVISION COURSES

- 120A-120B. Elementary Theory of Probability. (3-3) Yr. Miss FIX
 Prerequisite: course 4A-4B.
 Definitions and fundamental theorems. Empirical law of large numbers and possibility of applications. Illustrations from Mendelian theory of heredity. Mathematical law of large numbers and theorems of Laplace and Bienaymé-Tshebysheff. Theory of least squares. Applications.

‡ In 1946-1947, 230B will be given in the fall semester, 230A in the spring.

132. Descriptive Statistics. (4) II. Mr. EUDEY
 (Formerly numbered 122.)
 Prerequisite: courses 4A-4B, 120A.
 Lectures and laboratory.
 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.

GRADUATE COURSES

NOTE.—Courses 261, 264, and 266 are intended to introduce the student to practical work in various fields of application. Apart from four hours of supervised practical work, connected with courses 261-266 the students attending these courses will be able to use the laboratory at other times.

Students who are doing research problems in experimental sciences may register in courses 261-266 without the specified prerequisite, with the permission of the instructor.

The laboratory will be open to graduate students for research.

- 260A. Probability, Second Course. (5) I. Mr. LEHMANN
 Prerequisite: courses 120A-120B, 201A-201B.
 Three lectures and six laboratory hours weekly.
 Probability laws and their transformations. Early principles of statistical tests. Lambda criterion and linear hypotheses. Applications to the analysis of variance. General theory of testing hypotheses. Uniformly most powerful tests. Unbiased tests.
- 260B. Theory of Testing Composite Statistical Hypotheses. (3) II. Mr. LEHMANN
 Prerequisite: course 260A.
 Regions similar to the sample space. Connection with the problem of moments. Bi-similar regions. Connection with theory of orthogonal expansions. Sufficient systems of statistics. Uniformly most powerful tests of composite hypotheses. Unbiased tests.
261. Statistical Problems in Experimentation. (3) I. Mr. EUDEY
 Prerequisite: course 120A-120B.
 Statistical hypotheses and their tests. Power function as a basis for 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) I. Mr. EUDEY
 Lectures and laboratory.
 Prerequisite: course 120A-120B.
 Life and sickness tables. Standard error of a table. Law of Gompertz-Makeham. Standardization of rates of risks. Epidemiological and medical statistics. Theory of growth. Simple random processes explaining various population phenomena. Problems of social and commercial insurance.

* Not to be given, 1946-1947.

264. Statistical Problems of Mass Production and Control of Quality. (3) II.

Lectures and laboratory work on Wednesday and Friday evenings, hours to be arranged.

Prerequisite: for mathematical students, course 120A-120B; students specializing in subjects other than mathematics and engineers working in industry are expected to be familiar with college algebra and calculus.

Variability in manufactured products. Conception of controlled accuracy of analyses and of controlled variability of manufactured products. Sampling designed to protect interests of manufacturer and of consumer. Estimation of percentage of defective. Causes of defects. Design of experiments and probability of success.

265A-265B. Advanced Probability. (3-3) Yr. Mr. LEWY

Prerequisite: courses 120A-120B, 201A-201B; course 260 is not a prerequisite, but students familiar with its contents are likely to appreciate more the various points discussed in 265A-265B.

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) I. Mr. LEHMANN

Prerequisite: Economics 40, or Mathematics 120A-120B, or permission of the instructor.

Mathematical theory of sampling. Best linear unbiased estimate and their variances. Sampling methods: Unrestrictedly random, stratified and double sampling method of Friedman-Wilcox.

267. Advanced Theory of the χ^2 Test. (3) II. Mr. NEYMAN

Prerequisite: course 260A.

Generalized theorem of Laplace. Tests equivalent in the limit. Various aspects of the χ^2 Test. Best asymptotically normal estimates.

268. Theory of Statistical Estimation. (3) II. Mr. NEYMAN

Prerequisite: course 260A.

Single estimates and estimation by intervals. Application of Bayes' Theorem. Confidence intervals. Idea of Statistical Inference of A. Wald.

290s. Statistical Seminar. (2-6) I and II. ———, Mr. NEYMAN

295. See page 338.

MEDICO-MILITARY SCIENCE AND TACTICS

A division of the Medical School

ALVIN J. BAYLEY, Colonel, Medical Corps, Commandant SCU 1904 and Professor of Medico-Military Science and Tactics.

Letters and Science List.—Course 121A-121B is included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

The work of this division consists of a four-year progressive course divided into periods of two years each: a Basic Course for first- and second-year students and an Advanced Course for those of the third and fourth years. The courses are elective for students in the Medical School.*

121A-121B. Basic Medico-Military Science and Tactics (first year). (1-1) Yr.
Lectures and demonstrations. Mr. BAYLEY
For courses 122A-122B, 123A-123B, and 124A-124B, see the Announcement of the Medical School.

* Advanced course expected to be authorized by the War Department for the year 1946-1947.

MILITARY SCIENCE AND TACTICS

WILLIAM L. RITTER, Colonel, Infantry; Professor of Military Science and Tactics (Chairman of the Department).

MATTHEW C. MAUTZ, Lieutenant-Colonel, Signal Corps; Associate Professor of Military Science and Tactics.

CARL B. BARNES, Major, Infantry; Associate Professor of Military Science and Tactics.

NEIL E. SALING, Major, Infantry; Associate Professor of Military Science and Tactics.

CHARLES A. DOW, JR., Captain, Ordnance Department; Assistant Professor of Military Science and Tactics.

FERDINAND H. FLICK, Captain, Coast Artillery Corps; Assistant Professor of Military Science and Tactics.

DAVID T. BUTTS, JR., First Lieutenant, Infantry; Instructor in Military Science and Tactics at Davis.

The courses in Military Science and Tactics to be given in 1946-1947 will be announced at the time of registration.

MUSIC

- ¹ MANFRED F. BUKOFZER, Ph.D., Professor of Music.
² ALBERT I. ELKUS, M.L., Professor of Music (Chairman of the Department, spring semester).
² ERNEST BLOCH, Professor of Music (Summer Sessions only).
 ROGER SESSIONS, A.B., Mus.B., Professor of Music.
¹ EDWARD G. STRICKLEN, Professor of Music.
 CHARLES C. CUSHING, M.A., Associate Professor of Music (Chairman of the Department, fall semester).
 † EDWARD B. LAWTON, JR., A.B., Associate Professor of Music.
 DAVID D. BOYDEN, M.A., Assistant Professor of Music.
 WILLIAM D. DENNY, M.A., Assistant Professor of Music.
 WINIFRED B. HOWE, M.A., Instructor in Music.

PETER F. ABRAHAM, Lecturer in Music.
 MADI BACON, M.A., Lecturer in Music.
 MARJORIE GEAR PETRAY, A.B., Lecturer in Music.
 LEONARD G. RATNER, M.A., Lecturer in Music.
 FRANKLIN CARTER, Associate in Music.
 WILLIAM E. KNUTH, M.A., Ed.D., Associate in Music.
 ERNEST KUBITSCHKEK, Associate in Music.
 HERMAN C. TRUTNER, III, Associate 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 15, 25, 125, and 155, will be accepted as Letters and Science credit. For regulations governing this list, see page 81.

Departmental Major Advisers: Mr. BOYDEN, 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 at the beginning of the freshman year, in order to insure the fulfillment of the departmental prerequisites for the lower division. Specialization presupposes some ability in piano playing.

Undergraduate students transferring from other colleges should consult with the 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, 105A, 105B, 107A, 107B, 108.

¹ In residence fall semester only, 1946-1947; ² in residence spring semester only, 1947; † on sabbatical leave of absence in residence, 1946-1947.

II. History and Literature: At least two of the following courses: 116, 117, 118, 119, 120.

III. Performance: At least two of the following courses: 125, 135, 155, 165, 175.

IV. 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, public speaking, 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.—Advisers: Mr. BOYDEN, 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 328, 329A, 329B, and 329C; teacher-training students are urged to undertake this work before attaining graduate status.

Higher Degrees.—Advisers: Mr. BUKOFZER, Mr. SESSIONS; see also the ANNOUNCEMENT OF THE GRADUATE DIVISION and the special announcements issued by the department concerning the M.A. and Ph.D. degrees.

Fees.—In courses 445B, 445D, 455A, 455C, 475A, 475D there is a fee of \$5.

LOWER DIVISION COURSES

Theory

- | | |
|--|-----------------------|
| A. Musicianship. (2) I.
Elements of music, with ear training and sight singing. | Miss HOWE |
| B. Musicianship. (2) II.
A continuation of course A, which is prerequisite. | Miss HOWE |
| C. Musicianship. (2) I.
A continuation of course B, which is prerequisite. | Mr. DENNY |
| 1. Elementary Counterpoint. (3) I.
Mr. ABRAHAM, Mr. BUKOFZER, Miss HOWE, Mr. RATNER
Prerequisite: course A, completed or taken concurrently.
Sixteenth-century polyphony: theory and practice. Preparatory exercises and motet writing. | |
| 2. Elementary Harmony. (3) II.
Mr. CUSHING, Mr. DENNY, Miss HOWE,
Mr. RATNER, Mr. SESSIONS
Prerequisites: course 1; course B, completed or taken concurrently. | |
| 4A-4B. Intermediate Harmony. (3-3) Yr.
Prerequisite: course 2. | Mr. BOYDEN, Miss HOWE |

History and Literature

- 27A-27B. Introduction to Musical Literature. (3-3) Yr. Mr. SESSIONS, Mr. ELKUS
 27A (Sessions), 27B (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, completed or taken concurrently, or the consent of the instructor.
 A study of the development of music from antiquity to the present; lectures, listening, technical analysis, and written reports.

Performance

15. 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.
 Course 15 may be repeated once without duplication of credit.
 NOTE.—See course 155.
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. Course 25 may be repeated once without duplication of credit.
 NOTE.—See course 125.
35. University Chorus. (2) I and II. Mr. LAWTON
 Two hour-and-a-half rehearsals and one weekly section hour.
 Prerequisite: consent of the instructor. Course 35 may be repeated once without duplication of credit.
 NOTE.—See course 135.
65. Chamber Music Ensemble. (1) I and II. Mr. BOYDEN, ——
 Two class hours weekly.
 Open to any student of sufficient technical ability to take part in ensemble combinations for strings, wind instruments, piano. Students planning to enroll must consult with the instructor before the first meeting of the class. Course 65 may be repeated once without duplication of credit.
 NOTE.—See course 165.
75. University Symphony Orchestra. (2) I and II. Mr. DENNY, Mr. ELKUS
 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. Course 75 may be repeated once without duplication of credit.
 NOTE.—See course 175.

UPPER DIVISION COURSES

Theory

- 100A. Score-reading. (2) I. Miss HOWE
Prerequisite: course 4A-4B.
- 100B. Keyboard Harmony. (2) II. Miss HOWE
Prerequisite: course 4A-4B.
The reading of figured bass; sequences, modulations, etc., in the harmonic vocabulary of the 18th and 19th centuries.
101. Advanced Counterpoint. (3) I. Mr. STRICKLEN
Prerequisite: course 1.
102. Advanced Harmony. (3) I. Mr. STRICKLEN
Prerequisite: course 4A-4B.
- 105A-105B. Principles of Composition. (3-3) Yr. Mr. DENNY
- 107A-107B. Studies in Musical Analysis. (3-3) Yr. Mr. SESSIONS
Prerequisite: course 4A-4B.
108. Instrumentation. (3) I. Mr. DENNY
Prerequisite: course 4A-4B.
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.
- *110. Toward an Understanding of Music. (2) II. Mr. BLOCH

Performance

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.
Course 125 may be repeated once without duplication of credit.
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.
Course 135 may be repeated once without duplication of credit.
155. Advanced Piano Ensemble. (1) I and II. Mrs. PETRAY
Two class hours weekly.
Prerequisite: completion of 2 units in course 15.
Course 155 may be repeated once without duplication of credit.
165. Advanced Chamber Music Ensemble. (1) I and II. Mr. BOYDEN, ———
Two class hours weekly.
Prerequisite: completion of 2 units in course 65.
Course 165 may be repeated once without duplication of credit.

* Not to be given, 1946-1947.

175. Advanced University Symphony Orchestra. (2) I and II.

Mr. DENNY, Mr. ELKUS

Two hour-and-a-half rehearsals and one weekly section hour.

Prerequisite: completion of 4 units in course 75.

Course 175 may be repeated once without duplication of credit.

History and Literature

Courses in this group will be given in rotation: baroque, classic, romantic, modern. Prerequisite: course 30A-30B, or its equivalent, with the permission of the instructor.

Baroque Period

*116A. Survey of Musical Literature, 1600-1750. (3) II. Mr. BOYDEN
A survey of musical literature from Monteverdi to Handel and J. S. Bach.

*116C. The Fugues of the Well-Tempered Clavichord. (3) Mr. BLOCH

*116D. The Cantatas of J. S. Bach and the Oratorios of G. F. Handel. (3) Mr. BOYDEN

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.

*117B. The Operas of Mozart. (3) II. Mr. BUKOFZER

*117C. The String Quartets of Beethoven. (3) I. Mr. ELKUS

Romantic Period

118A. Survey of the Period from Weber and Schubert to the Beginning of Impressionism. (3) II. Mr. DENNY

Modern Period

119A. Modern French Music. (3) I. Mr. CUSHING
Critical and analytical studies of selected works of French composers from 1870 to the present, with special reference to Fauré, Debussy, and Ravel.

*119B. Selected Modern Works. (3) I. Mr. CUSHING
A critical and analytical study of Mussorgsky's *Boris Godunov*, Debussy's *Pelléas et Mélisande*, Ravel's *L'Heure Espagnole*, Bloch's *Schelomo*, Strawinsky's *Symphonie des Psaumes*, and Hindemith's *Mathis der Maler*.

Forms and Mediums

Choral Literature.

120A. Josquin des Prez to Handel. (3) I. Miss BACON

120B. Bach to the Present Day. (3) II. Mr. BOYDEN

Special Study Course

198. Group Special Study for Advanced Undergraduates. (2) I and II.
THE STAFF (Mr. BOYDEN in charge)

* Not to be given, 1946-1947.

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

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

201. Seminar: Studies in Orchestration. (2) II. Mr. CUSHING
202. Seminar in Comparative Harmony. (3) II. Mr. ELKUS
203. Seminars in Composition. (2-6) I and II.
Mr. SESSIONS (in charge), Mr. BLOCH, Mr. ELKUS
- *206A-206B. Seminar: Studies in Musical Form. (3-3) Yr. Mr. BUKOFZER
A retrospective survey of the principles of structure in music from the present to the Gregorian period.
- *210A-210B. Seminar in Early Music. (3-3) Yr. Mr. LAWTON
211. Seminar: Studies in Musical Research. (3) II. Mr. BOYDEN
Designed primarily to meet the needs of teachers for advanced work.
- *213. Seminar: Music of the Renaissance. (3) II. Mr. BUKOFZER
- *214. Seminar: Reading of Musical Theorists. (3) II. Mr. BUKOFZER
Reading and interpretation of theorists from the 16th century to the present.
- *221. Seminar: Studies in Classic and Romantic Music. (3) II. Mr. ELKUS
222. Seminar: The Concerto from the Baroque Period to the Present. (3) I.
Mr. BUKOFZER
- *236. Advanced Studies in the Fugues of the Well-Tempered Clavichord.
(2) II. Mr. BLOCH
250. Seminar in the Technique of Musicological Research. (2-4) I and II.
For prospective doctoral candidates. Mr. BUKOFZER
298. Special Studies. (2-4) I and II.
The STAFF (Mr. BUKOFZER in charge, fall semester;
Mr. ELKUS in charge, spring semester)
Credit to be arranged; maximum, 4 units a semester.
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

328. Methods of Teaching Vocal Techniques. (1) I and II. _____
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, 1946-1947.

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. CUSHING

Prerequisite: course 108.

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. CUSHING

Prerequisite: course 108 completed or taken concurrently. Not open to juniors.

The theory and practice of directing choral and instrumental ensembles.

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 in the field of the teaching major or minor.

*445B. Oboe. (½) I and II. _____

445D. Bassoon. (½) I. Fee, \$5. Mr. KUBITSCHEK

455A. French Horn (½) I. Fee, \$5. Mr. TRUTNER

*455C. Trombone. (½) I and II. _____

*475A. Violin and Viola. (½) I. Fee, \$5. _____

*475D. Stringed Bass; Tuba. (½) I and II. _____

* Not to be given, 1946-1947.

NAVAL SCIENCE AND TACTICS

- WILLIAM WHITE, Captain, U.S.N.; Professor of Naval Science and Tactics (Chairman of the Department).
- JOHN C. NICHOLS, Commander, U.S.N.; Associate Professor of Naval Science and Tactics.
- ROBERT B. HUTCHINS, Lieutenant Commander, U.S.N.R.; Assistant Professor of Naval Science and Tactics.
- JOSEPH F. ILLICK, Lieutenant Commander, U.S.N.R.; Assistant Professor of Naval Science and Tactics.
- WELLS B. McCURDY, Lieutenant Commander, U.S.N.R.; Assistant Professor of Naval Science and Tactics.
- JOSEPH J. SCHMIDT, Lieutenant, U.S.N.; Assistant Professor of Naval Science and Tactics.
- HENRY B. DUNLAP, Lieutenant, U.S.N.R.; Assistant Professor of Naval Science and Tactics.
- HAYWARD C. PARISH, JR., Lieutenant, U.S.N.R.; Assistant Professor of Naval Science and Tactics.
- ARTHUR L. ADAMS, Captain, U.S.M.C.; Assistant Professor of Naval Science and Tactics.
- ROBERT W. TUCKER, Ensign, U.S.N.R.; Assistant in Naval Science and Tactics.

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 81.

Courses in this department are restricted to students who are regularly enrolled members of the Naval Reserve Officers' Training Corps. Applications will be accepted from 100 freshman students for enrollment in the Naval R.O.T.C. Additional applications will be accepted from advanced students, within the limit of quota, who because of previous military or naval training can satisfy the Department of Naval Science and Tactics that they have received instruction equivalent to one or more naval science courses in the Naval R.O.T.C. curriculum; and from students without such training who have completed one or two semesters of college work. Candidates of either type must be able to meet all the requirements of the Naval R.O.T.C. curriculum before graduation, without seriously interfering with the academic work required for a bachelor's degree.

LOWER DIVISION COURSES

- 1A. Introduction to Naval Science. (3) I. Mr. PARISH, Mr. TUCKER
Orientation, basic naval administration, naval justice, naval customs, basic seamanship.
- 1B. Communications and Tactics. (3) II. Mr. PARISH, Mr. TUCKER
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 routine.
- 2A. Ordnance and Fire Control. (3) I. Mr. HUTCHINS
Ordnance equipment, weapons, explosives, small arms; fire control apparatus, fire control problems and principles.

- 2B. Fire Control. (3) II. Mr. HUTCHINS
Prerequisite: course 2A.
Sound and electronic devices; advanced fire control.

UPPER DIVISION COURSES

- 101A. Navigation. (3) I. Mr. SCHMIDT, Mr. McCURDY
Piloting, celestial navigation, aerial navigation, elementary astronomy;
charts and instruments.
- 101B. Advanced Seamanship. (3) II. Mr. SCHMIDT, Mr. McCURDY
Maneuvering board, tactical publications, Jorby Escort Trainer and
escort tactics, Sangamo Attack Teacher and antisubmarine attacks; combat
information center.
- 102A. Naval Engineering. (3) I. Mr. PARISH
Naval boilers and auxiliaries; naval steam turbines.
- 102B. Naval Engineering and Damage Control. (3) II. Mr. PARISH
Prerequisite: course 102A.
Naval Diesel engines; deck and bulkhead construction of naval vessels;
compartmentation; damage control methods; stability; fire and gas protection
methods.
- Candidates for commissions in the Marine Corps will be required to complete
Naval Science 1A, 1B, 2A, 2B, and 101A. In place of Naval Science 101B, 102A,
and 102B, they may be allowed to take courses in Marine Corps subjects as
follows:
103. Military Principles. (3) I and II. Mr. ADAMS
Marine Corps mission and organization; military history; principles
of war and basic military training; doctrines of combat; small arms.
104. Tactics and Technique. (3) I and II. Mr. ADAMS
Machine gun platoon and rifle company tactics; mortar section tactics,
special operations, combat intelligence; logistics.
105. Amphibious Operations. (3) II. Mr. ADAMS
History of amphibious operations, types of landing craft and ships, fire
support, ship to shore movement, logistics, landing team administration.

NOTE.—All students enrolled in the Naval Reserve Officers' Training Corps
are required to engage in drill or practical exercises three hours weekly.

NEAR EASTERN LANGUAGES

WALTER J. FISCHER, Ph.D., Professor of Semitic Languages.

HENRY L. F. LUTZ, Ph.D., D.D., Professor of Egyptology and Assyriology
(Chairman of the Department).

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 81.

Departmental Major Adviser: Mr. LUTZ.

Preparation for the Major.—Near Eastern Languages 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 Near Eastern Languages 13A-13B, or 25A-25B.

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.

21A-21B. Elementary Hebrew. (3-3) Yr. Mr. FISCHER
Course 21A-21B or a satisfactory equivalent in other languages is prerequisite to all upper division language courses in the department.

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. FISCHER

†141A-141B. Elementary Syriac. (2-2) Yr. Mr. FISCHER

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

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

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

224A-224B. Advanced Biblical Hebrew. (2-2) Yr. One or more of the prophetic and poetical books, with special attention to literary form.	Mr. FISCHER
227A-227B. Post-Biblical Hebrew. (1-1) Yr. Unvocalized texts.	Mr. FISCHER
231A-231B. Advanced Arabic. (3-3) Yr. Selections from (A) Historical works; (B) The Thousand and One Nights.	Mr. FISCHER
232A-232B. Advanced Arabic. (3-3) Yr. In alternate years: (A) The Koran. (B) Poetry.	Mr. FISCHER
241A-241B. Advanced Syriac. (2-2) Yr.	Mr. FISCHER
†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. FISCHER
*290A-290B. Special Study. Credit according to work accomplished.	Mr. LUTZ, Mr. FISCHER

* Not to be given, 1946-1947.

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

NURSING

- PEARL CASTILE, R.N., M.A., Assistant Professor of Nursing.
 M. OLWEN DAVIES, R.N., B.S., M.A., Assistant Professor of Nursing.
 ALICE E. INGMIRE, R.N., B.S., Assistant Professor of Nursing.
 KATHERINE W. KENDALL, R.N., B.S., Assistant Professor of Nursing.
 AMY A. MACOWAN, R.N., M.A., Assistant Professor of Public Health Nursing.
 BARBARA A. MUNSON, R.N., B.S., B.N., Assistant Professor of 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.
 MARJORIE A. GOMMEL, R.N., B.S., Instructor in Nursing.
 ALICE M. GROVES, R.N., A.B., M.N., Instructor in Nursing.
 MARY T. HARMS, R.N., B.S., Instructor in Nursing.
 ANN HILL, 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.
 MARGARET PETERSEN McMURRAY, R.N., M.A., Instructor in Psychiatric Nursing.
 GRACE S. BODENHAMER, A.B., M.A., Lecturer in Home Economics.
 MIRIAM F. LAYCOOK, R.N., B.S., Evening Instructor in Nursing in the University Hospital.

MEMBERS OF OTHER DEPARTMENTS GIVING INSTRUCTION IN THE
 DEPARTMENT OF NURSING

- HAMILTON H. ANDERSON, M.D., Professor of Pharmacology.
 LOIS H. BROCK (Lois Brock Watson), A.B., M.D., Lecturer in Obstetrical and Gynecological Nursing.
 PETER COHEN, B.S., M.D., Lecturer in Pediatrics.
 PORTIA BELL HUME, A.B., M.D., Assistant Professor of Psychiatry.
 VERA M. KEYLIN, M.A., Lecturer in Social Welfare (for the spring semester).
 JOHN B. LAGEN, M.D., Lecturer in Medical Nursing (for the spring semester).
 ALICE POTTER, A.B., M.D., Assistant Clinical Professor of Pediatrics.
 MILTON ROSENTHAL, M.D., Lecturer in Pathology.
 ALEX C. SHERRIFFS, M.A., Lecturer in Psychology.
 ALEXANDER SIMON, M.D., Associate Professor of Psychiatry.
 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. Miss MACOWAN
A study of public health nursing functions and activities.
419. The Field of Public Health Nursing. (3) I and II. Miss MACOWAN
Consideration of the essentials of a good public health nursing service.
420. Field Work in Public Health Nursing. (8) I and II. ———
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 25 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) II. Miss TRACY
Prerequisite: Education 110, Nursing 432, 434, and the consent of the instructor.
432. Principles of Nursing Education. (2) I. Miss TRACY, Miss NEWTON
Required of all candidates for the Certificate in Nursing Education.
434. Principles of Ward Management and Teaching. (3) II. Miss CASTLE
Prerequisite: Education 110, Nursing 432 or the 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.

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) II. Miss DAVIES
417. Social Problems of Nursing Service. (2) I. Miss DAVIES
418. The Nurse in Public Health. (3) I. Miss DAVIES
Parallels Nursing 418 given at Berkeley.
- 418E. Community Nursing. (2) I and II. Miss DAVIES, Miss HILL
421. History of Nursing. (2) I. Miss NEWTON

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

423. Professional Adjustments. (1) II. Miss LOTSPEICH
425. Pathology. (1) I. Mr. ROSENTHAL
- 427A-427B. Pharmacology and Therapeutics. (2-1) Yr.
Miss BINHAMMER, Mr. ANDERSON
435. Introduction to Nursing Arts. (5) I. Mrs. INGMIRE, Miss GOMMEL
437. Introduction to Medical and Surgical Nursing. (1) II. Mrs. INGMIRE
- 440A. Principles of Medicine. (2) II. Mr. LAGEN, Miss TORREY
- 440E. Medical Nursing. (3) I and II. Miss BINHAMMER
- 440F. Medical Nursing. (2) I and II. Miss BINHAMMER
- 441A. Principles of Psychiatry. (1) I and II. Mrs. HUME, Mr. SIMON
- 441E. Psychiatric Nursing. (2) I and II. Mrs. McMURRAY
- 442A. Principles of Surgery. (3) II. ———, Miss BROCK
- 442E. Surgical Nursing. (3) I and II. Miss LOVELAND, Miss GROVES
- 442F. Surgical Nursing. (2) I and II. Miss LOVELAND, Miss HARMS
- *444A. Principles of Pediatrics. (2) ———
- 444E. Pediatric and Communicable Disease Nursing. (2) I and II.
Miss MUNSON
446. Principles of Communicable Diseases. (2) I. Miss POTTER
- 448A. Principles of Obstetrics. (2) I. Miss BROCK
- 448E. Obstetrical Nursing. (2) I and II. Miss KENDALL

HOME ECONOMICS

103. Elementary Nutrition. (3) I. Miss GILLUM, Mrs. BODENHAMER
Parallels Home Economics 103 given at Berkeley.
104. Diet Therapy. (3) II. Miss GILLUM, Mrs. BODENHAMER
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. ———
Parallels Public Health 145 given at Berkeley.

SOCIAL WELFARE

100. The Field of Social Welfare. (3) I and II. Mrs. KEYLIN
Parallels Social Welfare 100 given at Berkeley.

* Not to be given, 1946-1947.

OCEANOGRAPHY*Marine Sciences*

Courses in oceanography leading to the master's or doctor's degree in oceanography and certain of the marine sciences are offered for a limited number of qualified students at the Scripps Institution of Oceanography at La Jolla, California. Detailed information concerning the courses may be found in the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES. For further information concerning the Institution refer to the Registrar of the University of California, 405 Hilgard Avenue, Los Angeles 24, or write to the Director of the Institution.

OPTOMETRY

KENNETH B. STODDARD, Ph.D., Associate Professor of Physiological Optics and Optometry (Chairman of the Department).

RALPH S. MINOR, Ph.D., Professor of Physics and Optometry, Emeritus.

MEREDITH W. MORGAN, JR., Ph.D., Assistant Professor of Optometry.

SHERBURNE F. COOK, Ph.D., Lecturer in Optometry and Professor of Physiology.

OWEN C. DICKSON, M.D., Lecturer in Ocular Pathology and Clinical Instructor in Ophthalmology, Medical School.

JACK T. HOBSON, B.S., Lecturer in Optometry.

FREDERICK L. MASON, M.A., Lecturer in Optometry.

For the curriculum in optometry in the School of Optometry, see earlier pages of this Catalogue.

Laboratory Fees.—Optometry 401A–401B, 406A–406B, \$17.50 a semester; 499 (if clinical practice included), \$8.75 per unit.

UPPER DIVISION COURSES

Prerequisite.—Physics 2A–2B, 3A–3B, Chemistry 1A–1B, Physiology 1A, 1C, together with all prerequisite courses, and the degree of Associate in Arts are prerequisite to all courses in the School of Optometry.

101A*–101B. Advanced Geometrical Optics. (3–3) Yr.

I: 101A* (Mason); II: 101B (Hobson). Mr. MASON, Mr. HOBSON
Prerequisite: Physics 108A–108B. (These courses are not required for the Certificate in Optometry.)

102A–102B. Elementary Theoretical Optometry. (3–4) Yr.

Mr. HOBSON, Mr. MASON

1 unit of laboratory will be given in the second semester.

103A–103B. Advanced Theoretical Optometry. (3–3) Yr.

Mr. MASON

Prerequisite: course 102A–102B.

401A–401B. Practical Optics. (2–2) Yr.

Mr. MORGAN

Lecture and laboratory.

Laboratory fee, \$17.50 a semester.

404A–404B. Practical Optometry. (3–3) Yr.

Mr. HOBSON

Prerequisite: courses 102A–102B and 401A–401B.

406A–406B. Optometry Clinic. (1–1) Yr.

Mr. HOBSON, Mr. MASON, Mr. MORGAN, Mr. STODDARD
and Assistants

Prerequisite: courses 401A–401B, 102A–102B, Physiology 115. Laboratory fee, \$17.50 a semester.

407A–407B. Pathology of the Eye. (2–1) Yr.

Mr. DICKSON

Prerequisite: Anatomy 102, Physiology 115.

* Not to be given, 1946–1947.

499. Special Study for Advanced Undergraduates. (1-2) I and II.
 (Not required for the Certificate in Optometry.) The STAFF
 Fee, \$8.75 per unit if clinical practice is included.

PHYSIOLOGICAL OPTICS

UPPER DIVISION COURSE

- 105A-105B. Physiological Optics. (4-4) Yr. Mr. STODDARD
 Lecture and laboratory.
 Prerequisite: Physics 108A-108B, Anatomy 102, Physiology 115, Psychology 1A-1B. Laboratory fee, \$11.50 a semester.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

- 201A-201B. Seminar in Advanced Physiological Optics. (2-2) Yr.
 Beginning each semester. Mr. STODDARD, Mr. MORGAN
 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. STODDARD, Mr. MORGAN
 A consideration of the precise nature of binocular vision and monocular and binocular space perception.
205. Color Vision. (1) II. Mr. STODDARD
 A study of color vision, both normal and abnormal, with a critical analysis of the various theories of color vision.
- 299A-299B. Research. (2-8; 2-8) Yr. Mr. STODDARD, Mr. MORGAN

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.)

ORIENTAL LANGUAGES

PETER A. BOODBERG, Ph.D., Professor of Oriental Languages (Chairman of the Department).

*FERDINAND D. LESSING, Ph.D., Agassiz Professor of Oriental Languages.

FLORENCE WALNE FARQUHAR, M.A., Associate Professor of Japanese.

ENSHO ASHIKAGA, M.Litt., Lecturer in Japanese.

SHIH-HSIANG CHEN, B.Litt., Lecturer in Chinese.

MARY HAAS, Ph.D., Lecturer in Siamese.

SUSUMU W. NAKAMURA, M.A., Lecturer in Japanese.

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 81.

Departmental Major Adviser: Mr. BOODBERG.

Preparation for the Major.—Required: Oriental Languages 1A-1B and 17 for students of Chinese; and 9A-9B or 29A-29B and 17 for students of Japanese.

The Major.—At least 16 of the 24 upper division units required for the major must be in language courses in Chinese or Japanese; the remaining 8 must include 4 units of the following: Oriental Languages 112, 132, 172A, 182, 188; Classics 193, 194. Recommended: a reading knowledge of French or German; Botany 150A.

Where no time is specified, hours may be arranged as far as possible to meet the convenience of students. The reading matter, where no text is specified, may be arranged according to needs or desires of the students.

LOWER DIVISION COURSES

- 1A-1B. Elementary Modern Chinese. (4-4) Yr. Mr. CHEN and Assistant
- †8A. Elementary Malay. (2) I. Mr. BOODBERG
- 9A-9B. Elementary Modern Japanese. (4-4) Yr.
I: 9A (Nakamura); 9B (Ashikaga). Mr. ASHIKAGA, Mr. NAKAMURA
II: 9B (Nakamura).
Not open to students with previous experience in the language.
13. Classical Chinese. (2) II. Mr. BOODBERG
- 17A. Introduction to the Study of Chinese Characters and to Sino-Japanese.
(2) I and II. Mr. BOODBERG
- 29A-29B. Japanese Oral and Written Composition. (4-4) Yr.
Mr. NAKAMURA

LECTURE COURSES

32. Evolution of Japanese Civilization before 1868. (2) I. Mrs. FARQUHAR

* Absent on leave, 1946-1947.

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

42. Chinese Civilization in the Asiatic Context. (2) I. Mr. BOODBERG
 A general survey of the development of Chinese civilization from antiquity to the Mongol conquest with emphasis on China's interrelations with the other cultures and civilizations of Asia.

UPPER DIVISION COURSES

- 101A-101B. Intermediate Chinese. (3-3) Yr. Mr. CHEN
- 109A-109B. Intermediate Japanese. (3-3) Yr. Mrs. FARQUHAR
113. Chinese Classics. (2) I. Mr. BOODBERG
 Recommended to be taken concurrently with 182.
117. Logography and the Evolution of the Chinese Language and Script.
 (2) II. Mr. BOODBERG
 Open to students of Japanese.
 Recommended to be taken concurrently with 188.
- 119A-119B. Third-Year Japanese. (2-2) Yr. Mrs. FARQUHAR
- 121A-121B. Advanced Chinese. (3-3) Yr. Mr. CHEN
- 129A-129B. Literary Japanese. (2-2) Yr. Mr. ASHIKAGA
- †154. Mongolian. (2) II. Mr. LESSING
- †164. Tibetan. (2) II. Mr. LESSING
- 174A-174B. Siamese (Thai). (2-2) Yr. Mrs. HAAS
- †198. Special Study for Advanced Undergraduates. (1-3) I and II.
 Mr. BOODBERG, Mr. LESSING, Mrs. FARQUHAR, Mr. CHEN, Mr. ASHIKAGA
- Chinese*: Classical and Historical Texts. I and II. Mr. BOODBERG
 Literature. I and II. Mr. CHEN
 Religious and Philosophical Texts. II. Mr. LESSING
- Japanese*: Historical Texts. I and II. Mr. ASHIKAGA
 Literature. I and II. Mrs. FARQUHAR
 Religious and Philosophical Texts. I and II. Mr. ASHIKAGA
- †199. Special Individual Study. (1-5) I and II.
 The STAFF (Mr. BOODBERG in charge)

LECTURE COURSES

Prerequisite: junior standing.

112. Survey of Chinese Literature and Literary Criticism. (2) II. Mr. CHEN
132. History of Japanese Literature. (2) II. Mrs. FARQUHAR
 Prerequisite: course 32.
 From the beginning to modern times, emphasizing Chinese, Buddhist and Western influences.

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

- 172A. Buddhism as a Cultural Factor in the Far East. (2) II. Mr. LESSING
182. Life and Times of Confucius. (1) I. Mr. BOODBERG
188. Philological Method: Languages and Literature of Eastern Asia. (1) II.
Mr. BOODBERG

GRADUATE COURSES

- 250A-250B. Research. (1-4; 1-4) Yr. Mr. BOODBERG, Mr. LESSING
251A-251B. Research. (1-4; 1-4) Yr. Mrs. FARQUHAR

PALEONTOLOGY

CHARLES L. CAMP, Ph.D., Professor of Paleontology and Director of the Museum of Paleontology (Chairman of the Department).

RALPH W. CHANEY, Ph.D., Professor of Paleontology and Curator of the Paleobotanical Collection 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 Curator 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 81.

Departmental Major Adviser: Mr. CAMP.

Preparation for the Major.—Two types of major programs are organized on the basis of relationships to geological sciences and to biological sciences.

Required: Botany 1A-1B, or Zoölogy 1A-1B; Geology 1A-1B; Paleontology 1, 2, and 3; matriculation chemistry or physics. For the majors emphasizing geology, Mineralogy 4A and 4B are also required.

Recommended: Chemistry 1A-1B; Botany 16 (3) for II (c); 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: Paleontology 102 (4), 103 (4), and 104 (4); Geology 102A-102B (4), 103 (4), 116 (2) and 107 (2) or 117 (3), and Engineering 1A-1B (3-3). Recommended: Zoölogy 112 (3).

(b) Emphasis on vertebrate paleontology: Paleontology 113 (3), and 114 (3), 115 (3); Geology 102A-102B (4), and 103 (4); Zoölogy 113 (4) or 106 (4), and 114 (3).

(c) Emphasis on paleobotany: Paleontology 120 (3), and 121 (3); Botany 110A-110B (6); Geology 102A-102B (4) and 103 (4); and at least 4 units chosen from Paleontology 102 (4), 114 (3).

II. Paleontology and Biological Sciences.

(a) Emphasis on invertebrate paleontology: Paleontology 102 (4), 103 (4), and 104 (4); Zoölogy 112 (3) or 108 (3), 114 (3); and at least 8 units chosen from Paleontology 105A-105B (4), 113 (3), 114 (3), 120 (3), and Zoölogy 110 (4).

(b) Emphasis on vertebrate paleontology: Paleontology 113 (3), 114 (3), 115 (3); Zoölogy 106 (4), 113 (4), 114 (3); and at least 4 units chosen from Paleontology 102 (4), 120 (3).

(c) Emphasis on paleobotany: Paleontology 120 (3), 121 (3); Botany 110A-110B (6), and 151 (3); Forestry 114 (3); and at least 6 units chosen from Paleontology 102 (4), 103 (4), 114 (3).

Honor Students in the Upper Division.—Honors are awarded on the basis of excellent work in the major subject.

Laboratory Fees for courses 102, 103, 105A–105B, are \$2.50 a semester.

LOWER DIVISION COURSES

1. General Paleontology. (3) I. Mr. CAMP, Mr. WELLES
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. Lectures, field trips, and laboratory. Enrollment limited to twenty.
10. General Paleontology. (3) II. 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.
- †2. Introductory Invertebrate Paleontology. (3) I. _____
Lectures and laboratory.
Prerequisite: course 1 or Geology 1B.
3. Introductory Vertebrate Paleontology. (3) II. Mr. CAMP
Lectures and laboratory. Prerequisite: course 1 or Zoölogy 1A, or Geology 1B, or Anthropology 1A. Enrollment limited to 20.

UPPER DIVISION COURSES

- †102. Invertebrate Paleontology. (4) I and II. _____
Lectures and laboratory. Prerequisite: Geology 1A, 1B, Paleontology 1, and in addition, either Zoölogy 1A or Paleontology 2 or Geology 102A, 102B. Fee, \$2.50.
103. Invertebrate Paleontology and Stratigraphy of the Late Mesozoic and Tertiary of North America. (4) I and II. _____
Lectures and laboratory.
Seven all-day field trips. Prerequisite: course 102. Fee, \$2.50.
- †105A–105B. Microscopic Paleontology. (2–2) Yr. Beginning each semester. _____
Prerequisite: course 102. Fee, \$2.50 a semester. Enrollment limited to 10 students.
(A) Recent Pacific and Atlantic faunas; (B) Tertiary faunas.
109. Tertiary History of the West Coast of North America. (2) II. _____
Prerequisite: courses 102 and 103; the latter may be taken concurrently.
- †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.

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

115. History and Ecology of Vertebrate Life of the Cenozoic. (3) II.
Lectures 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 the permission 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. CAMP in charge)

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

- †205. Seminar in Vertebrate Paleontology. (1) I and II. Mr. CAMP
206. Seminar in Invertebrate Paleontology. (1) II. ———
Current literature and general problems.
- †207. Seminar in Paleobotany. (1) I and II. Mr. CHANEY
Current literature and general problems.
- †208. Research in Paleontology. I and II. The STAFF (Mr. CAMP 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 the year 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. A public exhibition gallery is on the second floor of the Hearst Memorial Mining Building. Anyone interested in employing the facilities of the Museum may address the Director.

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

PHILOSOPHY

GEORGE P. ADAMS, Ph.D., Mills Professor of Mental and Moral Philosophy and Civil Polity.

WILLIAM R. DENNES, D.Phil., Professor of Philosophy (Chairman of the Department).

JACOB LOEWENBERG, Ph.D., Professor of Philosophy.

² DONALD S. MACKAY, Ph.D., Professor of Philosophy.

PAUL MARHENKE, Ph.D., Professor of Philosophy.

STEPHEN C. PEPPER, Ph.D., Professor of Philosophy and Aesthetics.

EDWARD STRONG, Ph.D., Associate Professor of Philosophy.

ISABEL C. HUNGERLAND, Ph.D., Lecturer in Philosophy.

KINGSLEY B. PRICE, Ph.D., 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 81.

Departmental Major Adviser: Mr. DENNES.

Preparation for the Major.—Philosophy 10A-10B and 12.

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 three 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. Two sections in 6A will be given in the second semester.)

6A-6B. Introduction to Philosophy. (3-3) Yr. Beginning each semester.

Mr. ADAMS, Mrs. HUNGERLAND, Mr. LOEWENBERG, Mr. PEPPER,

Mr. PRICE, Mr. MACKAY, Mr. STRONG

First semester: Sections 1, 2, 3, 4 in 6A and Sections 5, 6, in 6B.

Second semester: Sections 1, 2, 3, 4, in 6B and Section 5, 6, in 6A.

Weekly section meetings for discussion and written work.

² In residence spring semester only, 1946-1947.

SOPHOMORE COURSES

- 10A-10B. History of Philosophy. (3-3) Yr. Mr. DENNES, Mr. MACKAY
 I. From the Pre-Socratics to Plotinus.
 II. From the Scholastics to the Utilitarians.
12. Logic. (3) I. Mr. MARHENKE
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 Philosophy 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
- *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 six units in aesthetics. 136C may be taken in addition to both 136A and 136B without loss of credit.
146. Philosophy in Literature. (3) I. 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.

GROUP B

Courses dealing with the methods of reflective thinking and the more general features of experience.

- *102. Recurrent Types of Philosophy. (3) Mr. LOEWENBERG
- *111. Metaphysics. (3) Mr. LOEWENBERG

* Not to be given, 1946-1947.

113. Logic. (3) II.	Mr. MARHENKE
*114. Theory of Knowledge. (3) II.	Mr. MARHENKE
*122. Philosophy of Mind. (3)	Mr. ADAMS
124A-124B. Philosophy of Science. (3-3) Yr.	Mrs. HUNGERLAND
125. Theory of Value. (2) II.	Mr. PEPPER
135. Contemporary Tendencies in Philosophy. (3) I.	Mr. STRONG
147. Philosophy of History. (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)	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) I.	Mrs. HUNGERLAND
118. Spinoza. (3) I.	Mr. DENNES
119. British Empiricism with Special Reference to Hume. (3) I.	Mr. PRICE
121. Hobbes. (3) II.	Mr. DENNES
126. Social Philosophy of the Hellenistic Age. (3) I.	Mr. PRICE
129. Leibniz. (3) I.	Mr. MARHENKE
*130. Materialism and Naturalism. (3) II.	Mr. STRONG
Historical and critical studies of the chief philosophical materialists from Democritus to Dewey.	
*145. American Philosophy. (3)	Mr. MACKAY
199. Special Study for Advanced Undergraduates. (1-4) I and II.	The STAFF (Mr. DENNES in charge)

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

*204. Seminar in Ethics. (2)	Mr. ADAMS
210A-210B. Seminar in History of Philosophy. (2-2) Yr.	Mr. LOEWENBERG
†213A-213B. Seminar in Logic. (2-2) Yr.	Mr. MARHENKE
214. Seminar in the Theory of Knowledge. (3) II.	Mrs. HUNGERLAND

* Not to be given, 1946-1947.

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

- *216. Seminar in Plato. (2) Mr. MACKAY
- *220. Seminar in Pragmatism. (2) Mr. MACKAY
- *225. Seminar: Theory of Value. (2) Mr. PEPPER
232. Seminar in Philosophical Naturalism. (2) I. Mr. DENNES
- *236. Aesthetics from the Metaphysical Standpoint. (2) II. Mr. PEPPER
- *237. Seminar in the Philosophy of Art. (2) Mr. LOEWENBERG
- *247. Seminar in Philosophy of History. (2) Mr. STRONG
250. Special Studies. (1-6) I and II. The STAFF (Mr. DENNES in charge)
Enrollment in Philosophy 250 is ordinarily restricted to students who
have been admitted to candidacy for the doctor's degree.

* Not to be given, 1946-1947.

PHYSICAL EDUCATION

FREDERICK W. COZENS, Ph.D., Professor of Physical Education and Director of Physical Education (Chairman of the Department).

ANNA ESPENSCHADE, Ph.D., Associate Professor of Physical Education.

†PAULINE HODGSON, Ph.D., Associate Professor of Physical Education.

LOUISE S. COBB, Ph.D., Associate Supervisor of Physical Education.

LUCILE K. CZARNOWSKI, M.S., Associate Supervisor of Physical Education.

MARIE H. GLASS, A.B., Associate Supervisor of Physical Education.

FRANKLIN M. HENRY, Ph.D., Associate Professor 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.

JACK E. HEWITT, Ed.D., Assistant Professor of Physical Education.

SARAH R. DAVIS, A.B., Assistant Professor of Physical Education, Emeritus.

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.

ANNA M. HANLIN, M.S., Junior Supervisor of Physical Education.

CLINTON W. EVANS, B.S., Lecturer in Physical Education.

FRANK H. WICKHORST, B.S., Lecturer in Physical Education.

A. L. ALVES, Assistant in Physical Education.

The incidental fee payable by all students at the time of registration entitles students to the use of gymnasia, swimming pools, showers, towels, lockers, tennis courts and the athletic fields, also to the use of costumes for certain physical education activities, including swimming.

Recreational opportunities. At Hearst Gymnasium and at the Gymnasium for Men, rooms, courts, swimming pools, sports fields, and equipment for games 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. Groups of students may reserve a pool, gymnasium, etc., for their own use at stated times. Further information may be obtained from the Secretary, Room 200, Hearst Gymnasium.

Fee. Ice Skating, \$4.50 a semester.

Fines. Fines are imposed for each formal transaction necessitated by failure of the students 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, \$1. (b) Failure to return athletic supplies (balls, bats, etc.) on the date

† Miss Hodgson will serve as executive officer in the Division for Women.

of issue, \$1 for each twenty-four hours until the full purchase price of the article has been reached. (c) Failure to meet the appointment for the physical examination, \$1. (d) Overnight use of dressing locker, \$1. Failure to empty locker within designated time, \$1.

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 inter-collegiate athletics. The following activities are open to those found properly qualified: baseball, softball baseball, basketball, boxing, wrestling, fencing, crew, American football, touch football, rugby football, golf, gymnastics, body building, tumbling, handball, squash, *ice skating, badminton, hockey, soccer, swimming, diving, tennis, track, *folk dancing, *social dancing, trampoline, 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, diving, fencing, golf, hockey, *ice skating, life saving, softball, swimming, tennis, field sports.

Dancing: *modern dance, *folk, and *social dancing.

General Exercise: gymnastics, stunts and tumbling, rhythmic work, and training in standing and walking correctly. Designed especially for students who wish to maintain physical fitness.

27. Restricted Activities. ($\frac{1}{2}$) I and II.

The STAFF

28. Individual Exercise. ($\frac{1}{2}$) I and II.

The STAFF

Group exercises adapted to individual needs.

LOWER DIVISION COURSES FOR MEN AND WOMEN

Students will enroll at Hearst Gymnasium during the first week of the semester.

5A. First Aid. ($\frac{1}{2}$) I and II.

The STAFF (Miss ESPENSCHADE in charge)

(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.
 (Formerly numbered 34.) The STAFF (Miss ESPENSCHADE in charge)
 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. M Tu W Th.
 Folk dancing, ice skating (fee, \$4.50), 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: Physical Education 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
 Lecture and laboratory.
 Prerequisite: Physical Education 35 and Psychology 1A.
- 165A. Theory of Group Athletics. (3) II. Miss ESPENSCHADE, Miss HODGSON
 Lecture and laboratory.
 Prerequisite: course 101 is recommended.
- 165B. Theory of Gymnastics. (3) I. Miss COBB
 Lecture and laboratory.
 Prerequisite: course 101 is recommended. 165A is not prerequisite to 165B.
166. Theory of Individual Athletics. (2) II.
 (Formerly numbered 171.) Mrs. GLASS, Miss COLEMAN and the STAFF
 Prerequisite: a working knowledge of the activities included.

* Not to be given, 1946-1947.

UPPER DIVISION COURSES FOR MEN AND WOMEN

101. Kinesiology and Body Mechanics. (4) I. Miss BARTLETT
(Formerly numbered 151.)
Lecture 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 the normal physical conditions.
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.)
Lecture 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) II. Miss ESPENSCHADE
(Formerly numbered 120.)
Prerequisite: Psychology 1A.
Motor learning, facilitation and inhibition, motivation, set, reaction time, coördination efficiency, fatigue, emotion and personality in relation to physical activity; the psychology of athletic performance.
130. History and Principles of Physical Education. (3) II. Miss COBB
(Formerly numbered 175.)
Prerequisite: Physical Education 20, Physiology 1A-1C, and Psychology 1A.
- 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: Physical Education 130.
Organization of the instructional, intramural, recreational and competitive programs; criteria for the evaluation and selection of activities offered in each. The supervision and administration of gymnasium facilities and play areas; cost and maintenance of equipment; departmental organization, regulations and policies.
135. Tests and Measurements in Physical Education. (3) I. Mr. COZENS
(Formerly numbered 149.)
Prerequisite: Education 110 or consent of instructor.
The historical background of measurement in physical education; statistical techniques to be used in scoring tests; the construction and uses of tests; interpretation of results; evaluation of measures now available in the field; the administration of a testing program.

140. Community Recreation. (2) II.

Mrs. GLASS

Prerequisite: upper division standing.

The meaning and scope of recreation in the leisure time life of the American people. Purposes and programs of agencies concerned with recreation. Consideration of special types: industrial, commercial, home and neighborhood. Problems of leadership. Critical evaluation of representative surveys.

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.

Miss COBB

Prerequisite: upper division standing.

The meaning and significance of leisure in modern society; essential characteristics and uses of recreation; theories of play; the recreation movement in the United States.

143B. The Organization and Administration of Recreation. (3) II.

Prerequisite: Physical Education 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.)

Miss COBB, 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.)

Miss COBB, Mrs. GLASS, Mr. NEWSOM, Mr. PEASE

Prerequisite: Physical Education 144A.

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 the permission 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 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 hours laboratory to be arranged. Mr. KEENEY

304. The Theory and Teaching of Baseball. (1) II.

Mr. EVANS

Lecture and laboratory.

305. The Theory and Teaching of Basketball. (1) I.

Mr. NEWSOM

One lecture and two laboratory periods to be arranged.

Prerequisite: course 1 in basketball.

306. The Theory and Teaching of Court Sports. (1) I. Mr. MILLER
One lecture and two hours to be arranged.
Prerequisite: course 1 in tennis or consent of instructor.
308. The Theory and Teaching of Boxing and Wrestling. (1) I and II.
Prerequisite: course 1 in wrestling. Mr. STONE
310. The Theory and Teaching of Swimming, Diving and Water Polo. (1)
I and II. One lecture and two hours to be arranged. Mr. HEWITT
Prerequisite: course 1 in swimming.
311. The Theory and Teaching of Lifesaving and Water Safety. (1) I and II.
One lecture and two hours to be arranged. Mr. HEWITT
Prerequisite: candidates must hold an American Red Cross Senior Life-
saving Certificate, or have the consent of the instructor.
313. The Theory and Teaching of American Football. (1) II.
Lecture, laboratory, and two hours to be arranged. Mr. WICKHORST
320. Theory and Practice of Officiating in Football and Basketball. (1) I.
Lecture and laboratory, two hours. Mr. NEWSOM
- †322. The Theory and Teaching of Field Sports. (1) II. Mr. MILLER
Lecture and laboratory, two hours to be arranged.
Prerequisite: consent of instructor.

METHODS COURSE FOR MEN AND WOMEN

343. The Theory and Teaching of Recreational Activities. (1) II.
Mr. PEASE and the STAFF
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: course 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.—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, prac-
tices and procedures in the field; application of this training to the inde-
pendent solution of a problem.
- †231. Administration of Physical Education. (2) I. Mr. COZENS
(Formerly numbered 255.)
290. Research. (1-6) I and II. The STAFF (Mr. COZENS in charge)
(Formerly numbered 256.)

† 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.

J. ROBERT OPPENHEIMER, Ph.D., Professor of Physics.

EMILIO SEGRÈ, Ph.D., Professor of Physics.

HARVEY E. WHITE, 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.

WILLIAM J. RAYMOND, B.S., Professor of Physics, Emeritus.

HIRAM W. EDWARDS, Ph.D., Associate Professor of Physics.

CHARLES A. FOWLER, JR., Ph.D., Assistant Professor of Physics.

*WAYNE E. HAZEN, Ph.D., Assistant Professor of Physics.

AUGUST C. HELMHOLZ, Ph.D., Assistant Professor of Physics.

WOLFGANG PANOFSKY, Ph.D., Assistant Professor of Physics.

WILLIAM B. FRETTER, A.B., Associate in Physics.

LESTER L. SKOLIL, M.A., Associate in Physics.

HERSCHEL SNODGRASS, M.S., Associate in Physics.

JOSEPH W. WEINBERG, Ph.D., Lecturer in Physics.

MEDICAL PHYSICS

JOSEPH G. HAMILTON, M.D., Assistant Professor of Medicine, Associate Professor and Research Associate in Medical Physics.

JOHN H. LAWRENCE, M.D., Assistant Professor of Medicine, Associate Professor and Research Associate in Medical Physics.

HARDIN B. JONES, Ph.D., Instructor in Medical Physics.

CORNELIUS A. TOBIAS, Ph.D., Instructor in Medical Physics.

Letters and Science List.—All undergraduate courses in physics are included in the Letters and Science List of Courses. For regulations see page 81.

Departmental Major Adviser: Mr. LOEB

Preparation for the Major.—Required: Physics 1A-1B, 1C-1D (Physics 4A-4B-4C after 1946-1947), or their equivalents (under special circumstances Physics 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 Physics 105A-105B, 108B, 110A-110B,

* Absent on leave, 1946-1947.

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.

Honors.—No special courses are given for honor students. Such students may do special work under Physics 199.

Laboratory Fees.—The fee for Physics 1A-1B, 1C-1D, 3A-3B, 4A, and 2I is \$4.50 a semester; for 108A, 108B, 110C, \$7; and for Physics 199 (if laboratory), \$7 per unit. These fees cover the cost of materials used by the careful student. The cost of materials and breakage in excess of the estimated amount will be charged to the individual student. No fee or deposit is required for research course 295.

LOWER DIVISION COURSES

Courses 1A-1B, 1C-1D 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 1A, the order of taking 1B, 1C, 1D is immaterial. After 1946-1947, 1A-1B, 1C-1D will be replaced by 4A-4B-4C.

Prerequisite for all lower division courses except Physics 10 are (1) either high school physics or chemistry or Physics 10, (2) trigonometry (may be taken concurrently). The prerequisites for Physics 10 are elementary algebra and plane geometry.

1A-1B. General Physics. (3-3) Yr.

Mr. BRODE, Mr. FRETTER, Mr. LENZEN, Mr. SKOLIL

1A. I: Sec. 1 (Lenzen); Sec. 2 (———).

1B. I: Sec. 1 (Fowler); Sec. 2 (Skolil); II: (Brode)

Two lectures and one three-hour laboratory period.

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, chemistry, and architecture. Laboratory fee, \$4.50 a semester.

Mechanics, properties of matter, and heat.

Physics 1A will not be given after the fall semester, 1946, nor 1B after the spring semester, 1947.

1C-1D. General Physics. (3-3) Yr. Mr. FOWLER, Mr. JENKINS, Mr. LOEB

1C. I: Sec. 1 (Loeb); Sec. 2 (Loeb).

1D. II: Sec. 1 (Jenkins); Sec. 2 (Fowler).

Two lectures and one three-hour laboratory period.

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. Fee, \$4.50 a semester.

Magnetism, electricity, wave motion, sound and light, presented as a continuation of 1A-1B.

Physics 1C-1D will not be given after 1946-1947.

2A-2B. General Physics Lectures. (3-3) Yr. Beginning each semester.

Mr. EDWARDS, Mr. SKOLIL

Three lectures and one discussion section weekly.

2A. I: (Edwards); II: (Skolil).

2B. I: (Skolil); II: (Edwards).

Elective in the College of Letters and Science. Required for premedical students.

Mechanics, properties of matter, heat, sound, light, electricity and magnetism.

3A-3B. General Physics Laboratory. (1-1) Yr. Beginning each semester.

Mr. SNODGRASS

Required for premedical students. Recommended for all students who elect 2A-2B. Fee, \$4.50 a semester.

Mechanics, properties of matter, heat, sound, light, electricity and magnetism. Experimental work planned to accompany the lectures in 2A-2B.

4A. General Physics. (4) II.

Mr. ALVAREZ, Mr. LENZEN

Lectures: Sec. 1 (Lenzen); Sec. 2 (Alvarez).

Three lectures and one three-hour laboratory period.

Open to students in all colleges. Together with 4B-4C (to be given 1947-1948), required for students in the College of Letters and Science whose major subject is physics, and for students in engineering, chemistry, and architecture. (During 1946-1947 only, Physics 1A-1B may be substituted.) Laboratory fee, \$4.50.

Prerequisite: Mathematics 3A-3B, or its equivalent. Mathematics 3B may be taken concurrently.

Mechanics, properties of matter.

10. Descriptive Introduction to Physics. (3) I and II.

Mr. WHITE

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 Physics 1A, 1B, 2A, or 2B.

21. 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 1A-1B, 1C-1D in the semester indicated for each. A fee of \$4.50 a semester is charged in each course. Students should enroll under one or more of the following numbers:

21A. Mechanics and Properties of Matter. I and II.

21B. Properties of Matter and Heat. I and II.

21C. Electricity and Magnetism. II.

21D. Sound and Light. I.

31-32. Supplementary Lecture Courses in General Physics. (2)

LOWER DIVISION STAFF (Mr. LENZEN in charge)

These courses are intended primarily for students entering the University with partial credit in general physics. Courses 31A, 31B, 31C, 31D cover the lecture work of courses 1A-1B, 1C-1D; and courses 32A, 32B cover the lecture work in 2A-2B in the semester indicated for each. Students should enroll under one or more of the following numbers:

31A. Mechanics and Properties of Matter. I and II.

31B. Properties of Matter and Heat. I and II.

31C. Electricity and Magnetism. I.

31D. Sound and Light. II.

32A. Mechanics, Properties of Matter, Sound and Heat. I and II.

32B. Light, Electricity and Magnetism. I and II.

UPPER DIVISION COURSES

Physics 1A-1B, 1C-1D, and differential and integral calculus are prerequisite to all upper division courses except 108A-108B, Sec. 2.

- 104A-104B. Vector Analysis. (3-3) Yr. 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 invariantive formulation of physical laws.
- 105A-105B. Analytic Mechanics. (3-3) Yr. Mr. HELMHOLZ
 Fundamental principles of Newtonian mechanics.
- 108A. Geometrical Optics. (3) I. Mr. WHITE
 Lectures and laboratory.
 Prerequisite: course 2A-2B. Laboratory fee, \$7.
 Geometrical methods applied to the optics of mirrors, prisms, and lenses.
- 108B. Physical Optics. (3) I and II. Mr. FOWLER, Mr. WHITE
 Lectures, I: Sec. 1 (Fowler); II: Sec. 1 (White); Sec. 2 (Fowler).
 Two lectures and one three-hour laboratory period.
 Section 2 open only to students in Optometry.
 Course 108A is not prerequisite to 108B. Laboratory fee, \$7.
 The phenomena of diffraction, interference, polarization and their applications.
- 110A-110B. Electricity and Magnetism. (3-3) Yr. Mr. PANOFSKY, Mr. HELMHOLZ
 110A. I: (Panofsky); II: (———).
 110B. I (———); II: Helmholtz).
 Elementary and mathematical theory of electrostatics, magnetostatics, magnetism, steady and varying currents, electron theory, and electromagnetic waves.
- 110C. Advanced Electrical Laboratory. (1) I. Mr. BRODE, Mr. HELMHOLZ
 Sec. 1 (Helmholtz); Sec. 2 (Brode).
 Prerequisite: course 121. Fee, \$7.
 Use of electrical instruments; classical experiments of modern physics.
112. Heat. (3) 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. McMILLAN
 Theory of vibrations and wave motion, with applications to acoustics.
115. Introduction to Quantum Mechanics. (2) I and II.
 I: (Segrè) II: (McMillan). Mr. SEGRÈ, Mr. McMILLAN
 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. Mr. LOEB, Mr. SEGRÈ
 I: (Segrè); II: Loeb).
 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) I. 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: (Alvarez); II: (Segrè). Mr. ALVAREZ, Mr. SEGRÈ
 Discovery of radioactivity. α , β , and γ rays, theory of successive transformations, nature of radioactivity, artificial transmutations, nuclear structure.
125. Introduction to Medical Physics. (1) I. Mr. JOHN LAWRENCE in charge
 Application of recent advances in nuclear physics to biological and medical problems.
126. Biological Applications of Artificial Radioactivity. (3) II.
 Lectures and laboratory. Mr. HAMILTON
 Prerequisite: Chemistry 1A-1B, Physics 1A-1B, and one of the following: Zoölogy 1A-1B, Physiology 1A-1C, or Botany 1A-1B.
 The theory and methods used in the applications of artificial radioelements to research problems in the biological sciences.
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. Fee (if laboratory), \$7 per unit.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

- 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. Mr. BIRGE, Mr. JENKINS
 I: 208A (Jenkins); 208B (Birge). II: 208B (Birge).
 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. BRODE, Mr. WEINBERG
 I: 210A (Brode); 210B (Weinberg). II: 210B (Weinberg).
 Prerequisite: course 110A-110B and a working knowledge of differential equations.
 Electrostatics, electrodynamics, electron theory and special relativity, radiation in atomic problems.

- 211A-211B. Spectroscopy and Atomic Structure. (3-3) Yr. 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, including some discussion of the experimental methods.
212. Thermodynamics. (3) 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) I. Mr. WILLIAMS
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. OPPENHEIMER
Physical principles of quantum theory, correspondence, complementarity; atomic states and transitions; elementary atomic and nuclear collision problems.
- 223A-223B. Methods of Theoretical Physics. (3-3) Yr. Mr. WEINBERG
223B, I; 223A, II.
Systematic development of methods of quantum mechanics, electromagnetics, and statistical mechanics; methods of group theory in atomic problems; field theories.
224. Nuclear Physics. (3) II. Mr. SEGRÈ
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.
- †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 1946-1947 will include Seminar in Theoretical Physics (I and II, Oppenheimer, Weinberg), 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.)

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

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 and Lecturer in Optometry.

JAMES M. D. OLMSTED, Ph.D., Sc.D., Professor of Physiology (Chairman of the Division).

LESLIE L. BENNETT, Ph.D., M.D., Assistant Professor of Physiology.

D. HAROLD COPP, M.D., Ph.D., Assistant Professor of Physiology.

HARDIN B. JONES, Ph.D., Instructor in Physiology, and Instructor in Medical Physics.

Letters and Science List.—All undergraduate courses in physiology except 115 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Adviser: Mr. OLMSTED.

Preparation for the Major.—Required: Physiology 1A-1C (5); Physics 2A-2B (6); Chemistry 1A-1B (10), 8 (3). Recommended: Zoölogy 1A-1B; Anatomy 102; Chemistry 5 and 109; a knowledge of calculus; and a reading knowledge of French and German.

The Major.—The major must include Physiology 100A (3) 100B (3), 110A-110B (6), 112 (3); the following courses, if they are given while the student is in the upper division: 104A (2), 106 (2); sufficient additional units to make up the required 24 units may be selected from upper division courses in related departments, subject to the approval of the Chairman.

Laboratory fees for nonmedical students are as follows: course 1C, \$11.50; 112, \$20.50; 115, \$11.50. 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: high school chemistry. Not open to entering freshmen.
- 1C. Introductory Physiology, Laboratory. (2) I. Mr. COOK and Assistants
Prerequisite: course 1A completed or in progress. Fee, \$11.50.
Each laboratory section will be limited to 90 students. Preference will be given to those for whose major the course is required.

UPPER DIVISION COURSES

- 100A. General and Comparative Physiology. (3) II. Mr. COOK
Prerequisite: Chemistry 1A-1B, Physics 2A-2B and Physiology 1A-1C, or Zoölogy 1A-1B.
- 100B. General and Comparative Physiology. (3) I. Mr. COOK
Prerequisite: Chemistry 1A-1B, Physics 2A-2B and Physiology 1A-1C, or Zoölogy 1A-1B.

- 100D. General and Comparative Physiology. (3) II. Mr. JONES and Mr. COOK
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and Physiology 1A-1C or Zoölogy 1A-1B. Lectures on the physiological effects of radiation.
- 101M. Human Physiology. (8) II.
Mr. OLMSTED, Mr. CHAIKOFF, Mr. BENNETT,
Mr. COPP, and Assistants
Lectures, laboratory, and conferences or demonstrations.
Prescribed for, and limited to, students in the first year of the Medical School. (See ANNOUNCEMENT OF THE MEDICAL SCHOOL for statement of fees.)
102. Physiology of Growth and Development in the Child. (2) I. Mr. COPP
Prerequisite: Physiology 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: Physiology 1A-1C, or Zoölogy 1A-1B; or the 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.
- 110A-110B. Mammalian Physiology. (3-3) Yr.
Mr. OLMSTED, Mr. CHAIKOFF, Mr. BENNETT, Mr. COPP
(Formerly numbered 111.)
Prerequisite: Physiology 1A-1C, Physics 2A-2B, Chemistry 1A-1B, 8.
At the discretion of the instructor. Biochemistry 103 or Zoölogy 1A-1B may be substituted for Physiology 1A-1C.
A comprehensive survey of mammalian physiology.
112. Mammalian Physiology. Laboratory only. (3) II.
Mr. OLMSTED, Mr. CHAIKOFF, Mr. BENNETT,
Mr. COPP, and Assistants
Fee, \$20.50.
Prerequisite: course 110A-110B completed or in progress.
Course 112 covers the laboratory work of course 101M and is limited to 20 students.
115. Anatomy and Physiology of the Eye. (3) I. Mr. COOK in charge
Lectures and laboratory.
Prerequisite: Physiology 1A-1C. Fee, \$11.50.
Open to students in the Curriculum in Optometry and to those whose major is physiology.
199. Special Study for Advanced Undergraduates. (2-4) I and II.
The STAFF (Mr. OLMSTED in charge)
Prerequisite: courses 100A-100B, or 110A-110B.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

201A-201B. Research. (2-8; 2-8) Yr. The STAFF (Mr. OLMSTED in charge)

203. Seminar. (1) I.

Mr. OLMSTED

Designed to give students an acquaintance with recent physiological literature, and practice in making reports.

204. Seminar in the Endocrines. (1) I.

Mr. CHAIKOFF

Time to be arranged.

POLITICAL SCIENCE

- 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.
 HANS KELSEN, Ph.D., Professor of Political Science.
 AUSTIN F. MACDONALD, Ph.D., Professor of Political Science.
 SAMUEL C. MAY, M.A., LL.D., Professor of Political Science and Director
 of the Bureau of Public Administration.
 FRANK M. RUSSELL, Ph.D., Professor of Political Science. (Chairman of the
 Department).
 *O. W. WILSON, A.B., Professor of Police Administration.
 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.
 N. WING MAH, Ph.D., Associate Professor of Political Science.
 DWIGHT WALDO, Ph.D., Assistant Professor of Political Science.
 HAROLD WINKLER, Ph.D., Assistant Professor of Political Science.
-
- JOHN D. HOLSTROM, A.B., Lecturer in Political Science.
 BOYNTON KAISER, A.B., Lecturer in Political Science.
 GEORGE A. LIPSKY, A.B., Lecturer in Political Science.
 L. DEMING TILTON, B.S., Lecturer in Political Science and Architecture.

Letters and Science List.—All undergraduate courses in political science except 167A-167B, 168A-168B and 183 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Advisers: Mr. AIKIN, Mr. BELLQUIST, Mr. HARRIS, 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: Political Science 1, 2 (or 1A-1B as formerly given), and one of the following: Anthropology 1A-1B, Economics 1A-1B, Geography 1 and 2, History 4A-4B, 8A-8B, 17A-17B, Philosophy 6A-6B, Political Science 8, 9, Social Institutions 1A-1B, 5A-5B.

Fields of Study.—Instruction in the department falls into the following main fields: Political Theory and Public Law; International Relations; Government and Politics; Public Administration. Emphasis in one field is required of each major.

The Major.—Candidates' programs must be submitted to a departmental adviser for approval. The department will certify to the completion of a major program for graduation upon fulfillment of the following requirements:

1. Completion of at least 24 units of upper division courses in the major, of which 18 must be in political science. The 6 upper division units which may be taken in other departments must normally represent courses related to the candidate's field of emphasis and must be approved by his departmental adviser.

* Absent on leave, 1946-1947.

2. Inclusion of at least one course in each of the following four groups:

I. 100, 111, 112, 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, 182.

IV. 153, 155, 162, 167A, 167B, 168A, 168B, 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 of each semester.

LOWER DIVISION COURSES

1. Introduction to Government. (3) I and II. Mr. BELLQUIST
An introduction to the principles and problems of government, with particular emphasis on national government in the United States. This course is designed to fulfill the American Institutions Requirement.
Two lectures, and one section meeting weekly.
2. Introduction to Government. (3) II. Mr. LIPSKY
A comparative study of constitutional principles, governmental institutions, and political problems of selected governments abroad.
Two lectures, and one section meeting weekly.
8. Dictatorship and Constitutionalism. (3) I. Mr. WINKLER
Evolution of the broad patterns of European government in terms of dictatorship, constitutionalism, and bureaucracy; the acquisition, distribution, and loss of power; the functioning of political institutions in times of crisis.

UPPER DIVISION COURSES

Nonmajors who plan to take upper division courses in political science are strongly advised to take Political Science 1 and 2. Lacking these, or Political Science 1A-1B, students with satisfactory equivalents may be admitted to upper division courses with the permission of the instructor.

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.
112. Principles of Politics. (3) II. Mr. WINKLER
An analysis of the philosophical implications of different forms of political authority such as democracy, liberalism, fascism, socialism, and communism. Problems of communication between political societies based on natural law and on reason of state. Evaluation of institutional developments in each system.

113. American Political Theory. (3) I. 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
An analytical appraisal of recent thinking about American politics. The broader implications of selected economic, religious, and literary works. Basic problems such as force and persuasion, majority rule and minority rights, public opinion and propaganda discussed in the search for a philosophy for democracy.
117. Elements of Jurisprudence. (3) I. Mr. KELSEN
Fundamental legal principles, especially from the analytical, historical, philosophical, and sociological points of view. Particular attention will be given to modern theories of the function of law.
- 118A-118B. History of Political Theory. (2-2) Yr. Mr. GETTELL
- *119. The Development of American Federalism. (3) II. _____
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. AIKIN
(A) The federal system: Expansion of national authority; interstate barriers; separation of powers; admission of states to the Union; interstate compacts; constitutional amendment; 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, Mr. LIPSKY
Rise and development of the Western State system; problems of nationalism and imperialism, particularly in connection with the peace settlement following the Second World War.
124. International Organizations. (3) II. Mr. RUSSELL
International unions and commissions of the 19th 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 cooperation.

* Not to be given, 1946-1947.

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) II. 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) I. Mr. MAH
 China as a nation in the Oriental world; impact of the Occident upon China and its repercussions; the internal and external aspects of the struggle for the creation of a modern democratic state; China in international politics.
136. Problems of the Pacific Area. (3) II. Mr. MAH
 A discussion of the more important political issues and problems posed by the powers in their relations with each other in the Pacific.
138. International Relations of the Far East. (3) I. Mr. MAH
 A general survey.
139. The Problem of Colonialism in the Far East. (3) II. Mr. MAH
 A survey of colonial rule in the Far East, its changing status and resultant problems.
142. The Foreign Policy of the Soviet Union. (2) 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.

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. International experiences of labor as the vanguard of liberal values.

* Not to be given, 1946-1947.

141. Government of the Soviet Union. (3) I. Mr. LIPSKY
The peoples and resources of the Union; the Bolshevik Revolution of November, 1917; and 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). Mr. BELLQUIST
Constitutionalism and parliamentarism in the countries of Northern Europe—Denmark, Finland, Iceland, Norway, and Sweden. Development of their political institutions; war-time 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
Course 148A is not prerequisite to 148B.
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. (2) II. Mr. LIPSKY
Open to sophomores, juniors, and seniors, without prerequisites. Not open to Political Science majors nor to students who have taken Political Science I. Satisfies the American Institutions Requirement.
151. American National Government. (3) I. Mr. LIPSKY
Origin and development of the constitution; powers, functions, and interrelations of executive, administrative, legislative, and judicial branches of the government; expansions of governmental activities; the national party system. Not open to students who have taken Political Science I.
152. Political Parties in the United States. (3) I. Mr. HARRIS
The role of political parties in American government; organization and activities of parties; nominating systems, the conduct of elections, campaign techniques, voting and non-voting, the spoils system; the influence of parties on public policy and administration.

* Not to be given, 1946-1947.

*154. American Legislative Bodies. (3).

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.

*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

153. Comparative National Administration. (3) II.

Mr. WALDO

Main features of the administrative systems of selected modern States in comparison with that of the United States; comparative analysis of such matters as personnel, financial procedure, administrative law, and departmentalization; administrative systems in relation to constitutional structures, economic systems, historical traditions, and cultural patterns.

155. National Administration in the United States. (3) II.

Mr. MAY

History, organization, personnel, business methods and accomplishments of the various 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.

167A-167B. Principles of Police Organization and Administration. (3-3) Yr.

Enrollment only on consultation with the instructor. Mr. HOLSTROM

An introduction to the principles of police organization and administration, discussion of police statistics, criminal identification and investigation, and educational methods for combating crime and vice, and controlling traffic.

*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.

* Not to be given, 1946-1947.

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) II. 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.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146. 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. _____

* Not to be given, 1946-1947.

210. Seminar in Fundamental Concepts in Modern Political Thought. (2) II.
Mr. WINKLER
An intensive examination of the roots and development of the utilitarian and idealist political philosophies. Fundamental ideas such as progress, freedom, justice, and equality analyzed with reference to the philosophic-dialectic in the German tradition and the economic-statistical in the British school.
- 212A-212B. 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. The philosophical, historical, juristic, psychological, sociological, and statistical approaches to political problems; the theory of causation in the social sciences.
- 232A-232B. Seminar in International Relations. (2-2) Yr. Mr. RUSSELL
- 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. Mr. MAH
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 during and after the war.
- 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.
- 255A-255B. Seminar in Federal Administration. (2-2) Yr. Mr. MAY
Special studies in problems of federal administration.
- 257A-257B. 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. ———
- *261A-261B. Seminar in Municipal Administration. (2-2) Yr. Mr. HARRIS
- 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. HOLSTROM

* Not to be given, 1946-1947.

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

272. Seminar in State Administration. (2) II. Mr. MAY

273A-273B. Research in Public Personnel Administration. (2-2) Yr.

Mr. HARRIS, 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.

273A or equivalent training is prerequisite to 273B, or permission of the instructor.

*274A-274B. Public Expenditure and Financial Administration. (2-2) Yr.

Mr. HARRIS

*275A-275B. Research in the Administration of Criminal Justice. ———

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. MACDONALD in charge)

298. Individual Study. (1-4) I and II.

The STAFF (Mr. MACDONALD 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 arranging combinations of existing courses leading toward particular types of governmental service.

Further information may be obtained by consulting the Director, Mr. Samuel C. May, Room 113, Library.

BUREAU OF INTERNATIONAL RELATIONS

The Bureau of International Relations in 207 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 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.

* Not to be given, 1946-1947.

PSYCHOLOGY

OLGA L. BRIDGMAN, M.D., Ph.D., Sc.D., Professor of Psychology and Pediatrics.

WARNER BROWN, Ph.D., Professor of Psychology.

² HAROLD E. JONES, Ph.D., Professor of Psychology.

JEAN WALKER MACFARLANE, Ph.D., Professor of Psychology.

EDWARD C. TOLMAN, Ph.D., Professor of Psychology (Chairman of the Department).

ROBERT CHOATE TRYON, Ph.D., Professor of Psychology.

GEORGE M. STRATTON, Ph.D., Professor of Psychology, Emeritus.

CLARENCE W. BROWN, Ph.D., Associate Professor of Psychology.

² EGON BRUNSWIK, Ph.D., Associate Professor of Psychology.

EDWIN E. GHISELLI, Ph.D., Associate Professor of Psychology.

R. NEVITT SANFORD, Ph.D., Associate Professor of Psychology.

∇ JAMES A. HAMILTON, Ph.D., Assistant Professor of Psychology.

RHEEM F. JARRETT, A.B., Instructor in Psychology.

NANCY BAYLEY (Nancy Bayley Reid), Ph.D., Lecturer in Psychology.

ELSE FRENKEL-BRUNSWIK, Ph.D., Lecturer in Psychology.

JANE HAMILTON GULLBERG, A.B., Lecturer in Psychology.

ROBERT E. HARRIS, Ph.D., Lecturer in Psychology.

MARY C. JONES, Ph.D., Lecturer in Psychology.

ALEX C. SHERRIFFS, M.A., Lecturer in Psychology.

Letters and Science List.—All undergraduate courses in this department except 3, 104, 116, 117, 185, and 186 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Laboratory Fees.—A fee of \$3.50 is required in courses 106A, 106B, 108A, 108B, 151, 186; \$1.50 in 107; \$4.50 in 164.

Departmental Major Advisers: Miss BRIDGMAN, Mr. C. W. BROWN, Mr. TRYON.

Preparation for the Major.—Required: Psychology 1A, 1B, and 5, and either Physiology 1A, 1C, or Zoölogy 1A-1B. Recommended: French, German, chemistry, physics. Note that second-year high school algebra or Mathematics D is prerequisite to Psychology 5, and that Physiology 1A, 1C are not open to freshmen. For students who have had a course elsewhere related but not strictly equivalent to Psychology 1B, an examination (without credit) will be required before admission to the major.

Psychology 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: A sequence of courses which must include courses 106A, 107, to be taken not later than the junior year, and 12 other units of upper division courses in psychology. At least 9 of these 12 units must be taken

∇ Absent on war leave, 1946-1947.

² In residence spring semester only, 1946-1947.

after the completion of 106A and 107, except in the case of honor students. The remaining 6 units may be chosen in whole or in part from upper division courses in psychology or, subject to approval, from the following: Agricultural Economics 113; Anatomy 102, 103; Business Administration 153; Economics 106, 150A, 150B, 180; Education 110, 113, 116; Home Economics 132, 133; Political Science 181, 183; Social Welfare 105, 106; Zoölogy 114; any upper division course in anthropology, philosophy, physiology, or social institutions. Attention of the student is directed to prerequisites for courses which may be elected in the major program.

For students intending to take the sequence of clinical courses the order is 160 (I) and 162 (II) as juniors, and 163 (I) and 164 (II) as seniors.

In planning a major in psychology the student should note that two years of work are required in the upper division. Unless all the preparatory courses have been completed in the lower division more than two years 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 instructor in charge of the student's 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. 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 more detailed treatment of important problems. Intended primarily for prospective major students.
2. Survey of Psychology. (3) I and II. _____
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 Psychological Measurements. (3) I and II.

Mr. JARRETT and Teaching Assistants

Three lectures, and one section meeting.

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, 128, 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. W. BROWN, Mr. BRUNSWIK, and Teaching Assistant

I (W. Brown); II (Brunswik).

Lectures and laboratory. Fee, \$3.50.

A survey with performance of typical experiments on reaction tendencies, skill, perception, learning and problem solving.

*106B. Experimental Psychology. (3) II.

Mr. W. BROWN and Teaching Assistant

Lectures and four hours laboratory to be arranged. Fee, \$3.50.

Individual laboratory problems.

107. Advanced Psychological Measurements. (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. Fee, \$1.50.

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.

108A. Physiological Psychology. (3) I.

Mr. JARRETT

Lectures and laboratory. Fee, \$3.50. Enrollment limited to 20 students.

Prerequisite: Physiology 1A or consent of instructor.

*108B. Physiological Psychology. (3) II.

Fee, \$3.50.

* Not to be given, 1946-1947.

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.
(In 1946-1947 Home Economics 132 will be accepted as a substitute for Psychology 112.)
113. Adolescence. (2) II. Mr. JONES
A survey of current research, with particular reference to the analysis and interpretation of data from growth studies. Individual projects and reports.
- *114. Laboratory in Child Study. (1) I. Mr. JONES
Hours to be arranged, one day a week. Prerequisite: consent of instructor.
Experience is given in specific observational and test procedures and in the collection and assembly of records for individual studies of young children. Offered to a limited group of students also enrolled in course 112.
115. Laboratory in Adolescent Development. (1) II. Mr. JONES
Three hours to be arranged. Prerequisite: consent of instructor.
Offered to a limited number of students also enrolled in course 113.
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. Miss BAYLEY
Laboratory work at the Institute of Child Welfare, accompanying course 116. Admission only by permission of the instructor.
120. History of Psychology. (3) II. Mr. BRUNSWIK
Prerequisite: 6 upper division units in psychology, or 8 upper division units in psychology and philosophy. Primarily for seniors and graduates.
The major problems of modern psychology—perception, thinking, emotion, behavior, personality, physiological psychology, methods of psychology—will be traced from their beginnings to the present time.
126. Contemporary Psychology. (3) II. 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.

* Not to be given, 1946-1947.

- *128. Schools and Theory in Modern Psychology. (3) II. Mr. BRUNSWIK
Prerequisite: 6 upper division units in psychology, or 8 upper division units in psychology and philosophy.
Structuralism, functionalism, gestalt psychology, behaviorism, psychoanalysis. Lectures, readings, and discussion of the literature in the field of modern psychological theory.
- *131. Perception. (3) II. Mr. BRUNSWIK
134. Psychology of Motivation. (3) I. Mr. TOLMAN
The nature of primary and secondary drives; the theories concerning drives found in animal, child, experimental, social and abnormal psychology, and in philosophy.
- 145A. Social Psychology. (3) I. Mr. TRYON
- 145B. Social Psychology. (3) II. Mr. TRYON
Consideration of special problems in social psychology. Individual projects and reports; lectures and discussions.
146. Differential Psychology. (3) II. Mr. TRYON
The origin and nature of psychological differences between individuals.
148. Personality. (3) I. Mr. SANFORD
Prerequisite: Psychology 162 or 168 and senior or graduate standing.
149. Dynamic Psychology. (3) II. Mr. SANFORD
Prerequisite: senior or graduate standing and permission of the instructor.
- 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 the consent of the instructor. Fee, \$3.50.
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) II. Mrs. MACFARLANE, Mrs. GULLBERG
Prerequisite: course 5, or equivalent, and 160, or 112, or Home Economics 134.
Behavior of normal children. Dynamics of personality development.
163. Clinical Techniques. (3) I and II. Mr. SHERRIFFS
Lecture and laboratory; four hours field work to be arranged.
Prerequisite: courses 1B, 5, 160, 162, and consent of instructor.
Consideration of outstanding types of clinical device for measurement, interview and observation.

* Not to be given, 1946-1947.

164. Advanced Clinical Psychology. (3) I and II.
Lecture and laboratory. Mrs. MACFARLANE, Mrs. GULLBERG
Prerequisite: courses 162, 163 and consent of instructor. Fee, \$4.50.
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 psychoneuroses 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: Psychology 1A or 3.
A consideration of the application of psychological techniques and principles derived from controlled observation to the study of problems in advertising, selling, and market research. Field work.
185. Personnel and Industrial Psychology. (3) I and II. Mr. GHISELLI
Prerequisite: Psychology 1A or 3.
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: Psychology 162 or 185 and the permission of the instructor. For seniors and graduates. Fee, \$3.50.
Principles of occupational counseling, nature and sources of occupational information, evaluation and use of standard occupational tests.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The STAFF (Mr. SANFORD in charge)
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

Concerning conditions for admission to graduate courses, see page 146. In addition, permission of the instructor in charge must be obtained and a comprehensive examination must be passed before enrollment.

213. Research. (1-6) I and II.
The STAFF (Mr. TRYON in charge, fall semester;
Mr. TOLMAN in charge, spring semester)
Hours by arrangement.
Laboratory, library, or field work as the problem requires.
214. Seminar. (No credit) I and II.
The STAFF (Mr. W. BROWN in charge fall semester;
Mr. BRUNSWIK in charge, spring semester)
Conferences for the presentation and discussion of methods and results of investigations in progress. In addition to the general session, the seminar meets in sections, depending upon students' requirements.
- 214A. Abnormal Psychology. (2) I and II. Miss BRIDGMAN, Mr. HARRIS
- 214B. Physiological Psychology. (2) I and II. Mr. C. W. BROWN

* Not to be given, 1946-1947.

- 214C. Experimental Psychology. (2) I and II. Mr. W. BROWN
- 214D. Systems and Methodology in Psychological Research. (2) I and II.
Mr. W. BROWN, Mr. BRUNSWIK
- 214E. Developmental Psychology. (2) II. Mr. JONES
- 214F. Clinical Psychology. (2) I and II. Mrs. MACFARLANE
- 214G. Animal Psychology. (2) I and II. Mr. TOLMAN
- 214H. Individual Differences. (2) I and II. Mr. TRYON
- 214K. Applied and Industrial Psychology. (2) I and II. Mr. GHISELLI
- 214L. Psychology of Personality. (2) I and II. Mr. SANFORD
- 214M. Social Psychology. (2) I and II. Mr. TRYON, Mr. W. BROWN

PUBLIC HEALTH

- 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.
 W. McDOWELL HAMMON, M.D., Dr.P.H., Associate Professor of Epidemiology (Chairman of the Department of Public Health).
 WALTER S. MANGOLD, B.S., Associate Professor of Sanitary Practice.
 DOROTHY D. HELM, B.S., Associate in Public Health.
 MARGERY MAGGS, A.B., Associate in Public Health.
 FLORENCE M. QUIST, A.B., Associate in Public Health.

- DWIGHT M. BISSELL, M.D., M.S.P.H., Lecturer in Public Health.
 RICHARD A. BOLT, M.D., Dr.P.H., Lecturer in Public Health.
 PETER COHEN, M.D., Lecturer in Public Health, for the spring semester.
 HAROLD F. GRAY, M.S., Gr.P.H., Lecturer in Public Health.
 NELL HOLLINGER, Ph.D., Lecturer in Public Health.
 FRANK L. KELLY, M.S., M.D., Dr.P.H., Lecturer in Public Health.
 EDITH LINDSAY, M.A., Ed.D., Lecturer in Public Health.
 JAMES H. SKILLIN, M.S., C.P.H., Lecturer in Public Health.

Letters and Science List.—Courses 5A–5B, 21, 163A–163B, are included in the Letters and Science List of Courses. For the regulations governing this list, see page 81.

Laboratory Fees.—The laboratory fee for courses 164A, 164B, 147A, and 147B is \$3.50 each; for 151, \$34.50; for 152, \$11.50.

LOWER DIVISION COURSES

- 5A–5B. Elementary Public Health. (3–3) Yr. Mr. BOLT, ———
 Lectures, three hours.
 Course 5A is prerequisite to 5B.
 A survey of the 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, with special emphasis on administrative programs of federal, state, and local health agencies.
11. Microbiology Applied to Environmental Sanitation. (1) II. Mr. MANGOLD
 (Formerly Bacteriology 5.)
 Lectures and field trips.
16. Elementary Public Health Statistics and Epidemiology for Sanitarians.
 (2) II. _____
 Lectures, one hour; laboratory, three hours.
 Enrollment limited to students in the Special Program for Sanitarians.
 The completion and analysis of data, rates and their correction, population studies, and the history and study of epidemics.
21. Informational Hygiene. (2) I. Miss LINDSAY
 (Formerly numbered 2.)
 Enrollment limited to students in the lower division.
 A consideration of physical, mental, and social well-being of the individual.

UPPER DIVISION COURSES

105. Public Health Administration. (3) II. Mr. KELLY
Prerequisite: Public Health 5A-5B, or consent of the instructor. Required of all candidates for the certificate in public health nursing.
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.) _____
111. Environmental Sanitation. (2) I. Mr. GRAY
Problems of housing, heating, ventilation, lighting, water supply, waste disposal, insect and rodent control, and control of milk and other food supplies.
112. Introduction to Industrial Hygiene. (2) I. _____
(Formerly numbered 110.)
The scope, organization, and operation of industrial health services.
Designed as an introduction to the field of industrial hygiene with a discussion of the organization, scope, and activities.
- 113A. Principles and Practices in Sanitary Inspection. (3) I. Mr. MANGOLD, Mr. SKILLIN
Lectures, two hours; laboratory or field trips, three hours.
Objective and special techniques in general sanitation covering communicable disease control, water and sewage, housing, ventilation, lighting, and vector control.
- 113B. Principles and Practices in Sanitary Inspection. (3) II. Mr. MANGOLD, Mr. SKILLIN
Lectures, two hours; laboratory or field trips, three hours.
Objectives and special techniques in food sanitation covering milk, meat, markets, restaurants, and processing plants.
121. Child Hygiene. (3) II. Mr. COHEN
(Formerly numbered 102.)
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.
122. Individual Hygiene. (4) II. Mr. BOLT
(Formerly numbered 112.)
The maintenance of optimal physical, mental, and nutritional status; the prevention and control of common deficiencies and abnormalities such as those related to nutrition, digestion, circulation, the central nervous system, vision, hearing, speech, and body mechanics.
145. Community Control of the Communicable Diseases. (3) I. Mr. BISSELL
(Formerly numbered 115.)
Lectures, three hours.
The epidemiology and community control of communicable disease, including tuberculosis and the venereal infections. Required of all candidates for the certificate in public health nursing.

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

- 147A. Epidemiology. (3) II. _____
 (Formerly numbered 107A.)
 Lectures, one hour; laboratory, six hours. Fee, \$3.50.
 Prerequisites: Public Health 164A and Bacteriology 101, or permission of instructor.
 Methods of collection and analysis of morbidity data; principles of epidemiological investigation.
- 147B. Epidemiology. (4) I. _____
 (Formerly numbered 107B.)
 Lectures, two hours; laboratory, six hours. Fee, \$3.50.
 Prerequisite: Public Health 147A.
 A study of the mass action of disease in the population, and the factors which determine its distribution.
- †148. Advanced Problems in Epidemiology. (1-5) I and II. Mr. HAMMON
 (Formerly numbered 197.)
 Prerequisite: course 147B, or permission of the instructor.
151. Public Health Laboratory Techniques. (8) II.
 (Formerly numbered 108.) Miss BEATTIE, Miss QUIST, Miss MAGGS
 Lectures, three hours; laboratory, fifteen hours. Fee, \$34.50.
 Prerequisite: Bacteriology 101, and consent of the instructor.
 Enrollment limited to forty students. Laboratory diagnosis of communicable diseases.
152. Laboratory Procedure in Hematology. (3) I.
 (Formerly numbered 118.) Miss HOLLINGER, Miss QUIST, Miss MAGGS
 Lecture, one hour; laboratory, six hours. Fee, \$11.50.
 Prerequisites: Biochemistry or advanced Bacteriology.
 Designed to present the elements of hematology and technique useful in diagnostic laboratories.
153. Laboratory in Sanitary Practice. (4) I. Mr. SKILLIN
 Lectures, two hours; laboratory, six hours.
 Prerequisite: Bacteriology 101. Primarily for students in the Public Health Sanitarian curriculum, but open to others by permission of the instructor.
 Laboratory and field work with equipment and techniques useful to the sanitarian in his application of the principles of sanitary practice. Lectures and demonstrations covering processes and procedures encountered in various types of inspectional service.
154. Public Health Laboratory Procedures. (2) II. _____
 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.
- †158. Advanced Problems in Public Health Laboratory. (1-5) I and II.
 (Formerly numbered 193.) Miss BEATTIE
 Prerequisites: Public Health 151, and the consent of the instructor.
 Special investigations of public health laboratory problems.

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

- 163A. Biometry. (2) I and II. _____
 (Formerly numbered 103A.)
 Lectures, two hours.
 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.
- 163B. Biometry. (2) II. _____
 (Formerly numbered 103B.)
 Lectures, two hours.
 Prerequisite: Public Health 163A, or permission of the instructor.
 Consideration of the theories of sampling and measures of relationship as applied in the fields of public health, biology, and medicine.
- 163C. Biometry. (2) I. _____
 (Formerly numbered 103C.)
 Lectures, two hours.
 Prerequisite: Public Health 163B, or permission of the instructor.
 Consideration of the theories of small samples as applied in the fields of public health, biology, and medicine.
- 164A. Public Health Statistics. (3) I. _____
 (Formerly numbered 104A.)
 Lectures, one hour; laboratory, six hours. Fee, \$3.50.
 Open only to students who have completed Public Health 5A-5B, or who have the consent of the instructor.
 An introduction to the collection, tabulation, and use of population data and vital statistics.
- 164B. Demography. (4) II. _____
 (Formerly numbered 104B.)
 Lectures, two hours; laboratory, three hours. Fee, \$3.50.
 Prerequisite: course 164A, or consent of the instructor.
 Statistical study and quantitative description of the population of a community based on data collected by enumeration, registration, and survey.
- †168. Advanced Problems in Biometry. (1-5) I and II. _____
 (Formerly numbered 194.)
 Prerequisite: course 163B.
- †169. Advanced Problems in Public Health Statistics and Demography. _____
 (1-5) I and II. (Formerly numbered 195.)
 Prerequisite: course 164B.
198. Directed Group Study. (1-5) I and II.
 The STAFF (Mr. HAMMON in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The STAFF (Mr. HAMMON in charge)

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

GRADUATE COURSES

201. Public Health Organizations and Programs. (2) I. _____
(Formerly numbered 215.)
Lectures, two hours.
History of public health; governmental and voluntary agencies and their activities; legal basis of public health administration; public health administration; public health personnel, their training and duties.
202. Public Health Administration. (4) II. _____
Prerequisite: course 105 or 201.
Technical bases of public health administration. Systematic consideration of administrative policies in public health. Each student will be obliged to present a project of his own choosing and acceptable to the instructor.
211. Sanitation. (3) I. _____ **Mr. GRAY**
Study of water supply and treatment, sewerage and sewage treatment, wastes collection and disposal, meat, milk and other food sanitation, housing, industrial sanitation, insect and rodent control, and related subjects.
231. School Health Education. (3) I. _____
(Formerly numbered 210.)
Lectures, three hours.
The planning, development, operation, and evaluation of the school health education program, based upon a consideration of the health problems, the health services, the physical education program, the curriculum and the personnel of the school; study and practice in working with individual teachers and children.
232. Public Health Education. (3) II. _____
(Formerly numbered 211.)
Lectures, three hours.
Community organization as it is related to health education and adult education; the motivation of individuals and groups; conference techniques; group planning; evaluation and development of health education activities using source materials and the techniques of press, radio, public meetings, correspondence, printed matter, visual material, and special campaigns; health education aspects of personnel training.
241. Biology of Infectious Diseases (Epidemiology). (3) I. **Mr. HAMMON**
Lectures and discussion total 48 hours per semester; one two-hour period and one one-hour period per week. Prerequisite: an adequate knowledge of infectious diseases. To be taken concurrently with course 251.
Discussion of parasite, vector, reservoir host, and environment in relation to survival or interruption of the infection chain.
242. Applied Epidemiology. (2) II. _____ **Mr. HAMMON**
Lectures: one hour per week; laboratory, three hours per week.
Prerequisite: courses 241, 251, 261.
Methods used in collection of data, their analysis, interpretation, and reporting. Study of type epidemics.

251. Functions of the Public Health Laboratory. (1) I. Miss BEATTIE
Lecture and demonstration, sixteen sessions of one hour each. To be taken concurrently with course 241.
Use of the public health laboratory; laboratory methods, collection and submission of suitable specimens, interpretation of results, special research problems in diagnosis.
261. Public Health Statistics and Biometry. (4) I. _____
Primarily for students in the Health Administrators' curriculum, but open to others by permission of the instructor.
Procedures of enumeration, registration, survey, and demographic investigation which are of importance to public health officers. Technics of biometric analysis useful in elucidating laboratory and field studies and of particular value in epidemiological investigation will be presented and demonstrated.
262. Advanced Public Health Statistics. (3) I and II. _____
Lecture, one hour; laboratory, six hours.
Prerequisite: courses 163A, 164.
Procedures and practices of administrative statistics.
- †290. Seminar in Public Health Administration. (2 or 4) I and II. _____
Specific problems dealing with organization and planning of public health activities will be assigned.
- †293. Seminar in Health Education. (2-4) II. _____
- †294A. Seminar in Epidemiology. (4) II. Mr. HAMMON
Prerequisite: course 242.
Primarily for students in Health Administrators' curriculum.
- †294B. Seminar in Epidemiology. (2) I. _____
Primarily for students not in Health Administrators' curriculum.
Prerequisite: courses 147B, 163B, 164B.
- †295. Seminar in Public Health Laboratory Practice. (2-4) I and II. Miss BEATTIE
- †296. Seminar in Biostatistics. (2-4) II. _____
Prerequisite: courses 163B, 164B.
299. Special Study for Graduate Students. (2-4) I and II.
(Formerly numbered 201.) The STAFF (Mr. HAMMON in charge)

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

PUBLIC SPEAKING

- C. DOUGLAS CHRÉTIEN, Ph.D., Associate Professor of Public Speaking.
 GERALD E. MARSH, M.A., Associate Professor of Public Speaking (Chairman of the Department).
 ARNOLD PERSTEIN, Ph.M., Associate Professor of Public Speaking.
 EDWARD Z. ROWELL, Ph.D., Associate Professor of Public Speaking.
 ALAN R. THOMPSON, Ph.D., Associate Professor of Dramatic Literature and Public Speaking.
 DWIGHT E. WATKINS, M.S., Associate Professor of Public Speaking.
 EDWARD N. BARNHART, Ph.D., Assistant Professor of Public Speaking.
 WILLIAM B. MCCOARD, Ph.D., Assistant Professor of Public Speaking.
 DAVID RYNIN, Ph.D., Assistant Professor of Public Speaking.
 JACOBUS TEN BROEK, J.S.D., Assistant Professor of Public Speaking.
 GARFF B. WILSON, Ph.D., Assistant Professor of Public Speaking.
 KARL ASCHENBRENNER, Ph.D., Instructor in Public Speaking.
 FREDERIC L. DARLEY, M.A., Instructor in Public Speaking.
 WARD E. TABLER, A.B., Associate in Public Speaking.
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- ELIZABETH F. RUSSELL, Ph.D., Lecturer in Public Speaking.
 FRED STRIPP, M.A., B.D., Lecturer in Public Speaking.
 JOE TUSSMAN, M.A., Lecturer in Public Speaking.

Students must have passed Subject A before taking any course in public speaking.

The courses in public speaking fall into two well-defined groups:

(a) *Oral Expression*. In this group come such courses as those in voice culture and oral interpretation of literature.

(b) *Logical Discourse—Expository and Argumentative*. Under this heading are grouped the courses covering the logical and rhetorical bases of those forms of discourse that are primarily addressed to the intellect. The field covered includes study of methods of investigation, analysis, briefing, the testing of evidence, and practice in oral presentation.

Generally speaking, students may choose courses in either group, or in both, but those students who elect public speaking 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 public speaking are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Adviser: Mr. ROWELL.

Preparation for the Major.—Students who wish to make public speaking their major subject must have completed, with an average grade of C or better,

Public Speaking 1A-1B and 2A-2B. It is recommended that Philosophy 6A-6B be taken concurrently with Public Speaking 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 Public Speaking. (3-3) Yr. Beginning each semester.

Mr. ASCHENBRENNER, Mr. BARNHART, Mr. CHRÉTIEN, Mr. DARLEY,
Mr. MARSH, Mr. PERSTEIN, Mr. ROWELL, Mr. RYNIN, Mr. TEN
BROEK, Mr. TABLER, Mr. THOMPSON.

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. DARLEY, Mr. MCCOARD, Mr. WATKINS, Mr. WILSON

10. Logic of Argument. (3) II.

Mr. RYNIN

An examination of the nature and validity of evidence, especially from the point of view of 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 speech and political propaganda.

25. Oral English for Foreign Students. (4) I and II.

Mrs. RUSSELL

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.

Mrs. RUSSELL

Continuation of and required for those who take course 25.

UPPER DIVISION COURSES

107A-107B. Argumentative Discourse: Oral and Written. (3-3) Yr.

Mr. PERSTEIN, Mr. ROWELL, Mr. CHRÉTIEN

Beginning each semester. Prerequisite: course 1A-1B.

107A. I, two sections. II, one section. 107B. I, one section. II, two sections.

110A-110B. Oral Argumentation and Debate. (3-3) Yr.

Mr. MARSH

Prerequisite: courses 1A-1B, 2A-2B, and 107A-107B.

111A-111B. The Reading of Prose and Poetry. (3-3) Yr.

Mr. MCCOARD, Mr. WATKINS, Mr. WILSON

Prerequisite: course 2A-2B.

(a) The essay and the short story. (b) The ballad, the lyric, the ode, etc.

111A. I, two sections. II, one section. 111B. I, one section. II, two sections.

117. Semantics. (3) I. Mr. RYNIN
A basic analysis of the nature and functions of language with special emphasis on the problem of meaning as it relates to science, art, morals, politics, and religion.
- *118. Symbolism: A Study of the Expressive Functioning of Signs. (3) II. Mr. BARNHART
The nature of symbols and signs, and their function in human experience, with emphasis on their expressive role in poetry and speech.
Prerequisite: Public Speaking 1A-1B, 12.
120. The Use of the Library. (3) II. Mr. ROWELL
Practical exercises in the use of the more important library tools; the card catalogue, the unabridged dictionaries, encyclopedias, general and special yearbooks, general atlases, chronologies, aids to the choice of books, special bibliographies, etc.
- *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. (2) II. Mr. TEN BROEK
Critical analysis of speeches of Wilson, Roosevelt, Churchill and other leaders from 1914 to the present time.
152. Debate. (2) I and II. Mr. TEN BROEK
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, Mr. TEN BROEK
199. Special Study for Advanced Undergraduates. (1-5) I and II. The STAFF (Mr. MARSH in charge)

* Not to be given, 1946-1947.

ROMANCE PHILOLOGY

HERBERT H. VAUGHAN, Ph.D., Professor of Italian.

CHARLES E. KANY, Ph.D., Professor of Spanish.

FRANCIS J. CARMODY, 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.

†201. Vulgar Latin. (2) II. Mr. VAUGHAN

202. General Romance Linguistics. (2) I. Mr. VAUGHAN

†203. Old Provençal. (2) I. Mr. KANY

†204A–204B. Comparative Romance Phonetics. (1–1) Yr. Mr. CARMODY

Hours to be arranged.

Prerequisite: Romance Philology 202.

Special attention will be paid to the Western Romance Group.

Historical French Grammar (see French 201A–201B).

Italian Philology and Dialects (see Italian 201A–201B).

Old Spanish (see Spanish 212A–212B).

 SANSKRIT

Undergraduate and graduate courses in Sanskrit, Indo-European comparative philology, and general linguistics, with information concerning the undergraduate major in these subjects, will be found in the ANNOUNCEMENT OF THE DEPARTMENT OF CLASSICS.

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

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 81.

LOWER DIVISION COURSES

- 1A-1B. Elementary Swedish. (3-3) Yr. Mr. JANZÉN
(A) Swedish grammar, composition, reading.
(B) Advanced composition, conversation, and reading of selected novels and plays.
- 3A-3B. Elementary Norwegian. (3-3) Yr. Mr. JANZÉN
(A) Norwegian grammar, composition, reading.
(B) Advanced composition, conversation, reading of selected novels, plays, and lyrics.

UPPER DIVISION COURSE

- 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.

SLAVIC LANGUAGES

WACLAW LEDNICKI, Ph.D., Professor of Slavic Languages.

GEORGE R. NOYES, Ph.D., LL.D., Litt. D., Professor of Slavic Languages, Emeritus.

OLEG A. MASLENIKOV, Ph.D., Assistant Professor of Russian (Chairman of the Department).

GEORGE C. GUINS, M.L., Lecturer in Russian.

LUDMILA A. PATRICK, M.A., Lecturer in Russian.

GLEB STRUVE, A.B., Lecturer in Russian.

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 81.

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; 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.

Mr. MASLENIKOV in charge

Two lectures and three recitation hours weekly.

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.

- *6A-6B. Elementary Polish. (3-3) Yr.

Mr. LEDNICKI

- 10A-10B. Elementary Serbo-Croatian. (3-3) Yr.

- *14A-14B. Elementary Bohemian. (3-3) Yr.

Mr. MASLENIKOV

- 18A-18B. Elementary Russian Conversation. (2-2) Yr. Beginning each semester.

Mr. GUINS in charge

Open only to students who also are taking course 1 or 2.

* Not to be given, 1946-1947.

UPPER DIVISION COURSES

A. Language Courses

- 102A-102B. Second-year Russian. (3-3) Yr. Mr. MASLENIKOV, Mr. GUINS
- 103A-103B. Third-year Russian. (3-3) Yr. 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. ———
- *115A-115B. Second-year Bohemian. (3-3) Yr. Mr. MASLENIKOV
- †116A-116B. Third-year Bohemian. (3-3) Yr. Mr. MASLENIKOV
- 119A-119B. Intermediate Russian Conversation. (2-2) Yr. Mr. STRUVE
- 120A-120B. Advanced Russian Conversation and Composition. (2-2) Yr.
Mrs. PATRICK
121. The Russian Language. (2) I.
Its structure, etymology, and syntax.
Prerequisite for all Slavic Languages majors. Mr. MASLENIKOV
122. The Pronunciation of Russian. (2) II.
Phonetics and accentuation. Mr. MASLENIKOV
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)

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. Russian Literature of the Nineteenth Century. (3) I. Mr. LEDNICKI
Pushkin, Lermontov, Gogol, Turgenev, Dostoyevski, Tolstoy, and others.
131. Recent Russian Literature (1880-1917). (2) II. Mr. STRUVE
Garshin, Chekhov, Gorki, Andreyev, Bunin, Kuprin, Korolenko, the Symbolists, and others.

* Not to be given, 1946-1947.

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

132. Russian Literature Since 1917. (2) I. Mr. STRUVE
Alexey Tolstoy, Gladkov, Fadeyev, Fedin, Leonov, Sholokhov, Simonov,
Aldanov, Nabokov, and others.
133. Tolstoy and Dostoyevski. (3) II. Mr. LEDNICKI
134. Russian Literature and Folklore. (2) II. Mrs. PATRICK
Development of the literature, exclusive of the novelists and general
features of the folklore.
138. Modern Russia. (2) II. Mr. STRUVE
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.
- *160. Survey of Czech and Slovak Literature. (2) II. _____
The development of Czech and Slovak literature from the sixteenth cen-
tury to the present.
- *170. Survey of South Slavic Literature. (2) II. _____
180. Survey of Russian Culture. (2) I. Mr. STRUVE
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) II. The STAFF (Mr. LEDNICKI in charge)

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

Language Courses

224. Old Church Slavic. (3) II. Mr. MASLENIKOV
Relation to other Indo-European languages. The textbook for this course
is in German.
- †225. Old Church Slavic and Early Russian. (3) 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
- †227. Early Russian Literature. (2) II. Mr. MASLENIKOV
240. Pushkin. (2) I. Mr. LEDNICKI

* Not to be given, 1946-1947.

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

*245. Studies in the Russian Novel. (2) I.

Mr. LEDNICKI

*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, 1946-1947.

SOCIAL WELFARE

MILTON CHERNIN, Ph.D., Associate Professor of Social Welfare (Chairman of the Department).

MARTIN B. LOEB, A.B., Assistant Professor of Social Welfare.

² MAURINE McKEANY, M.A., Assistant Professor of Social Welfare and Supervisor of Field Work.

PEARL AXELROD, M.A. (Lecturer in Psychiatric Social Work in the Medical School), Lecturer in Social Welfare.

¹ LESLIE L. BENNETT, M.D., Ph.D. (Assistant Professor of Physiology), Lecturer in Social Welfare.

¹ DOUGLAS G. CAMPBELL, M.D. (Assistant Clinical Professor of Psychiatry in the Medical School), Lecturer in Social Welfare.

PETER COHEN, M.D. (Lecturer in Pediatrics and Lecturer in Public Health), Lecturer in Social Welfare.

RUTH COOPER, M.A., Lecturer in Social Welfare.

² ERIK H. ERIKSON, Lecturer in Social Welfare.

HAZEL H. FREDERICKSEN, M.A., Lecturer in Social Welfare.

WALTER FRIEDLANDER, Ph.D., Lecturer in Social Welfare.

² JOSEPHINE R. HILGARD, M.D., Ph.D., Lecturer in Social Welfare (for the spring semester).

¹ ANNA MAENCHEN, Ph.D., Lecturer in Social Welfare.

² HASSELTINE BYRD TAYLOR, J.D., Ph.D., Lecturer in Social Welfare.

WAYNE VASEY, M.A., Lecturer in Social Welfare (for the fall semester).

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 80.

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 81.

UPPER DIVISION COURSES

100. The Field of Social Welfare. (3) I.

Mr. LOEB

A survey of the field of social welfare and of 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.

¹ In residence fall semester only, 1946–1947.

² In residence spring semester only, 1946–1947.

- 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
 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. Mr. BENNETT
 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
 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
 110A. I; 110B. I and II.
 110A is prerequisite to 110B.
 NOTE.—110B will be given in two sections in the spring semester.
 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 and II.
 I (Friedlander); II (McKeany). Mr. FRIEDLANDER, Miss McKEANY
 Designed primarily for graduate students who have not completed the group major in social welfare. Not available to those who have completed Social Welfare 110A-110B.

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. AXELROD
 Introduction to the study and practice of social case work.
203. Community Organization. (2) 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. Mrs. TAYLOR
 NOTE.—251A will be given in the spring semester only.
 251A. The problem of relief for the needy. Poor law policy and practice. The categorical aids, problems of policy and administration.
 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. Mr. VASEY
 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
 NOTE.—253B will also be given in the fall semester.
 253A. A general survey of the field with particular reference to the development of special measures for the care and protection of dependent and neglected children. The organization and functions of public and private child welfare services.
 253B. The application of case work concepts to child welfare work. Methods and policies of foster family and institutional care. Problems in the treatment of socially handicapped children. Designed primarily for students whose special field is child welfare.
- 254A-254B. Medical Social Work. (2-2) Yr. Miss COOPER
 254A. The social component of illness. Social case work in the medical setting.
 254B. The development, organization, and administration of medical social service functions in institutional and extramural settings.
- 255A-255B. The Medical Services. (2-2) Yr. Mr. COHEN, Miss COOPER
 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.

* Not to be given, 1946-1947.

- 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
262. Psychiatry and Social Work. (2) II. Mrs. HILGARD
 The diagnosis and treatment of the psychoneuroses, neuroses, psychoses, and mental deficiencies, and their social implications. The various schools of psychiatric thought. An advanced course particularly for students specializing in psychiatric social work.
263. Psychiatric Social Work. (2) I. 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. FREDERICKSON
 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. The mental hygiene movement.
265. Social Welfare Research. (2) I and II. Mr. LOEB, Mr. CHERNIN
 I: (Loeb); II: (Chernin).
 A seminar in research methods and social statistics, designed particularly to assist students with thesis problems.
- 266A-266B. Emotional Development of Children. (2-2) Yr. Mrs. MAENCHEN, Mr. ERIKSON
 266A (Maenchen). Dynamics of childhood behavior in conflicting situations. The contribution of psychoanalytic theory to social case work with children.
 266B (Erikson). Child development and family structure. The dynamics of the relationship between the social and cultural determinates of personality.
 266A is not prerequisite to 266B.
 266B is limited to students specializing in psychiatric social work.
291. International Social Services. (2) II. Mr. FRIEDLANDER
 (Formerly numbered 298c.)
 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. FRIEDLANDER and Mr. LOEB in charge)
 Individual or group study, with emphasis on original research, as may be arranged.
299. Special Research. (2) I and II. The STAFF (Mr. FRIEDLANDER in charge)

401. Field Work. (2-10) I and II.

The STAFF (Mrs. AXELROD in charge, fall semester ;
Miss MCKEANY in charge, spring semester)

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 credits are 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

- FREDERICK J. TEGGART, A.B., LL.D., Professor of Social Institutions, Emeritus.
 EDWARD STRONG, Ph.D., Associate Professor of Philosophy (Chairman of the Department of Sociology and Social Institutions).
 †MARGARET T. HODGEN, Ph.D., Associate Professor of Social Institutions.
 GEORGE H. HILDEBRAND, JR., Ph.D., Assistant Professor of Social Institutions.
 ROBERT A. NISBET, Ph.D., Assistant Professor of 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 81.

Departmental Major Adviser: Mr. HILDEBRAND.

Preparation for the Major.—Social Institutions 1A-1B, Philosophy 10A-10B. Recommended: Anthropology 1A-1B, Economics 1A-1B, Paleontology 1, Psychology 1A, Zoölogy 10.

The Major.—Social Institutions 101A-101B (6), 131A-131B (6), 141 (3), 142 (3), 151A-151B (6).

LOWER DIVISION COURSES

- 1A-1B. Progress and Civilization. (3-3) Yr. Mr. HILDEBRAND
 An introduction to social thought; the role of the idea of progress in the social sciences.
 5A-5B. The History of Civilization. (3-3) Yr. Mr. NISBET
 Laboratory.

UPPER DIVISION COURSES

- *101A-101B. Social Evolution. (3-3) Yr. Miss HODGEN
 Theories of social progress including the geographical, racial, and economic; analysis of methodological problems in the investigation of social change.
 121A-121B. Sociological Theory. (2-2) Yr. Mr. NISBET
 (A) Critical examination of major concepts, such as the group, community, personality, social process.
 (B) The historical relation between sociology and the natural and social sciences; contemporary schools and theories.
 131A-131B. History of Social Institutions. (3-3) Yr. Mr. HILDEBRAND
 Nine hours of laboratory weekly.
 Subjects: the family, state, property, and other institutional forms.
 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.

† Absent on leave, 1946-1947.

* Not to be given, 1946-1947.

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 kinship groups; emphasis on the problem of disorganization.
- *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.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The STAFF (Mr. HILDEBRAND in charge)

GRADUATE COURSES

- 201A-201B. Seminar in Social Institutions. (2-2) Yr. Mr. HILDEBRAND
- *221A-221B. Seminar in Social Institutions. (2-2) Yr. Miss HODGEN
- 241A-241B. Seminar in Social Institutions. (2-2) Yr. Mr. NISBET
298. Special Study and Research. (1-5) I and II. Mr. NISBET

COURSES IN OTHER DEPARTMENTS

- Chapters in Culture History. (Anthropology 102.)
- Nature of Culture. (Anthropology 118A-118B.)
- History of Economic Doctrine. (Economics 101A-101B.)
- Social Reform Movements. (Economics 106.)
- Ethics. (Philosophy 104.)
- Social Philosophy. (Philosophy 108.)
- Philosophy of Religion. (Philosophy 112.)
- Theory of the State. (Political Science 111.)
- Social Psychology. (Psychology 145A-145B.)

* Not to be given, 1946-1947.

SPANISH AND PORTUGUESE

* ERASMO BUCETA, Doctor en Derecho, Professor of Spanish.

CHARLES E. KANY, Ph.D., Professor of Spanish.

† S. GRISWOLD MORLEY, Ph.D., Litt.D., Professor of Spanish (Chairman of the Department).

LESLEY B. SIMPSON, Ph.D., Professor of Spanish.

ARTURO TORRES-RIOSECO, Ph.D., Professor of Latin-American Literature.

BEATRICE Q. CORNISH, Ph.D., Assistant Professor of Spanish, Emeritus.

ROBERT K. SPAULDING, Ph.D., Associate Professor of Spanish.

YAKOV MALKIEL, Ph.D., Assistant Professor of Spanish.

EDWIN S. MORBY, Ph.D., Assistant Professor of Spanish.

MARIO CAMARINHA DA SILVA, Licenciado em Letras, Instructor in Portuguese.

MADRE MERRILL, M.A., Associate in Spanish.

FERNANDO A. ALEGRIA, M.A., Lecturer in Spanish.

ARNOLD CHAPMAN, M.A., Lecturer in Spanish.

JOSÉ F. MONTESINOS, Licenciado en Filosofía y Letras, Lecturer in Spanish.

DOROTHY C. SHADI, Ph.D., 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 81.

Departmental Major Adviser: Mr. R. K. SPAULDING.

Preparation for the Major.—Spanish 1, 2, 3, 4 (with a grade of A or B), or four years of high school Spanish and 25A–25B, or other equivalent to be tested by examination. If course 4 is passed with grade lower than B, the student must complete 25A–25B as prerequisite to upper division courses.

Students who wish to make Spanish their major subject must have maintained at least an average grade of C in the college courses in Spanish taken prior to obtaining the degree of Associate in Arts.

Students who do not enter with a minimum of two years of high school Latin, or its equivalent, must take Latin 1 and 2, before entering upon the senior year.

Only students who pronounce Spanish correctly and read it fluently will be admitted to upper division courses. Students transferring from other institutions may be tested by examination.

The Major.—Required: 24 upper division units. Spanish 101A–101B (may be omitted if 25A–25B has been passed with a grade of A or B), and 107A–107B. The remaining units may be completed from 100A, 100B, 103, 104, 105, 109, 110, 111, 112, 116, and 199 and Portuguese 122, 123A–123B. The department recommends to major students in Spanish the continuation in the upper division of courses in French, Italian, Portuguese, or Latin. A course in Hispanic and Hispanic-American history (History 160A–160B, 161A–161B) is also recommended.

Students who fail to maintain at least an average grade of C in the Spanish

* Absent on leave, 1946–1947.

† In residence fall semester only, 1946–1947.

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 in Spanish.

Honor Students in the Upper Division.—Candidates for honors must do distinguished work in 24 units of upper division courses, as outlined in the major.

Higher Degree.—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

SPANISH

LOWER DIVISION COURSES

(Enrollment limited to thirty students per section)

NOTE.—A student whose native tongue is Spanish will not be admitted to courses 1, 2, 3, 4, 25A–25B. This applies to students who have not received matriculation credit in Spanish as well as to those who have such credit.

1. Elementary Spanish. (4) I and II. Mr. MORBY in charge
Sections meet five hours weekly.
 2. Elementary Spanish (continuation of 1). (4) I and II. Mr. MORBY 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. Miss MERRILL 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. Miss MERRILL 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. SIMPSON in charge
Prerequisite: course 4 or the equivalent.

UPPER DIVISION COURSES

Prerequisite: 16 units of lower division Spanish, including course 4 with a grade of A or B, or course 25A–25B.

- 100A. Introduction to Spanish Linguistics. (2) I. Mr. KANY
- 100B. American-Spanish Divergencies from Standard Castilian. (2) II. Mr. KANY
Course 100A is not prerequisite to 100B.
- 101A–101B. Oral and Written Composition. (3–3) Yr. Beginning each semester. Mr. SPAULDING in charge
Enrollment limited to 20 in each section.
Prerequisite: 25B, or course 4 with grade of A or B. Sophomores who have had 25A–25B may also be admitted.
Students who have passed 25A–25B with grade of A or B may omit 101A–101B.
- 103A–103B. Nineteenth-Century Literature (1830–1900). (3–3) Yr. Mr. MALKIEL, Mr. TORRES-RIOSECO
Enrollment limited to 30 students in each section.

- 104A-104B. Spanish-American Literature. (3-3) Yr. Beginning each semester.
Mr. TORRES-RIOSECO
- *105A-105B. Modern Drama: From the Romantic Movement to the present.
(2-2) Yr. Mr. BUCETA
- 107A-107B. History of Spanish Literature to 1830. (3-3) Yr. Mr. MORLEY
Prerequisite: at least 10 units of upper division courses.
- *109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries.
(2-2) Yr. Mr. MORLEY
- 110A-110B. The Prose of the Twentieth Century. (2-2) Yr. Mr. MONTESINOS
- 111A-111B. Cervantes. (2-2) Yr. Mr. SIMPSON
112. The Origins of Spanish Culture. (2) II. Mr. MALKIEL
- 116A-116B. Advanced Grammar and Composition. (3-3) Yr. Mr. KANY
Required only of candidates for the Certificate of Completion, teacher-
training curriculum; recommended for all major students. Enrollment
limited to 20.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The STAFF (Mr. MORLEY in charge)

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

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 Cen-
tury. (2-2) Yr. Mr. BUCETA
- 204A-204B. La Novela hispanoamericana. (2-2) Yr. Mr. TORRES-RIOSECO
- *208A-208B. The Ballad. (2-2) Yr. Mr. MORLEY
- *209A-209B. The Drama of the Golden Age. (2-2) Yr. Mr. MORLEY
An intensive study of one author.
- 212A-212B. Old Spanish. (2-2) Yr. Mr. SPAULDING
Reading and historical grammar. Required for candidates for the mas-
ter's degree.
- 213A-213B. The Novel in the Nineteenth Century. (2-2) Yr. Mr. MONTESINOS
- *214A-214B. Modernism in Hispano-America. (2-2) Yr. Mr. TORRES-RIOSECO
(Formerly numbered 210A-210B.)
216. Spanish Versification. (2) I. Mr. MORLEY
- 218A-218B. Pastoral Literature from the Fifteenth to the Seventeenth Century.
(2-2) Yr. Mr. MONTESINOS

* Not to be given, 1946-1947.

225. Pronunciation. (2) I. Mr. KANY
229. Special Advanced Study. (1-2) I and II. Mr. MORLEY in charge
Open to qualified students who wish to take special advanced work.

PORTUGUESE

- 1A-1B. Elementary Portuguese. (3-3) Yr. Beginning each semester.
Mr. CAMARINHA DA SILVA in charge
25. Grammar, Composition, and Reading. (3) I. MR. CAMARINHA DA SILVA
Prerequisite: course 1A-1B.
121. Readings in Portuguese. (3) I. Mr. CAMARINHA DA SILVA
An intensive course for specially qualified beginners. Rapid survey of grammar and pronunciation; readings in prose and verse. Designed especially for advanced students with previous training in Romance languages.
Prerequisite: junior standing and a satisfactory reading knowledge of Latin or one Romance language, or consent of the instructor.
Portuguese 121 or the equivalent is prerequisite to courses 122, 123, 199.
- †122. Portuguese Literature. (3) II. Mr. MALKIEL
Survey of the literature of Portugal, with emphasis on the sixteenth and nineteenth centuries.
- 123A-123B. Brazilian Literature. (3-3) Yr. 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. (1-2) I and II.
Mr. CAMARINHA DA SILVA
229. Special Advanced Study. (1-2) I and II. Mr. MALKIEL in charge

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

SUBJECT A: ENGLISH COMPOSITION

Committee in charge:

JAMES M. CLINE, Ph.D., Associate Professor of English.

STURLA EINARSSON, Ph.D., Professor of Astronomy.

PAULINE SPERRY, Ph.D., Associate Professor of Mathematics.

PHIL S. GRANT, M.A., Supervisor of Instruction in Subject A.

Subject A. I and II. No credit.

Mr. GRANT and Assistants

Three hours weekly. I, thirty 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, \$10; to those students who maintain an average grade of A during the first seven weeks of the semester \$5 will be refunded. For the regulations governing this requirement, see page 36.

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.
 CLARENCE M. HARING, D.V.M., Professor of Veterinary Science.
 OSCAR W. SCHALM, D.V.M., Ph.D., Professor of Veterinary Science.
 JACOB TRAUM, D.V.M., Professor of Veterinary Science.
 KENNETH B. DEOME, Ph.D., Assistant Professor of Animal Pathology.

UPPER DIVISION COURSES

101. Poultry Hygiene. (2) II. Mr. BEACH, Mr. DEOME
 Laboratory. Given each fourth semester.
 Prerequisite: Bacteriology 2 (completed or in progress) or Bacteriology
 1 (Davis); Physiology 1A and 1C or Animal Husbandry 110 (Davis).
 A study of the principles and measures for the maintenance of health
 of poultry.
 NOTE.—This course in addition to Entomology 117 meets the require-
 ment of 4 units of parasitology and animal pathology in the animal science
 curriculum for the poultry majors resident at Berkeley.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. HARING, Mr. BEACH, Mr. TRAUM, Mr. SCHALM, Mr. DEOME
 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. HARING, Mr. BEACH, Mr. TRAUM, Mr. SCHALM, Mr. DEOME
 NOTE.—Research in poultry diseases may be elected in above courses.

* Absent on leave, 1946-1947.

ZÖÖLOGY

- SUMNER C. BROOKS, Ph.D., Professor of Zoölogy.
- ¹ RICHARD GOLDSCHMIDT, Ph.D., M.D., Sc.D., Professor of Zoölogy.
- HAROLD KIRBY, Ph.D., Professor of Zoölogy.
- S. F. LIGHT, Ph.D., Professor of Zoölogy.
- ALDEN H. MILLER, Ph.D., Professor of Zoölogy and Director of the California Museum of Vertebrate Zoölogy.
- SAMUEL J. HOLMES, Ph.D., LL.D., Professor of Zoölogy, Emeritus.
- CHARLES A. KOFOID, Ph.D., Sc.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 (Chairman of the Department).
- J. E. GULLBERG, A.B., Associate Professor of Metrology.
- MORGAN HARRIS, Ph.D., Assistant Professor of Zoölogy.
- ROBERT C. STEBBINS, Ph.D., Assistant Professor of Zoölogy and Assistant Curator in Herpetology, California Museum of Vertebrate Zoölogy.
- A. STARKER LEOPOLD, Ph.D., Instructor in Zoölogy and Conservationist, California Museum of Vertebrate Zoölogy.
- FRANK A. PITELKA, Ph.D., Instructor in Zoölogy and Assistant Curator of Birds, California Museum of Vertebrate Zoölogy.
- RALPH I. SMITH, Ph.D., Instructor in Zoölogy.
- ELIZABETH SCOTT, M.A., Associate in Parasitology, for the spring semester.

Letters and Science List.—All undergraduate courses in zoölogy except 109 are included in the Letters and Science List of Courses. For regulations governing this list, see page 81.

Departmental Major Adviser: Mr. HARRIS.

Preparation for the Major. Required: Zoölogy 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 related 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.

Fees.—A fee of \$4.50 is required in courses 1A, 1B, 4, 100, 101c, 102c, 103c, 106, 107c, 109 (students in engineering exempted), 110, 111, 112, 113, 116, 124, 125, 140, 197 (if laboratory), 199 (if laboratory). This fee covers the cost of materials used. For breakage of material and special equipment in excess of the estimated amount a separate charge will be made.

¹ In residence fall semester only, 1946-1947.

LOWER DIVISION COURSES

- 1A. General Zoölogy. (4) I. Mr. HARRIS
 Lectures and laboratory.
 Prerequisite: Chemistry 1A. Fee, \$4.50.
 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. EAKIN
 Lectures and laboratory.
 Prerequisite: course 1A. Fee, \$4.50.
 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. Mr. EAKIN
 Laboratory.
 Prerequisite: course 1A and elementary chemistry. Fee, \$4.50.
10. General Biology. (3) 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

Prerequisites.—Course 1A and either 1B or an approved course in some field of biology are prerequisite to courses 101, 102, 110, 111, 112, and 140.

Course 1A or 10 and upper division standing are prerequisite to courses 114 and 116; upper division standing and a year's work in any of the biological sciences, to 117A–117B.

Courses 1A and 1B are prerequisite to courses 100, 103, 106, 107, 113, 123, 124, 125, 135, 136, and 137.

Upper division or graduate status in some biological or physical science is prerequisite to courses 119A–119B and 120A–120B.

100. Vertebrate Embryology. (4) I. Mr. EAKIN
 Lectures and laboratory. Fee, \$4.50.
 Details of development of the vertebrate body with emphasis on human embryology in lectures and on chick and pig in the laboratory.
101. Introduction to Physicochemical Biology. (2) I. Mr. BROOKS
 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. Mr. BROOKS
 Prerequisite: course 101 (may be taken concurrently). Fee, \$4.50.

102. Introduction to Physicochemical Biology. (2) II. Mr. BROOKS
Prerequisite: course 101.
A continuation of course 101, applied to reactions, enzymes, oxidation, growth and adaptation, and the effects of temperature and radiation.
- 102c. Physicochemical Biology Laboratory. (2) II. Mr. BROOKS
Prerequisite: courses 101, 101c, and 102 (may be taken concurrently).
Fee, \$4.50.
- *103. Experimental Embryology. (2) I. Mr. EAKIN
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
Enrollment limited to ten students. Application for admission should be made before the first day of instruction. Fee, \$4.50.
106. Comparative Anatomy of the Vertebrates. (4) II. Mr. HARRIS
Lectures and laboratory. Fee, \$4.50.
Recommended: Zoölogy 100.
Evolution of organ systems and phylogeny of the major vertebrate groups.
- *107. Cytology. (2) II. Mr. GOLDSCHMIDT
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). Fee, \$4.50.
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) Mr. KIRBY
Lectures and laboratory.
Consideration of the contributions made through study of various groups of protozoa to problems of biology. Fee, \$4.50.
111. General Parasitology. (4) I. Mr. KIRBY
Lectures and laboratory.
Study of the characteristics, life history, and host relationships of animal parasites other than protozoa and arthropods, with emphasis on helminthology. Fee, \$4.50.
112. Invertebrate Zoölogy. (4) I. Mr. LIGHT
Lectures, laboratory and field work. Fee, \$4.50.
Anatomy, classification, and natural history of common invertebrate animals.
Given also at the seashore in alternate summers (in odd-numbered years).

* Not to be given, 1946-1947.

113. Natural History of the Vertebrates. (4) II.
 Mr. MILLER, Mr. BENSON, Mr. STEBBINS
 Lectures, field trips, and laboratory. Fee, \$4.50.
 The birds, mammals, reptiles, and amphibians, chiefly of California; identification of species; observational methods in study of behavior and habitat relations; systematics, distribution, and speciation. Field work emphasized.
114. Genetics. (3) I. Mr. GOLDSCHMIDT
 The facts of heredity, basic and advanced, including human heredity.
116. Applied Vertebrate Zoölogy. (3) I. Mr. BENSON, Mr. LEOPOLD
 Lectures and laboratory.
 Relations of vertebrates to their physical and biotic environments; their bearing on human affairs; identifications of species; principles governing encouragement and control. Fee, \$4.50.
- *117A-117B. History of Biology. (2-2) Yr. The STAFF
 Course 117A is not prerequisite to course 117B.
- 119A-119B. Optics and Metrology in Biology. (2-2) Yr. Mr. GULLBERG
 119A or its equivalent is prerequisite for 119B.
 119A. The theoretical principles and the critical use of the microscope, spectroscope, and other primary optical instruments.
 119B. The theory and advanced technique of scientific photography, photomicrography, and special photometric methods.
- 120A-120B. Electrical Measurements in Biology. (2-2) Yr. Mr. GULLBERG
- *121. Advanced Physicochemical Biology. (2) I. Mr. BROOKS
 Prerequisite: Mathematics 1, Physics 2A-2B, Chemistry 1A-1B and 8, and Zoölogy 1A, and a reading knowledge of German. Recommended: Mathematics 3A-3B, Physics 3A-3B, Chemistry 9 and 109, Biochemistry 105A, Botany 1A-1B, Zoölogy 101, 102, and 112, and a reading knowledge of French.
 The molecular structure and permeability relations of protoplasm.
122. Advanced Physicochemical Biology. (2) I. Mr. BROOKS
 Prerequisite: course 121, or equivalent training. Biological effects of radiant energy.
- *123. Invertebrate Embryology. (2) II. _____
 Special emphasis will be given to the comparative and experimental embryology of marine invertebrates.
124. Experimental Invertebrate Zoölogy. (4) I. Mr. SMITH
 A study of the major invertebrate groups from a functional point of view with emphasis, in the laboratory, upon individual problems in nutrition, coördination, sensation, etc. Fee, \$4.50.
125. General Ecology. (4) II. Mr. PITELKA
 Lectures, laboratory, and field work. Fee, \$4.50.
 Prerequisite: 2 semesters of upper division work in biology, and one of the following: Zoölogy 112, 113, Entomology 112, Physiology 100A-100B, or Botany 108.
 Interrelations of organisms and their environment, study of communities, succession, effects of physical gradients, food chains; analyses involving invertebrates, vertebrates, and plants.

* Not to be given, 1946-1947.

135. Mammalogy. (2) I. Mr. BENSON
Lecture and laboratory.
Prerequisite: Zoölogy 113.
Advanced study of classification, anatomy, and behavior of mammals.
136. Ornithology. (2) I. Mr. MILLER
Lecture and laboratory.
Prerequisite: Zoölogy 113.
Advanced study of classification, anatomy, and behavior of birds.
137. Herpetology. (2) II. Mr. STEBBINS
Lecture and laboratory.
Prerequisite: Zoölogy 113.
Advanced study of classification, anatomy, and behavior of amphibians and reptiles.
140. Internal Animal Parasites of Man. (4) II. Mr. KIRBY, Mrs. SCOTT
Lectures and laboratory.
Materials, laboratory methods, and use of literature in the study of protozoan and helminth parasites of man. Fee, \$4.50.
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. Laboratory fee, \$4.50 a semester.
199. Special Study for Advanced Undergraduates. (1-4) I and II. The STAFF
All work supplementary to courses above. Credit to be fixed in each case. Laboratory fee, \$4.50.
Prerequisite: senior standing and at least a B average in upper division courses in zoölogy.

GRADUATE COURSES

Concerning conditions for admission to graduate courses, see page 146.

208. Comparative Anatomy of the Invertebrates. (3) II. Mr. LIGHT
Lectures, seminar, and laboratory.
212. Advanced Marine Zoölogy. (6) Mr. LIGHT, Mr. PITELKA, Mr. SMITH
Given at the seashore in alternate summers (in odd-numbered years). This course or its equivalent at an approved marine biological station is required of all candidates for the Ph.D. degree in Zoölogy.
220. Seminar on Speciation and Adaptive Radiation in Vertebrates. (1) I.
Prerequisite: course 113. Mr. MILLER, Mr. BENSON
Seminar on problems of speciation and isolating mechanisms in vertebrates. Topics will vary from year to year.
- 224A-224B. Research. (1-8; 1-8) Yr. The STAFF
Original study on special topics in the 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 according to work accomplished.

240. Zoölogy Seminar. (No credit) I and II. The STAFF
 Meetings for the presentation of original work by the faculty, guest
 investigators, and graduate students.
- *241. Seminar in Protozoölogy and Parasitology. (1) II. Mr. KIRBY
242. Seminar in Experimental Morphogenesis. (1) I.
Mr. GOLDSCHMIDT, Mr. HARRIS, Mr. EAKIN
243. Vertebrate Review. (No credit.) II. Mr. BENSON, Mr. PITELKA
 Review of current literature.

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 April 2, 1946) by a total of 246,503 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.

* Not to be given, 1946-1947.

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UNIVERSITY OF CALIFORNIA

BULLETIN

Prospectus of the

COLLEGE OF AGRICULTURE

1946-1947

BERKELEY • DAVIS • LOS ANGELES • RIVERSIDE

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Students at Berkeley and Los Angeles should consult the General Catalogues published on those campuses for courses given in Colleges other than Agriculture.

UNIVERSITY OF CALIFORNIA

Prospectus of the

**COLLEGE OF
AGRICULTURE**

1946-1947



BERKELEY · DAVIS · LOS ANGELES · RIVERSIDE

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CALENDAR, 1946-1947

FIRST SUMMER SESSION, 1946

June 22, Saturday	} Registration.
June 24, Monday	
June 24, Monday	Instruction begins.
July 4, Thursday	Independence Day (Academic and Administrative holiday).
Aug. 2, Friday	First Summer Session ends.

SECOND SUMMER SESSION, 1946

Aug. 3, Saturday	} Registration.
Aug. 5, Monday	
Aug. 5, Monday	Instruction begins.
Sept. 2, Monday	Labor Day (Academic and Administrative holiday).
Sept. 13, Friday	Second Summer Session ends.

FALL SEMESTER, 1946-1947

Sept. 19, Thursday	} Registration.*
Sept. 21, Saturday	
Sept. 23, Monday	Instruction begins.
Oct. 12, Saturday	Columbus Day (Academic and Administrative holiday).
Nov. 28, Thursday	} Thanksgiving Recess (Academic holiday).
Nov. 30, Saturday	
Dec. 20, Friday	} Christmas Recess (Academic holiday).
1947	
Jan. 4, Saturday	} Final examinations.
Jan. 27, Monday	
Feb. 6, Thursday	} Fall Semester ends.
Feb. 6, Thursday	

SPRING SEMESTER, 1947

Feb. 20, Thursday	} Registration.*
Feb. 22, Saturday	
Feb. 24, Monday	Instruction begins.
May 30, Friday	Memorial Day (Academic and Administrative holiday).
June 9, Monday	} Final examinations.
June 19, Thursday	
June 19, Thursday	Spring Semester ends.

* Students planning to register at Davis, see page 37.



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- LOREN L. DAVIS, M.S., Associate in the Experiment Station (Agronomy), Davis.
- LUTHER D. DAVIS, Ph.D., Professor of Pomology and Pomologist in the Experiment Station, Davis.
- LEONARD H. DAY, M.S., Associate Pomologist in the Experiment Station, Davis.
- PAUL R. DAY, Ph.D., Assistant Professor of Soil Physics and Assistant Soil Physicist in the Experiment Station.
- PAUL H. DEBACH, Ph.D., Assistant Entomologist in the Experiment Station, Riverside.
- PAUL D. DELAY, D.V.M., Associate in the Experiment Station (Veterinary Science).
- EVERETT R. DEMPSTER, Ph.D., Assistant Professor of Genetics and Assistant Geneticist in the Experiment Station.
- KENNETH B. DEOME, Ph.D., Assistant Professor of Animal Pathology and Assistant Animal Pathologist in the Experiment Station.
- ROBERT C. DICKSON, M.S., Associate in the Experiment Station (Entomology), Riverside.
- LOYD D. DONEEN, Ph.D., Associate Irrigation Agronomist in the Experiment Station, Davis.
- MAURICE DONNELLY, Ph.D., Research Associate in the Experiment Station (Orchard Management), Riverside.
- WALTER H. DORE, B.S., Chemist in the Experiment Station.
- JAMES R. DOUGLAS, Ph.D., Assistant Professor of Parasitology and Assistant Entomologist in the Experiment Station, Davis.
- WALTER EBELING, Ph.D., Lecturer in Entomology and Associate Entomologist in the Experiment Station, Los Angeles.
- JOHN E. ECKERT, Ph.D., Professor of Entomology and Apiculturist in the Experiment Station, Davis.
- †NIELS E. EDLEFSEN, Ph.D., Professor of Irrigation and Irrigation Engineer in the Experiment Station, Davis.
- †CARL C. EPLING, Ph.D., Professor of Botany, Plant Systematist in the Experiment Station, Curator of the Herbarium, Los Angeles.

† Absent on leave, 1946-1947.

‡ Absent on sabbatical leave, 1946-1947.

- HENRY E. ERDMAN, Ph.D., Professor of Agricultural Economics, Agricultural Economist in the Experiment Station, and Agricultural Economist on the Giannini Foundation.
- KATHERINE ESAU, Ph.D., Associate Professor of Botany and Associate Botanist in the Experiment Station, Davis.
- EDWARD O. ESSIG, M.S., Professor of Entomology and Entomologist in the Experiment Station.
- HERBERT M. EVANS, M.D., Research Associate in Experimental Biology in the Experiment Station.
- WILLIAM H. EWART, Ph.D., Assistant Entomologist in the Experiment Station, Riverside.
- JAMES P. FAIRBANK, B.S., Associate in Agricultural Engineering and Associate in the Experiment Station, Davis.
- HOWARD S. FAWCETT, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station, Riverside.
- GLENN L. FINNEY, Associate in the Experiment Station (Beneficial Insects).
- SOLOMON FISHMAN, Ph.D., Assistant Professor of English, Davis.
- STANLEY E. FLANDERS, Ph.D., Associate Entomologist in the Experiment Station, Riverside.
- ROBERT L. FORBES, B.S., Associate in the Experiment Station (Agronomy), Davis.
- NORMAN W. FRAZIER, Ph.D., Junior Entomologist in the Experiment Station.
- JULIUS H. FREITAG, Ph.D., Assistant Professor of Entomology and Assistant Entomologist in the Experiment Station.
- ORVAL C. FRENCH, M.S., Assistant Professor of Agricultural Engineering and Assistant Agricultural Engineer in the Experiment Station, Davis.
- EMANUEL FRITZ, M.E., M.F., Associate Professor of Forestry.
- HOWARD B. FROST, Ph.D., Associate Plant Breeder in the Experiment Station, Riverside.
- MAX W. GARDNER, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
- MILTON E. GARDNER, Ph.D., Assistant Professor of Physics and Assistant Physicist in the Experiment Station, Davis.
- CHARLES M. GILBERT, Ph.D., Assistant Professor of Geology, Davis.
- HELEN L. GILLUM, Ph.D., Associate Professor of Home Economics and Associate Biochemist in the Experiment Station.
- LYLE G. GOAR, Associate in the Experiment Station (Agronomy), El Centro.
- HAROLD GOSS, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
- CHARLES R. GRAU, B.S. Associate in the Experiment Station (Poultry Husbandry).
- JOHN W. GREGG, B.S., Professor of Landscape Design and University Consultant in Landscape Design.
- PAUL W. GREGORY, Sc.D., Associate Professor of Animal Husbandry and Associate Animal Husbandman in the Experiment Station, Davis.
- PAUL L. GUEST, Ph.D., Assistant Chemist in the Experiment Station, Riverside.
- HAROLD R. GUILBEET, M.S., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
- FRANCIS A. GUNTHER, M.A., Associate in the Experiment Station (Entomology), Riverside.
- JAMES F. GUYMON, Ph.D., Assistant Enologist in the Experiment Station, Davis.
- ALBERT R. C. HAAS, Ph.D., Plant Physiologist in the Experiment Station, Riverside.
- ROBERT M. HAGAN, A.B., Associate in the Experiment Station (Irrigation), Davis.
- KARL W. HAGEN, JR., B.S., Associate in the Experiment Station (Veterinary Science).
- FREDERICK F. HALMA, Ph.D., Professor of Subtropical Horticulture and Subtropical Horticulturist in the Experiment Station, Los Angeles.
- GORDIE C. HANNA, B.S., Lecturer in Truck Crops and Associate Olericulturist in the Experiment Station, Davis.
- CARL J. HANSEN, M.S., Associate in Pomology and Assistant Pomologist in the Experiment Station, Davis.
- HANS N. HANSEN, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
- CLARENCE M. HARING, D.V.M., Professor of Veterinary Science, and Veterinarian in the Experiment Station.
- FRANK F. HARRADINE, B.S., Assistant Soil Technologist in the Experiment Station.
- GEORGE J. HARRISON, B.L., Associate in the Experiment Station (Agronomy), Davis.

- GEORGE H. HART, D.V.M., M.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
- HUDSON T. HARTMAN, M.A., Associate in the Experiment Station (Pomology), Davis.
- WILLIAM A. HARVEY, M.S., Associate in Botany and Associate in the Experiment Station, Davis.
- WILLIAM Z. HASSID, Ph.D., Associate Professor of Plant Nutrition and Associate Chemist in the Experiment Station.
- ARTHUR W. HAUPT, Ph.D., Associate Professor of Botany, Los Angeles.
- HUBERT HEITMAN, Ph.D., Assistant Professor of Animal Husbandry and Assistant Animal Husbandman in the Experiment Station, Davis.
- ARTHUR H. HENDRICKSON, Ph.D., Pomologist in the Experiment Station, Davis.
- WILLIAM B. HERMS, Sc.D., Professor of Parasitology and Entomologist in the Experiment Station.
- CLARON O. HESSE, Ph.D., Associate in the Experiment Station (Pomology), Davis.
- WILLIAM B. HEWITT, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station, Davis.
- PAUL L. HIBBARD, B.S., Chemist in the Experiment Station, Emeritus.
- VERNARD B. HICKEY, A.B., Associate Supervisor of Physical Education, Davis.
- WILLIAM R. HINSHAW, D.V.M., M.S., Ph.D., Professor of Veterinary Science and Veterinarian in the Experiment Station, Davis.
- DENNIS R. HOAGLAND, M.A., Professor of Plant Nutrition and Plant Physiologist in the Experiment Station.
- LENORA A. HOHL, Ph.D., Instructor in Food Technology and Assistant Mycologist in the Experiment Station.
- JAMES K. HOLLOWAY, B.S., Associate in the Experiment Station (Beneficial Insects).
- SIDNEY S. HOOS, Ph.D., Associate Professor of Agricultural Economics, Associate Agricultural Economist in the Experiment Station, and Associate Agricultural Economist on the Giannini Foundation.
- WILLIAM M. HOSKINS, Ph.D., Professor of Entomology and Entomologist in the Experiment Station.
- BYRON R. HOUSTON, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station, Davis.
- WALTER L. HOWARD, Ph.D., Professor of Pomology and Pomologist in the Experiment Station, Emeritus.
- CARROLL E. HOWELL, M.S., Associate in Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
- MARTIN R. HUBERTY, Engineer, Professor of Irrigation and Irrigation Engineer in the Experiment Station, Los Angeles.
- CARL B. HUFFAKER, Ph.D., Assistant Entomologist in the Experiment Station.
- ELMER H. HUGHES, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
- WINIFRED C. IRWIN, M.A., Instructor in Home Economics, Davis.
- NICHOLAS R. ITTNER, B.S., Associate in the Experiment Station, El Centro.
- EUGENE L. JACK, Ph.D., Associate Professor of Dairy Industry and Associate Dairy Technologist in the Experiment Station, Davis.
- HARRY E. JACOB, M.S., Associate Professor of Viticulture and Associate Viticulturist in the Experiment Station, Davis.
- LOUIS JACOBSON, B.A., Assistant Plant Biochemist in the Experiment Station.
- JAMES A. JENKINS, Ph.D., Assistant Professor of Genetics and Assistant Geneticist in the Experiment Station.
- HANS JENNY, Sc.D., Professor of Soil Chemistry and Morphology and Soil Chemist and Morphologist in the Experiment Station.
- LEE R. JEFFSON, Ph.D., Junior Entomologist in the Experiment Station, Riverside.
- CLARENCE N. JOHNSTON, B.S., M.E., Associate Professor of Irrigation and Associate Irrigation Engineer in the Experiment Station, Davis.
- MAYNARD A. JOSLYN, Ph.D., Associate Professor of Food Technology and Associate Biochemist in the Experiment Station.
- RAYMOND M. KEEFER, Ph.D., Assistant Professor of Chemistry and Assistant Chemist in the Experiment Station, Davis.
- WALTER P. KELLEY, Ph.D., Professor of Soil Chemistry and Soil Chemist in the Experiment Station.

- JAMES B. KENDRICK, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station, Davis.
- BARBARA M. KENNEDY, Ph.D., Instructor in Home Economics and Junior Biochemist in the Experiment Station.
- JOHN R. KING, Ph.D., Assistant Pomologist in the Experiment Station, Davis.
- JOSEPH KITTREDGE, Ph.D., Professor of Forestry and Forest Ecologist in the Experiment Station.
- MAX KLEIBER, Sc.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
- LEO J. KLOTZ, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station, Riverside.
- JAMES E. KNOTT, Ph.D., Sc.D., Professor of Truck Crops and Plant Physiologist in the Experiment Station, Davis.
- FRANK H. KRATZER, Ph.D., Assistant Professor of Poultry Husbandry and Assistant Poultry Husbandman in the Experiment Station, Davis.
- MYRON E. KRUEGER, M.S., Professor of Forestry and Associate Forester in the Experiment Station.
- GEORGE M. KUZNETS, Ph.D., Assistant Professor of Agricultural Economics, Assistant Agricultural Economist in the Experiment Station, and Assistant Agricultural Economist on the Giannini Foundation.
- CATHERINE LANDRETH, Ph.D., Associate Professor of Home Economics and Director of the Nursery School, Institute of Child Welfare.
- WILLIAM H. LANGE, JR., Ph.D., Lecturer in Entomology and Assistant Entomologist in the Experiment Station, Davis.
- HORTON M. LAUDE, Ph.D., Assistant Professor of Agronomy and Assistant Agronomist in the Experiment Station, Davis.
- BERT M. LAURANCE, E.M., Associate in the Experiment Station (Soils and Plant Nutrition), Riverside.
- LYSLE D. LEACH, Ph.D., Associate Professor of Plant Pathology and Associate Plant Pathologist in the Experiment Station, Davis.
- SAMUEL LEPKOVSKY, Ph.D., Professor of Poultry Husbandry and Poultry Husbandman in the Experiment Station.
- I. MICHAEL LERNER, Ph.D., Associate Professor of Poultry Husbandry and Associate Poultry Husbandman in the Experiment Station.
- JAMES W. LESLEY, Ph.D., Associate Geneticist in the Experiment Station, Riverside.
- HAROLD D. LEWIS, B.S., Associate in Agricultural Engineering and Associate in the Experiment Station, Davis.
- GEORGE F. LIEBIG, A.B., Associate in the Experiment Station (Soils and Plant Nutrition), Riverside.
- OMUND LILLELAND, Ph.D., Pomologist in the Experiment Station, Davis.
- DAVID L. LINDGREN, Ph.D., Associate Entomologist in the Experiment Station, Riverside.
- E. GORTON LINSLEY, Ph.D., Assistant Professor of Entomology and Assistant Entomologist in the Experiment Station.
- MARY L. LONG, M.S., Associate in the Experiment Station (Dairy Industry), Davis.
- FREDERICK W. LORENZ, Ph.D., Assistant Professor of Poultry Husbandry and Assistant Poultry Husbandman in the Experiment Station, Davis.
- OSCAR A. LORENZ, Ph.D., Assistant Professor of Truck Crops and Assistant Olericulturist in the Experiment Station, Davis.
- COBY LORENZEN, JR., M.S., Associate in Agricultural Engineering and Assistant Agricultural Engineer in the Experiment Station, Davis.
- R. MERTON LOVE, Ph.D., Associate Professor of Agronomy and Associate Agronomist in the Experiment Station, Davis.
- JOHN H. MACGILLIVRAY, Ph.D., Associate Professor of Truck Crops and Olericulturist in the Experiment Station, Davis.
- WILLIAM W. MACKIE, M.S., Agronomist in the Experiment Station, Emeritus.
- GORDON MACKINNEY, Ph.D., Associate Professor of Food Technology and Associate Biochemist in the Experiment Station.

- AGNES C. McCLELLAND, M.A., Associate in Home Economics.
 ETHEL C. McNEIL, Ph.D., Junior Animal Pathologist in the Experiment Station (Veterinary Science), Davis.
 WILLIAM E. MADERIGUS, D.V.M., Junior Veterinarian in the Experiment Station.
 STEWART H. MADIN, D.V.M., Associate in the Experiment Station (Veterinary Science).
 BEN A. MADSON, B.S.A., Professor of Agronomy and Agronomist in the Experiment Station, Davis.
 LOUIS K. MANN, Ph.D., Assistant Professor of Truck Crops and Assistant Olericulturist in the Experiment Station, Davis.
 GEORGE L. MARSH, M.S., Assistant Professor of Food Technology and Assistant Chemist in the Experiment Station.
 JAMES C. MARTIN, B.S., Associate Chemist in the Experiment Station (Plant Nutrition).
 JAMES P. MARTIN, Ph.D., Junior Chemist in the Experiment Station, Riverside.
 ANDREW P. MAZURAK, M.F., Associate in the Experiment Station (Soils).
 SYLVESTER W. MEAD, M.S., Associate Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
 GEORGE L. MEHREN, Ph.D., Assistant Professor of Agricultural Economics, Assistant Agricultural Economist in the Experiment Station, and Assistant Agricultural Economist on the Giannini Foundation.
 AXEL L. MELANDER, Sc.D., Research Associate in the Experiment Station (Beneficial Insects), Riverside.
 WILLIAM A. MERSMAN, Ph.D., Assistant Professor of Mathematics and Assistant Mathematician in the Experiment Station, Davis.
 ROBERT L. METCALF, Ph.D., Assistant Entomologist in the Experiment Station, Riverside.
 ABE E. MICHELbacher, Ph.D., Assistant Professor of Entomology and Assistant Entomologist in the Experiment Station.
 WOODROW W. MIDDLEKAUFF, Ph.D., Assistant Professor of Entomology and Assistant Entomologist in the Experiment Station.
 JOHN T. MIDDLETON, Ph.D., Assistant Plant Pathologist in the Experiment Station, Riverside.
 MILTON A. MILLER, Ph.D., Assistant Professor of Zoölogy and Assistant Zoölogist in the Experiment Station, Davis.
 PIERRE A. MILLER, M.S., Associate Professor of Plant Pathology and Associate Plant Pathologist in the Experiment Station, Los Angeles.
 ROBERT F. MILLER, M.S., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
 AGNES FAY MORGAN, Ph.D., Professor of Home Economics and Biochemist in the Experiment Station.
 LEONARD L. MORRIS, Ph.D., Assistant Professor of Truck Crops and Assistant Olericulturist in the Experiment Station, Davis.
 BEN D. MOSES, B.S., Associate Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station, Davis.
 EMLI MRAK, Ph.D., Associate Professor of Food Technology and Associate Mycologist in the Experiment Station.
 COURTLAND S. MUDGE, Ph.D., Professor of Bacteriology and Dairy Bacteriologist in the Experiment Station, Davis.
 WALTER MULFORD, F.E., Sc.D., Professor of Forestry and Forest Economist on the Giannini Foundation.
 JAMES L. MYLER, M.S., Associate in Agronomy and Associate in the Experiment Station, Davis.
 *GWENDOLYN B. NEEDHAM, Ph.D., Lecturer in English, Davis.
 IVER N. NELSON, Ph.D., Associate Professor of Spanish, Davis.
 LOREN W. NEUBAUER, M.S., Assistant Professor of Agricultural Engineering and Assistant Agricultural Engineer in the Experiment Station, Davis.
 RUTH OKEY, Ph.D., Professor of Home Economics and Biochemist in the Experiment Station.
 HAROLD P. OLMO, Ph.D., Associate Professor of Viticulture and Associate Viticulturist in the Experiment Station, Davis.

* Absent on war leave.

- JOHN J. ORTEGA, B.S., Associate in the Experiment Station (Entomology), Riverside.
JOHN W. OSWALD, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
HEBERT I. OTT, D.V.M., Associate in the Experiment Station (Veterinary Science).
ROY OVERSTREET, Ph.D., Associate Professor of Soil Chemistry and Associate Soil Chemist in the Experiment Station.
EDWIN R. PARKER, Ph.D., Associate Horticulturist in the Experiment Station, Riverside.
FRANK G. PARSONS, B.S., Associate in the Experiment Station (Agronomy), Davis.
CHARLES G. PATTEN, Ph.D., Assistant Professor of Physics and Assistant Physicist in the Experiment Station, Davis.
ESTHER P. PERRY, Ph.D., Junior Soil Technologist in the Experiment Station.
RUSSELL L. PERRY, M.E., Associate Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station, Davis.
HERMAN J. PHAFF, Ph.D., Instructor in Food Technology and Assistant Microbiologist in the Experiment Station.
CLEMENT A. PHILLIPS, M.S., Associate in Dairy Industry and Associate in the Experiment Station, Davis.
GUY L. PHELPS, M.S., Associate in Pomology and Associate Pomologist in the Experiment Station, Davis.
ARTHUR F. PILLSBURY, Engineer, Assistant Professor of Irrigation and Associate Irrigation Engineer in the Experiment Station, Los Angeles.
ORDA A. PLUNKETT, Ph.D., Associate Professor of Botany, Los Angeles.
JOHN B. POWERS, B.S. in E.E., Associate Agricultural Engineer in the Experiment Station, Davis.
EDWARD L. PROEBSTING, Ph.D., Professor of Pomology and Pomologist in the Experiment Station, Davis.
VERNON J. PUEYEAR, Ph.D., Associate Professor of History, Davis.
HENRY J. QUAYLE, M.S., Professor of Entomology and Entomologist in the Experiment Station, Emeritus.
NOEL P. RALSTON, M.A., Assistant Professor of Animal Husbandry, Assistant Animal Husbandman in the Experiment Station, and Superintendent of Official Advanced Registry Testing, Davis.
THOMAS E. RAWLINS, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
HOWARD S. REED, Ph.D., Professor of Plant Physiology and Plant Physiologist in the Experiment Station.
WILLIAM M. REGAN, M.A., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.
HAROLD G. REIBER, Ph.D., Associate Professor of Chemistry and Associate Chemist in the Experiment Station, Davis.
G. ARTHUR RICHARDSON, Ph.D., Associate Professor of Dairy Industry and Associate Dairy Chemist in the Experiment Station, Davis.
CHARLES M. RICK, JR., Ph.D., Assistant Professor of Truck Crops and Assistant Geneticist in the Experiment Station, Davis.
LOUIS A. RIEHL, Ph.D., Junior Entomologist in the Experiment Station, Riverside.
CHESTER L. ROADHOUSE, D.V.M., Professor of Dairy Industry and Dairy Technologist in the Experiment Station, Davis.
WILFRED T. ROBBINS, M.D., Assistant Physician, Davis.
WILFRED W. ROBBINS, Ph.D., Professor of Botany and Botanist in the Experiment Station, Davis.
EDWARD B. ROESSLEE, Ph.D., Associate Professor of Mathematics and Associate Statistician in the Experiment Station, Davis.
LAUREN E. ROSENBERG, Ph.D., Assistant Professor of Zoölogy and Assistant Zoölogist in the Experiment Station, Davis.
BERT A. RUDOLPH, Ph.D., Associate Plant Pathologist in the Experiment Station, San Jose.
ARTHUR W. SAMPSON, Ph.D., Professor of Forestry and Plant Ecologist in the Experiment Station.
MAURICE SANDS, Lecturer in Home Furnishing.
MYRON A. SCHALL, A.B., Assistant Supervisor in Physical Education, Davis.

- OSCAR W. SCHALM, D.V.M., Ph.D., Professor of Veterinary Science and Veterinarian in the Experiment Station.
- HENRY SCHNEIDER, Ph.D., Associate in the Experiment Station (Plant Pathology), Riverside.
- CHARLES A. SCHROEDER, M.S., Assistant Professor of Subtropical Horticulture, and Assistant Plant Morphologist in the Experiment Station, Los Angeles.
- HAZEL V. SCHULZE, Ph.D., Instructor in Home Economics, Davis.
- FLORA M. SCOTT, Ph.D., Associate Professor of Botany, Associate Plant Anatomist in the Experiment Station, Assistant Director of the Botanical Garden, Los Angeles.
- WENDELL F. SELLERS, B.Sc., Associate in the Experiment Station (Beneficial Insects), Riverside.
- HENRY H. SEVERIN, Ph.D., Entomologist in the Experiment Station.
- ARCHIBALD D. SHAMEL, B.S., Associate in the Experiment Station (Orchard Management), Riverside.
- SHERWOOD W. SHEAR, Ph.D., Associate Agricultural Economist in the Experiment Station and Associate Agricultural Economist on the Giannini Foundation.
- HARRY W. SHEPHERD, B.S., Professor of Landscape Design.
- JAMES H. SHIDLER, Ph.D., Instructor in History, Davis.
- PATRICIA G. SIKES, M.A., Associate in English, Davis.
- WALTON B. SINCLAIR, Ph.D., Associate Biochemist in the Experiment Station, Riverside.
- FRANCIS L. SMITH, Ph.D., Assistant Agronomist in the Experiment Station, Davis.
- GORDON L. SMITH, M.S., Assistant Entomologist in the Experiment Station.
- HARRY S. SMITH, M.A., Professor of Entomology and Entomologist in the Experiment Station, Riverside.
- LESLIE M. SMITH, Ph.D., Lecturer in Entomology and Associate Entomologist in the Experiment Station, Davis.
- PAUL G. SMITH, Ph.D., Assistant Professor of Truck Crops and Assistant Olericulturist in the Experiment Station, Davis.
- RALPH E. SMITH, Sc.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station, Emeritus.
- RAY F. SMITH, Ph.D., Instructor in Entomology and Junior Entomologist in the Experiment Station.
- ROY J. SMITH, Ph.D., Assistant Professor of Agricultural Economics, Assistant Agricultural Economist in the Experiment Station, and Assistant Agricultural Economist on the Giannini Foundation, Los Angeles.
- WILLIAM C. SNYDER, Ph.D., Associate Professor of Plant Pathology and Associate Plant Pathologist in the Experiment Station.
- OLENUS L. SPONSLER, Ph.D., Professor of Botany, Los Angeles.
- EUGENE M. STAFFORD, Ph.D., Assistant Entomologist in the Experiment Station, Davis.
- JOHN L. STAHL, A.B., Associate in Landscape Gardening, Davis.
- ERNEST H. STANFORD, Ph.D., Assistant Professor of Agronomy and Assistant Agronomist in the Experiment Station, Davis.
- G. LEDYARD STEBBINS, Ph.D., Associate Professor of Genetics and Associate Geneticist in the Experiment Station.
- EDWARD A. STEINHAUS, Ph.D., Assistant Professor of Bacteriology and Assistant Insect Pathologist in the Experiment Station.
- MORRIS A. STEWART, Ph.D., Associate Professor of Parasitology and Associate Entomologist in the Experiment Station.
- WILLIAM S. STEWART, Ph.D., Assistant Plant Physiologist in the Experiment Station, Riverside.
- CLIFFORD R. STOCKING, Ph.D., Assistant Professor of Botany and Assistant Botanist in the Experiment Station, Davis.
- TRACY I. STOREE, Ph.D., Professor of Zoölogy and Zoölogist in the Experiment Station, Davis.
- RAYMOND E. STORIE, B.S., Lecturer in Soil Technology and Soil Technologist in the Experiment Station.
- PERRY R. STOUT, Ph.D., Associate Professor of Plant Nutrition and Associate Chemist in the Experiment Station.
- GEORGE A. STROMGREEN, A.B., Assistant Supervisor of Physical Education, Davis.
- COIT A. SUNNENSON, M.S., Associate in the Experiment Station (Agronomy), Davis.
- SIDNEY S. SUTHERLAND, M.S., Assistant Professor of Education and Supervisor of Teacher-Training in Agriculture, Davis.

- WILLIAM N. TAKAHASHI, Ph.D., Instructor in Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
- NIKITA P. TARASSUK, Ph.D., Assistant Professor of Dairy Industry and Assistant Dairy Chemist in the Experiment Station, Davis.
- JAMES R. TAVERNETTI, M.S., Associate Agricultural Engineer in the Experiment Station, Davis.
- LEWIS W. TAYLOR, Ph.D., Professor of Poultry Husbandry and Poultry Husbandman in the Experiment Station.
- PAUL S. TAYLOR, Ph.D., Professor of Economics.
- DOROTHY S. THOMAS, Ph.D., Professor of Rural Sociology, Rural Sociologist in the Experiment Station, and Rural Sociologist on the Giannini Foundation.
- H. EARL THOMAS, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
- PHILIP H. TIMBERLAKE, M.A., Associate Entomologist in the Experiment Station, Riverside.
- JAMES M. TINLEY, Ph.D., Professor of Agricultural Economics, Agricultural Economist in the Experiment Station, and Agricultural Economist on the Giannini Foundation.
- CHRISTIAN M. TOMPKINS, Ph.D., Associate Plant Pathologist in the Experiment Station.
- IRVING F. TOOMEY, B.S., Supervisor of Physical Education, in charge of Athletic Activities in the College of Agriculture, Davis.
- JACOB TRAUM, D.V.M., Professor of Veterinary Science and Veterinarian in the Experiment Station.
- WARREN P. TUFTS, Ph.D., Professor of Pomology and Pomologist in the Experiment Station, Davis.
- FRANKLIN M. TURRELL, Ph.D., Assistant Plant Physiologist in the Experiment Station, Riverside.
- ALBERT ULRICH, Ph.D., Assistant Plant Physiologist in the Experiment Station.
- ROBERT L. USINGER, Ph.D., Assistant Professor of Entomology and Assistant Entomologist in the Experiment Station.
- EDWIN C. VAN DYKE, M.D., Professor of Entomology, Emeritus.
- GEORGE H. VANSSELL, M.A., Associate in the Experiment Station (Entomology), Davis.
- ALBERT P. VANSELOW, Ph.D., Associate Chemist in the Experiment Station, Riverside.
- H. LELAND VAUGHAN, B.S., Associate Professor of Landscape Design.
- REESE H. VAUGHN, Ph.D., Assistant Professor of Food Technology and Associate Bacteriologist in the Experiment Station.
- FRANK J. VEHRMEYER, C.E., Ph.D., Professor of Irrigation and Irrigation Engineer in the Experiment Station, Davis.
- DAVID H. VOLMAN, Ph.D., Assistant Professor of Chemistry and Assistant Chemist in the Experiment Station, Davis.
- EDWIN C. VOORHIES, B.S., Professor of Agricultural Economics, Agricultural Economist in the Experiment Station, and Agricultural Economist on the Giannini Foundation.
- KENNETH A. WAGNON, B.S., Assistant in Animal Husbandry, Davis.
- HARRY B. WALKER, C.E., Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station, Davis.
- JAMES M. WALLACE, Ph.D., Associate Plant Pathologist in the Experiment Station, Riverside.
- SIEGFRIED V. WANTRUP, Dr.Agr., Professor of Agricultural Economics, Agricultural Economist in the Experiment Station, Agricultural Economist on the Giannini Foundation.
- JEAN WARREN, Ph.D., Assistant Professor of Home Economics and Assistant Home Economist in the Experiment Station, Davis.
- DAVID WEEKS, C.E., Ph.D., Associate Professor of Agricultural Economics, Associate Agricultural Economist in the Experiment Station, and Associate Agricultural Economist on the Giannini Foundation.
- T. ELLIOT WEIER, Ph.D., Associate Professor of Botany and Associate Botanist in the Experiment Station, Davis.
- WALTER W. WEIR, Drainage Engineer in the Experiment Station.
- WILLIAM O. WILLIAMS, Ph.D., Assistant Viticulturist in the Experiment Station, Davis.
- EDWARD E. WILSON, Ph.D., Associate Professor of Plant Pathology and Plant Pathologist in the Experiment Station, Davis.
- EUGENE S. WILSON, B.S., Associate Supervisor of Physical Education, Davis.
- JAMES F. WILSON, M.A., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station, Davis.

- ALBERT J. WINKLER, Ph.D., Professor of Viticulture and Viticulturist in the Experiment Station, Davis.
- ALAN W. WOODROW, Ph.D., Associate in the Experiment Station (Entomology), Davis.
- JOHN H. WOOLSEY, M.D., Director of Student Health Service, Surgeon, and Associate Clinical Professor of Surgery, Davis.
- ROY WRAY, Associate in the Experiment Station (Irrigation), Davis.
- CELESTE TURNER WRIGHT, Ph.D., Associate Professor of English and Assistant Editor in the Experiment Station, Davis.
- CECIL E. YARWOOD, Ph.D., Associate Professor of Plant Pathology and Associate Plant Pathologist in the Experiment Station.
- HERBERT A. YOUNG, Ph.D., Professor of Chemistry and Chemist in the Experiment Station, Davis.
- GEORGE A. ZENTMYER, JR., Ph.D., Assistant Plant Pathologist in the Experiment Station, Riverside.

AGRICULTURAL EXTENSION SERVICE STAFF

RESIDENT STAFF

- B. H. CROCHERON, M.S.A., Director of Agricultural Extension, Professor of Agricultural Extension, and Agricultural Economist on the Giannini Foundation.
- GEORGE B. ALCORN, M.S., Specialist in Agricultural Extension and Associate on the Giannini Foundation (Marketing).
- PAUL C. BARKER, B.S., Specialist in Agricultural Extension (Assistant State Leader, Clubs).
- R. S. BASKETT, B.S., Specialist in Agricultural Extension and Itinerant Assistant Farm Advisor.
- D. T. BATCHELDER, B.S.A., Specialist in Agricultural Extension (Dairying).
- KATHARINE E. BENNITT, M.A., Specialist in Agricultural Extension (Assistant State Home Demonstration Leader).
- R. A. BRENDLER, B.S., Assistant in Agricultural Extension and Itinerant Assistant Farm Advisor.
- LLOYD N. BROWN, B.S., Specialist in Agricultural Extension (Soil Conservation).
- B. B. BURLINGAME, M.S., Specialist in Agricultural Extension (Farm Management) and Associate on the Giannini Foundation.
- H. M. BUTTERFIELD, M.S., Specialist in Agricultural Extension.
- C. VERNER CARLSON, B.S., Specialist in Agricultural Extension.
- JESSIE-LEE F. DECKER, Specialist in Agricultural Extension (Home Furnishings).
- ETHELWYN M. DODSON, B.S., Specialist in Agricultural Extension (Clothing).
- HARRIET G. EDDY, A.B., Assistant Professor of Agricultural Extension, Emeritus.
- C. F. ELWOOD, B.S., Assistant Professor of Agricultural Extension (in charge of Public Service Office).
- F. H. EENST, B.S., Specialist in Agricultural Extension (Illustrative Materials).
- IRENE FAGIN, Ph.B., Specialist in Agricultural Extension (Assistant State Home Demonstration Leader).
- HILDA FAUST, M.A., Specialist in Agricultural Extension (Nutrition).
- L. W. FLUHARTY, B.S., Specialist in Agricultural Extension, and Associate on the Giannini Foundation (Farm Management).
- G. E. GORDON, B.S., Specialist in Agricultural Extension (Dairying).
- R. F. GRAH, M.S., Specialist in Agricultural Extension (Forestry).
- J. C. JOHNSTON, B.S., Specialist in Agricultural Extension (Citriculture), Riverside.
- B. J. JONES, B.S., Assistant Professor of Agricultural Extension (Agronomy).
- K. G. MCKAY, D.V.M., Specialist in Agricultural Extension (Veterinary Science).
- W. G. MABERS, B.S., Specialist in Agricultural Extension (Assistant State Leader, Clubs).
- W. E. MARTIN, Ph.D., Specialist in Agricultural Extension (Soils).
- T. C. MAYHEW, B.S., Specialist in Agricultural Extension (Assistant State Leader, Farm Advisors).
- WOODBRIE METCALF, M.S., Specialist in Agricultural Extension and Associate Professor of Forestry (Forestry).
- MILTON D. MILLER, B.S., Specialist in Agricultural Extension (Agronomy), Davis.
- P. A. MINGES, Ph.D., Specialist in Agricultural Extension (Truck Crops), Davis.

- (Mrs.) VERA D. GREAVES MRAK, Ph.D., Specialist in Agricultural Extension (Nutrition).
 S. D. NELSON, B.S., Specialist in Animal Husbandry (Animal Husbandry).
 W. E. NEWLON, B.S., Specialist in Agricultural Extension (Poultry).
 CHARBEL NYE, M.A., Specialist in Agricultural Extension (State Home Demonstration Leader).
 W. R. RALSTON, B.S., Specialist in Agricultural Extension (Assistant State Leader, Farm Advisors).
 C. W. RUBEL, B.S.A., Associate Professor of Agricultural Extension (Assistant State Leader, Farm Advisors).
 AMELIA G. SANSOM, M.S., Specialist in Agricultural Extension (Assistant State Home Demonstration Leader).
 W. R. SCHOONOVER, M.S., Specialist in Agricultural Extension (Soils).
 C. EMLIN SCOTT, M.A., Specialist in Agricultural Extension (Plant Pathology).
 MAY L. SECREST, B.S., Assistant Professor of Agricultural Extension, Emeritus.
 E. F. SEEB, JR., B.S., Specialist in Agricultural Extension (Deciduous Fruits), Davis.
 V. M. SHEPARD, B.S., Specialist in Agricultural Extension (Animal Husbandry).
 A. SHULTIS, M.S., Specialist in Agricultural Extension (Farm Management), and Associate on the Giannini Foundation.
 A. MCCALL SMITH, Specialist in Agricultural Extension (Information).
 FLEDA E. SMITH, B.S., Specialist in Agricultural Extension, Emeritus.
 L. B. SMITH, B.S., Assistant Professor of Agricultural Extension, Emeritus.
 F. M. SPURRIER, B.S., Specialist in Agricultural Extension (Assistant State Leader, Clubs).
 WALLACE SULLIVAN, M.S., Specialist in Agricultural Extension (Farm Management) and Associate on the Giannini Foundation.
 J. E. TIPPETT, B.S., Specialist in Agricultural Extension (Assistant State Leader, Farm Advisors).
 W. G. WATERHOUSE, B.S., Specialist in Agricultural Extension (Assistant State Leader, Young Extension Coöperators).
 R. F. WILLIAMS, B.S., Assistant in Agricultural Extension, and Itinerant Assistant Farm Advisor.
 (Mrs.) MARGUERITE WURTSBAUGH, A.B., Specialist in Agricultural Extension (Home Demonstration Agent-at-Large).

STAFF OF FARM ADVISORS, ASSISTANT FARM ADVISORS, HOME DEMONSTRATION AGENTS, AND ASSISTANT HOME DEMONSTRATION AGENTS

Arranged by counties in California

Prospective students may go to these officers at the addresses indicated for information about the College of Agriculture.

Alameda—Post Office Building, Hayward

- T. O. MORRISON, B.S., Specialist in Agricultural Extension.
 PETER T. MEYERS, B.Sc.A., Specialist in Agricultural Extension.
 (Mrs.) MARYETTA W. HOLMAN, B.S., Specialist in Agricultural Extension.

Butte—Federal Building, Oroville

- H. P. EVERETT, B.S., Specialist in Agricultural Extension.
 E. F. AZEVEDO, B.S., Specialist in Agricultural Extension.
 R. M. MONK, M.S., Specialist in Agricultural Extension.
 *S. V. WALTON, JR., B.S., Specialist in Agricultural Extension.
 A. W. MITCHELL, B.S., Specialist in Agricultural Extension.
 WINIFRED A. KOWALLIS, M.A., Specialist in Agricultural Extension.

Colusa—Federal Building, Colusa

- J. N. FISKE, M.S., Specialist in Agricultural Extension.
 GWEN EDWARDS, M.S., Specialist in Agricultural Extension.

Contra Costa—Hall of Records, Martinez

- R. E. GOBLE, B.S., Specialist in Agricultural Extension.
 J. C. BORDEN, B.S., Specialist in Agricultural Extension.
 HELEN A. BURLING, M.S., Specialist in Agricultural Extension.

* Absent on war leave.

- Eldorado**—Post Office Building, Placerville
I. W. LILLEY, B.S., Specialist in Agricultural Extension.
- Fresno**—Room 20, Federal Building, Fresno 1
N. D. HUDSON, B.S., Specialist in Agricultural Extension.
J. L. QUAIL, B.S., Specialist in Agricultural Extension.
R. C. CROUCH, B.S., Specialist in Agricultural Extension.
E. E. SAUNDERS, M.S., Specialist in Agricultural Extension.
L. C. BENSON, B.S., Specialist in Agricultural Extension.
GERTRUDE L. LAUCHÉ, B.S., Specialist in Agricultural Extension.
(Mrs.) RUBY A. BRYANT GRAVES, B.S., Specialist in Agricultural Extension.
- Humboldt**—Post Office Building, Eureka
W. D. PINE, B.S., Specialist in Agricultural Extension.
H. B. TUCKER, B.S.A., Specialist in Agricultural Extension.
- Imperial**—Court House, El Centro
G. L. WINRIGHT, M.S., Specialist in Agricultural Extension.
H. L. LANDERMAN, B.S., Specialist in Agricultural Extension.
J. E. SWIFT, B.S., Assistant in Agricultural Extension.
FLORENCE GLENN, M.S., Specialist in Agricultural Extension.
- Kern**—2610 M. Street, Bakersfield
M. A. LINDSAY, B.S., Specialist in Agricultural Extension.
H. T. STRONG, B.S., Specialist in Agricultural Extension.
R. V. PARKER, B.S., Assistant in Agricultural Extension.
J. D. AXTELL, M.S., Specialist in Agricultural Extension.
DOROTHY WILKINSON, B.L., Specialist in Agricultural Extension.
MARGARET A. COLE, A.B., Specialist in Agricultural Extension.
- Kings**—181 E. 8th St., Hanford
H. R. KELLER, B.S., Specialist in Agricultural Extension.
H. S. ETCHEGARAY, B.S., Specialist in Agricultural Extension.
R. L. HOLTZCLAW, B.S., Specialist in Agricultural Extension.
CHRISTINE H. PUTNAM, M.A., Specialist in Agricultural Extension.
- Lake**—Kelseyville
N. W. STICE, B.S., Specialist in Agricultural Extension.
- Lassen**—Memorial Building, Susanville
T. S. BROWN, B.S., Specialist in Agricultural Extension.
ALTON YOUNG, M.S., Specialist in Agricultural Extension.
- Los Angeles**—808 N. Spring St., Los Angeles 12
C. V. CASTLE, B.S., Specialist in Agricultural Extension.
M. H. KIMBALL, B.S., Specialist in Agricultural Extension.
H. W. SCHWALM, B.S., Specialist in Agricultural Extension.
K. M. SMOYER, B.S., Specialist in Agricultural Extension.
L. D. SANBORN, B.S., Specialist in Agricultural Extension.
EARL MAHARG, B.S.A., Specialist in Agricultural Extension.
R. W. PALMER, B.S., Specialist in Agricultural Extension.
B. E. YABICK, B.S., Specialist in Agricultural Extension.
D. L. LIDDLE, B.S., Assistant in Agricultural Extension.
(Mrs.) MARGARET TODT, B.S., Specialist in Agricultural Extension.
(Mrs.) EVELYN REBER SAUNDERS, B.S., Specialist in Agricultural Extension.
- Madera**—Post Office Building, Madera
E. L. GARTHWAITE, B.S., Specialist in Agricultural Extension.
N. B. COREYELL, B.S., Specialist in Agricultural Extension.
- Marin**—Post Office Building, San Rafael
M. B. BOISSEVAIN, B.S., Specialist in Agricultural Extension.
- Mendocino**—362 North State St., Ukiah
R. D. FOOTE, B.S., Specialist in Agricultural Extension.
C. A. SMITH, B.S., Specialist in Agricultural Extension.

Merced—County Adobe Building, Merced

W. H. ALISON, JR., B.S., Specialist in Agricultural Extension.
 S. N. JACKSON, B.S., Specialist in Agricultural Extension.
 A. ROBERT BROWN, B.S., Specialist in Agricultural Extension.
 D. R. KETCHAM, B.S., Specialist in Agricultural Extension.
 FREDA BEBEE, B.S., Specialist in Agricultural Extension.

Modoc—Court House, Alturas

J. O. HAYS, B.S.A., Specialist in Agricultural Extension.
 ELIZABETH C. WALTERS, B.S., Specialist in Agricultural Extension.

Monterey—Court House, Salinas

A. A. TAVERNETTI, B.S., Specialist in Agricultural Extension.
 REUBEN ALBAUGH, B.S., Specialist in Agricultural Extension.
 W. W. MITCHELL, B.S., Specialist in Agricultural Extension.
 OLIANNA OLSON, B.S., Specialist in Agricultural Extension.
 MARGARET H. PRAUSA, B.S., Assistant in Agricultural Extension.

Napa—Post Office Building, Napa

H. J. BAADÉ, B.S., Assistant Professor of Agricultural Extension.
 KEITH BISSELL, M.S., Specialist in Agricultural Extension.
 RUBY J. FLOWERS, M.A., Specialist in Agricultural Extension.

Nevada—Memorial Building, Grass Valley

W. H. BROOKS, B.S., Specialist in Agricultural Extension.

Orange—220 Ramona Building, Santa Ana

H. E. WAHLBERG, B.S., Specialist in Agricultural Extension.
 W. M. COBY, B.S., Specialist in Agricultural Extension.
 H. W. LONGFELLOW, A.B., Specialist in Agricultural Extension.
 FRANCES L. LILES, Specialist in Agricultural Extension.
 (Mrs.) MABEL C. STONE, B.S., Assistant in Agricultural Extension.

Placer—135 Court Street, Auburn

H. E. CATLIN, A.B., Specialist in Agricultural Extension.
 JANE HODGES, A.B., Specialist in Agricultural Extension.

Riverside—Post Office Building, Riverside

N. L. MCFARLANE, B.S., Specialist in Agricultural Extension.
 H. B. RICHARDSON, B.S., Specialist in Agricultural Extension.
 L. P. SHARP, M.S., Specialist in Agricultural Extension.
 (Mrs.) LAURA L. J. MANTONYA, M.A., Specialist in Agricultural Extension.
 (Mrs.) EMILY PARKER, B.S., Assistant in Agricultural Extension.

Sacramento—315 Federal Building, Sacramento 2

E. L. STANLEY, B.S., Specialist in Agricultural Extension.
 J. E. SPURLOOK, B.S., Specialist in Agricultural Extension.
 J. T. PETERSON, M.A., Specialist in Agricultural Extension.
 R. C. GEIBERGER, B.S., Specialist in Agricultural Extension.
 RUBY E. BEERS, B.S., Specialist in Agricultural Extension.

San Benito—Court House, Hollister

R. D. MCCALLUM, B.S., Specialist in Agricultural Extension.
 P. S. PATTENGALE, B.S., Specialist in Agricultural Extension.
 EDNA M. LANGSETH, B.S., Assistant in Agricultural Extension.

San Bernardino—Federal Building, San Bernardino

H. J. WILDER, A.B., Farm Advisor, Emeritus.
 A. G. SALTER, B.S.A., Specialist in Agricultural Extension.
 A. L. CAMPBELL, B.S., Specialist in Agricultural Extension.
 J. P. HERTEL, B.S., Specialist in Agricultural Extension.
 R. G. LARUE, B.S., Specialist in Agricultural Extension.
 P. M. PRESCOTT, B.S., Assistant in Agricultural Extension.
 (Mrs.) SARA S. MOTT, M.S., Specialist in Agricultural Extension.
 ANNABELLE O. BRAKKE, B.S., Assistant in Agricultural Extension.

- San Diego*—404 U. S. Customs Building, San Diego 1
 J. C. MILLER, B.S.A., Specialist in Agricultural Extension.
 F. W. DORMAN, B.S., Specialist in Agricultural Extension.
 B. J. HALL, B.S., Specialist in Agricultural Extension.
 D. H. CLOSE, B.S., Specialist in Agricultural Extension.
 J. J. COONY, B.S., Assistant in Agricultural Extension.
 (Mrs.) DELPHINE E. DAWSON WILSON, B.S., Specialist in Agricultural Extension.
 RUTH M. STRONG, B.S., Assistant in Agricultural Extension.
- San Joaquin*—145 South American Street, Stockton 7
 W. C. FLEMING, B.S., Specialist in Agricultural Extension.
 C. H. SWANSON, B.S., Specialist in Agricultural Extension.
 H. L. MILLER, B.S., Specialist in Agricultural Extension.
 D. L. DIETER, B.S., Specialist in Agricultural Extension.
 J. P. UNDERHILL, B.S., Specialist in Agricultural Extension.
 (Mrs.) RUTH V. SCHUMACHER, M.A., Specialist in Agricultural Extension.
- San Luis Obispo*—Post Office Building, San Luis Obispo
 PARKER TALBOT, B.S., Assistant Professor of Agricultural Extension.
 P. C. BERRYMAN, JR., B.S., Specialist in Agricultural Extension.
 R. L. CREW, B.S., Specialist in Agricultural Extension.
 ELSIE HEWITT, A.B., Specialist in Agricultural Extension.
- San Mateo*—Half Moon Bay
 J. J. MCNAMARA, B.S., Specialist in Agricultural Extension.
- Santa Barbara*—Federal Building, Santa Barbara
 S. A. ANDERSON, B.S., Specialist in Agricultural Extension.
 E. F. SMYTH, B.S., Specialist in Agricultural Extension.
 F. ARNOLD WHITE, B.S., Specialist in Agricultural Extension.
 K. G. BAGHOTT, B.S., Specialist in Agricultural Extension.
 FLORENCE SPAULDING, B.Ed., Specialist in Agricultural Extension.
- Santa Clara*—201 Post Office Building, San Jose 18.
 L. C. BARNARD, B.S., Specialist in Agricultural Extension.
 M. S. BECKLEY, B.S., Specialist in Agricultural Extension.
 G. D. WORSWICK, Specialist in Agricultural Extension.
 (Mrs.) WINIFRED JACKER, B.S., Specialist in Agricultural Extension.
- Santa Cruz*—Court House Annex, Santa Cruz
 HENRY L. WASHBURN, B.S., Specialist in Agricultural Extension.
 H. B. FINCHER, B.S., Specialist in Agricultural Extension.
 HELEN L. EDWARDS, B.S., Specialist in Agricultural Extension.
- Shasta*—County Office Building, Redding
 L. J. BERRY, B.S., Specialist in Agricultural Extension.
 D. A. PETERSEN, M.S., Assistant in Agricultural Extension.
 (Mrs.) MAXINE W. OTTEN, M.S., Assistant in Agricultural Extension.
- Siskiyou*—Court House, Yreka
 M. V. MAXWELL, B.S., Specialist in Agricultural Extension.
 (Mrs.) ESTELLE LAIR GREENE, B.S., Specialist in Agricultural Extension.
- Solano*—County Library Building, Fairfield
 V. W. DETAR, B.S., Specialist in Agricultural Extension.
 ROBERT ROGERS, B.S., Specialist in Agricultural Extension.
 E. F. NOURSE, B.S., Assistant in Agricultural Extension.
 MAYBELL S. EAGER, M.A., Specialist in Agricultural Extension.
- Sonoma*—Court House, Santa Rosa
 H. A. WEINLAND, B.S., Assistant Professor of Agricultural Extension.
 ENOCH TORPEN, B.S., Specialist in Agricultural Extension.
 G. E. STANLEY, B.S., Specialist in Agricultural Extension.
 LUOY ALLEN, B.A., Specialist in Agricultural Extension.

Stanislaus—Federal Building, Modesto

- A. A. JUNGERMAN, M.S., Specialist in Agricultural Extension.
 A. G. VOLZ, B.S., Specialist in Agricultural Extension.
 G. A. CROSS, B.S., Specialist in Agricultural Extension.
 V. P. OSTERLI, B.S., Specialist in Agricultural Extension.
 E. E. STEVENSON, B.S., Specialist in Agricultural Extension.
 A. P. MCKINSTRY, M.A., Specialist in Agricultural Extension.
 (Mrs.) DOROTHY S. SCHREINER, M.S., Specialist in Agricultural Extension.
 EVELYN H. KAISER, B.A., Assistant in Agricultural Extension.

Sutter—Post Office Building, Yuba City

- R. H. KLAMT, M.S., Specialist in Agricultural Extension.
 H. I. GRAESE, B.S., Specialist in Agricultural Extension.
 (Mrs.) EVELYN L. MAROH, M.S., Specialist in Agricultural Extension.

Tehama—Federal Building, Red Bluff

- D. M. SMITH, B.S., Specialist in Agricultural Extension.
 *D. M. WILLIAMS, JR., B.S., Specialist in Agricultural Extension.
 H. S. HINKLEY, M.S., Specialist in Agricultural Extension.
 (Mrs.) EDNA A. BLACK DRUMM, Specialist in Agricultural Extension.

Tulare—Post Office Building, Visalia

- W. E. GILFILLAN, B.S., Specialist in Agricultural Extension.
 E. C. MOORE, B.S., Specialist in Agricultural Extension.
 *C. L. PELISSIER, B.S., Specialist in Agricultural Extension.
 R. L. WORRELL, B.S., Specialist in Agricultural Extension.
 A. D. RIZZI, B.S., Specialist in Agricultural Extension.
 R. H. ANDERSON, B.S., Assistant in Agricultural Extension.
 J. A. EMO, B.S., Specialist in Agricultural Extension.
 CLARA E. COWGILL, M.S., Specialist in Agricultural Extension.
 THERESA M. VAENEY, M.S., Assistant in Agricultural Extension.

Ventura—52 N. California Street, Ventura

- O. C. DELPHEY, B.S., Specialist in Agricultural Extension.
 H. L. HALL, B.S., Specialist in Agricultural Extension.
 A. H. HOLLAND, B.S., Specialist in Agricultural Extension.

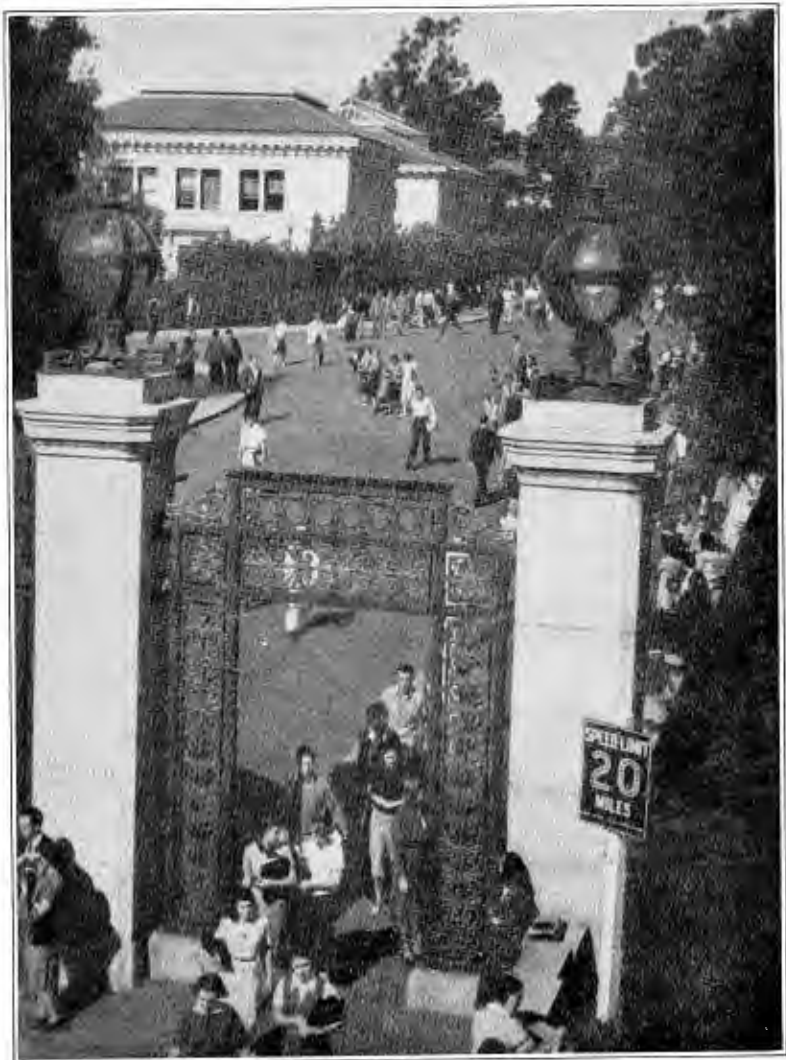
Yolo—Court House, Woodland

- W. D. NORTON, B.S., Specialist in Agricultural Extension.
 WILLIAM M. HERMS, B.S., Specialist in Agricultural Extension.
 DAVID M. HOLMBERG, B.S., Specialist in Agricultural Extension.
 B. W. RAMSAUR, JR., B.S., Specialist in Agricultural Extension.
 JEAN MCULEW, M.A., Specialist in Agricultural Extension.

Yuba—Federal Building, Marysville

- M. D. COLLINS, B.S., Specialist in Agricultural Extension.
 LEMUEL OSBORNE, JR., B.S., Specialist in Agricultural Extension.
 TUNIA M. VANDENBOUT, A.B., Specialist in Agricultural Extension.

* Absent on war leave.



SATHER GATE: ENTRANCE TO THE BERKELEY CAMPUS

UNIVERSITY OF CALIFORNIA

THE COLLEGE OF AGRICULTURE

THE COLLEGE OF AGRICULTURE includes the academic departments of Agriculture, Forestry, Home Economics, and Veterinary Science; the Agricultural Experiment Station and the Agricultural Extension Service. Its activities are conducted at Berkeley, Davis, Los Angeles, and Riverside, with extension offices and staffs in forty-four counties of the State.

Instruction, leading to the degree of Bachelor of Science, is offered by the College in coöperation with other departments of the University. The student's curriculum or major subject may determine his place of registration, particularly during the last two years; otherwise, residence is optional. The same requirements for admission and for the bachelor's degree apply at all centers of instruction. At Davis instruction in the Two-Year Curricula in Agriculture also is provided for persons who wish to obtain, in a comparatively short time, information about California agriculture but who do not desire or are not qualified to take the regular four-year degree program of study.

BERKELEY CAMPUS

The headquarters of the College of Agriculture are at Berkeley. Here also are the headquarters of the departments of Agriculture, Forestry, and Home Economics, and of nine of the Department of Agriculture Divisions—agricultural economics, entomology and parasitology, food technology, genetics, landscape design, plant pathology, poultry husbandry, soils, and veterinary science. Several of these divisions have equal or additional facilities at Davis. Some Davis divisions likewise give courses at Berkeley.

The agriculture student at Berkeley is offered many opportunities. In addition to studies in agriculture, several hundred courses in other departments and colleges of the University are open to him, if he is properly prepared. A notable collection of publications on rural and agricultural education is available in the University Library, and the proximity of the campus to the metropolitan centers of San Francisco and Oakland is decidedly advantageous.

San Francisco, which may be reached from Berkeley by electric train within thirty minutes or by automobile via the San Francisco-Oakland Bay Bridge in twenty minutes, is an excellent laboratory for research in agricultural economics not only because of its extensive foreign commerce but also because of the large amounts of food transported to it from near-by agricultural sections. Many establishments dealing in agricultural products, such as canning and preserving factories, slaughter houses, and dairy manufacturing plants, are situated in Berkeley and the vicinity.

The University owns both pasture and wooded areas, and several small tracts of land which are used for instruction and Experiment Station work.

The activities of the College are carried on in Agriculture Hall, Hilgard Hall, Giannini Hall, the Life Sciences Building, and the buildings housing the divisions of poultry husbandry and veterinary science. Fourteen greenhouses, and eleven headhouses are available for research and undergraduate and graduate instruction.

The Berkeley campus of the University, situated on sloping hills overlooking San Francisco Bay and directly opposite the Golden Gate, comprises about five hundred and thirty acres. The climate, without extremes of temperature, is well suited for university work throughout the year.

Descriptions of courses offered in Berkeley will be found on pages 83-103.

DAVIS CAMPUS

The College of Agriculture at Davis is in Yolo County, thirteen miles west of Sacramento and about sixty-seven miles northeast of Berkeley. The original University Farm, which now comprises 1,625 acres, was purchased in 1906, and instruction there was begun two years later. The soil and climate are typical of any interior valley of California, and the crops are those grown in most parts of the State. Wells equipped with various types of deep-well pumps supply water, which is distributed over the fields and experimental plots by a modern concrete-pipe irrigation system. Gravity water also is available from the Clear Lake Water Company.

The University Farm has ample facilities for practical and technical instruction in the various phases of agriculture and home economics. It is equipped with buildings and laboratories, an apiary, a dairy, a creamery, five large greenhouses, shops, barns, student orchards, vineyards, and vegetable plantings, devices for measuring irrigation water, an up-to-date collection of agricultural tools and implements, and herds and flocks of the principal breeds of cattle, sheep, hogs, horses, and poultry. Adjacent livestock farms, vineyards, orchards, and diversified farms offer additional opportunities for study, demonstration, and judging.

The Animal Science, Chemistry, Dairy Industry, Gymnasium, Horticulture, Irrigation Laboratory, Enology, Library and Administration, Agronomy Seed House, and Agricultural Engineering buildings are modern concrete structures, designed for research and instructional purposes. The following divisions have fields and laboratories at Davis: agricultural engineering, agronomy, animal husbandry, botany, chemistry, dairy industry, entomology and parasitology, home economics, decorative art, irrigation, landscape gardening, plant pathology, pomology, poultry husbandry, soil science, truck crops, veterinary science, viticulture, and zoölogy. The divisions of agricultural economics, agricultural education, geology, history, languages and literature (including English and public speaking, French, German, and Spanish), mathematics and

physics, military science, physical education, physiology, and psychology also offer work at Davis.

Descriptions of all courses offered on the Davis campus are given on pages 107-132.

LOS ANGELES CAMPUS

The Los Angeles campus is the center for instructional work in general horticulture, as it relates to subtropical fruits, ornamental plant materials, and flower crops. The laboratory and classroom facilities are mainly in the north wing of the Physics-Biology Building. These facilities are modern and effective and include a controlled environment installation for physiological and storage studies consisting of four large chambers.

Forty-six acres have been allocated to the College of Agriculture on the Los Angeles campus consisting of the 16-acre subtropical horticulture area and the 30-acre ornamental horticulture area. The latter was provided for the purpose of developing research and instruction in floriculture and ornamental horticulture. On the subtropical horticulture area there has been developed a unique and excellent laboratory orchard, consisting of collections and demonstrations involving many kinds of fruits, and a small nursery. Small plantings have also been made for investigational purposes. Two greenhouses and a lath house and complete facilities for instruction and research in plant propagation have also been provided on this area.

The ornamental horticulture area is being developed as rapidly as practicable. Floriculture plantings for research purposes have already been established and glasshouses and headhouses for research in floriculture and ornamental horticulture, including entomology and plant pathology, have recently been constructed.

Horticulture is, at present, the only major in agriculture that can be completed in its entirety on the Los Angeles campus, and has recently been expanded to include courses in floriculture and ornamental horticulture. There are, however, supporting courses available on this campus, such as entomology, irrigation, soil science, plant pathology, and agricultural economics, as well as all the basic courses which are required in the several agricultural curricula offered by other departments of the University. This makes it possible for a student whose major is given either at Berkeley or Davis to enroll for at least one and in most instances two years at Los Angeles before transferring for his major work. *Because of excellent opportunities for practice teaching in the Los Angeles area, this is a most suitable place to prepare for a teaching credential in agriculture.*

Descriptions of the course offerings at Los Angeles will be found on pages 135-139 of this prospectus.

RIVERSIDE CAMPUS

By legislative enactment, the Citrus Experiment Station of the College of Agriculture, as it now exists, was created at Riverside in 1913, and an outstanding center of research in subtropical agriculture has been developed there. Available on the 751 acres of this campus, of which more than 300 are given over to orchard and nursery plantings, are splendid facilities, including a library, laboratories, a modern insectary, greenhouses and lath houses, and an orchard tree lysimeter installation.

Early in its history graduate instruction was instituted, which at present is confined to doctorate students who have satisfied all course requirements and have left for completion only their research problems. The courses available, therefore, are limited to seminars and graduate research. Descriptions of the courses offered at Riverside will be found on page 143 of this prospectus.

BLODGETT FOREST

Blodgett Forest, which was given to the University in 1933 by the Michigan-California Lumber Company, is a tract of 2600 acres in the Sierra of Eldorado County, the heart of the optimum sugar-pine region. The forest has about 1900 acres of second-growth timber, and it is used for field research by the faculty and graduate students of the department of forestry. Living quarters and a small office building have been erected there.

THE AGRICULTURAL EXPERIMENT STATION

The research program in agriculture for the state of California is the responsibility of the Agricultural Experiment Station, an integral part of the College of Agriculture of the University of California. The work is supported jointly by Federal and State funds. Most of the teaching staff of the College hold Experiment Station titles and their research work constitutes the projects of the Experiment Station. Facilities and personnel of the station are distributed on all four campuses of the college and at numerous other points throughout the State such as the Meloland Station in Imperial Valley, the Deciduous Fruit Station at San Jose, and the Blodgett Forest in Eldorado County.

AGRICULTURAL EXTENSION SERVICE

The Agricultural Extension Service extends to the farmers of California the results of the researches of the Experiment Station and the United States Department of Agriculture. Farm Advisors are established in forty-four counties of the State* and Home demonstration agents are at work in thirty-six counties. 4-H clubs are organized among the younger people in many localities. Thus farmers may come into direct touch with the College of Agriculture through its own representatives. The Agricultural Extension Service also con-

* The list of Farm Advisors, by counties, is given on pages 20-25.

ducts a limited number of extension schools in coöperation with the divisions of the College.

By these methods, the College attempts to supply the people of California with the best scientific and practical agricultural information.

OPPORTUNITIES IN AGRICULTURE

California is so predominantly agricultural that it is difficult to name many fields of business or industrial activity for which some knowledge of agriculture would not prove highly desirable.

For those who contemplate a business career in industries allied to agriculture, the curriculum in agricultural economics offers a promising field.

Many of the technical agricultural fields, such as landscape design, entomology, plant pathology, forestry, soil science, and agricultural education, require at least an undergraduate training such as that offered in the University as a basic qualification for employment in the technical fields of the profession.

Agricultural engineering requires the intensive basic engineering training equivalent to mechanical and civil engineering. The application to agriculture is extensive and varied, naturally leading the engineering graduate into many technical fields with governmental and public agencies, with manufacturers of farm implements and materials, or into mechanical agricultural production.

The production fields such as animal husbandry, poultry husbandry, agronomy, truck crops, viticulture, pomology, and subtropical horticulture—in other words, the fields of “dirt farming”—do not, of course, demand collegiate training as a prerequisite for employment or success. So many other factors, such as financial backing, experience, and personal initiative and character influence the ultimate success of any farming venture to such an extent that training, valuable though it is, is not important enough to outweigh the importance of these other factors. It has been shown repeatedly, however, that with other factors equal, the addition of University training leads to more successful and satisfying operations.

It is interesting to note in this connection that the percentage of California graduates entering the production fields upon graduation is over three times that of the national percentage of agricultural college graduates.

In addition to the fields already mentioned, there is another group comprising the majors in food technology, agricultural engineering, and dairy industry, which combine a knowledge of production problems with the mechanical or chemical phases of harvesting, processing, or preservation.

The employment record of graduates of the College of Agriculture has been exceedingly good, even through the depression. It should be emphasized, however, that a choice of professional training should not be too greatly influenced by the employment possibilities of the field. An outstanding student in any field can generally find employment no matter how crowded his profession may

be at the time of graduation. On the other hand, the average or mediocre student under the same conditions might not find his professional start so easy.

It should be borne in mind quite definitely, too, that many professional fields in agriculture offer limited opportunities for graduates of the four-year course leading to the bachelor's degree, unless the student carries on graduate work in addition, of from one to four years. Opportunities may be available but the recipients of these positions find advancement barred early in their careers, by lack of graduate training. This applies particularly to the necessity for obtaining the general secondary credential in agricultural education which requires one additional year of graduate study and the advisability of a doctor's degree in fields such as entomology, plant pathology, or soil science.

Admission to graduate work presupposes a high scholastic standing during undergraduate years, particularly in the upper division.

All courses are available to women on the same basis as to men.

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 Director of Admissions, 125 Administration Building, University of California, Berkeley 4, California, or from the Recorder, University of California, College of Agriculture, Davis, California, or from the Registrar, University of California, Los Angeles 24, California. 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.

Admission in Freshman Standing

Admission by Certificate—

A graduate of an accredited high school may enter the University of California in freshman standing provided the following conditions have been met:

1. *Graduation.* Graduation from an accredited high school usually requires the completion of sixteen matriculation units or credits in selected subjects. (See statement on page 41 regarding admission of returning veterans.)

2. *Subject requirements.* The high school program must include the following subjects, (a) to (f), inclusive, which represent the minimum subject requirements, and which must be approved by the high school principal as college preparatory courses.†

- (a) History 1 unit.—This may consist of any two semesters of history, civics, or social science.
(Effective June, 1946, 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.

* Veterans who expect to enroll under the provisions of Public Law 346 (G. I. Bill of Rights), or Public Law 16 are not required to remit this fee with their applications.

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

- (d) Science 1 unit. —This may consist of a year course in one field of science, namely, biology, botany, chemistry, physics, physical science, physiology, or zoölogy. The science selected must be an advanced (3d or 4th year) laboratory science, and the two semesters must be in the same subject field.
- (e) Foreign language 2 units.—These must be in one language.
- (f) Advanced (3d or 4th year) mathematics, or foreign language or chemistry or physics—1 unit; or two years of a second language—2 units
1 or 2 units.

3. *Scholarship requirement.* For any of these required subjects completed in the ninth grade (first year of high school), *subject credit* is given irrespective of the scholarship grade received, provided, of course, it is a passing grade. In the subjects completed in the *last three years* of the high school program, however, a scholarship *average* of grade B (based on a marking system of four passing grades: A, B, C, D) must have been maintained. In computing scholarship averages *semester* grades rather than year grades are used. For example, a semester grade A in either half of one prescribed course may be used with a semester grade C in either half of any other prescribed course to obtain a B average. Required subjects taken in the last three years of high school in which a grade D has been received will not be counted either in reckoning the required scholarship average or in satisfaction of the subject requirements. A grade earned by repeating a course, in which the original mark was not higher than C, may be counted.

Subject A: English Composition. An examination in English composition designed to test the applicant's ability to write English without gross errors in spelling, grammar, sentence structure, and punctuation, is required of all undergraduate intrants. The examination is given at the opening of each semester and at the opening of each Summer Session. Students who do not pass in the examination are required to take the Course in Subject A without unit credit toward graduation.

ADDITIONAL WAYS OF GAINING ADMISSION

The above-enumerated subjects have been selected as a central core of academic subjects for preparation for entrance to this University. It has been demonstrated that the student who completes them satisfactorily is most apt to be successful in his University work. In keeping, however, with the University's policy that no worthy student shall be denied admission, the Board of Admissions has been authorized to make certain exceptions to the general rules governing entrance for an applicant who may have subject shortages but a *superior* scholarship record. Every such applicant, upon submitting his official transcript of record, is given special consideration by the Director of Admis-

sions. In general, an applicant with superior scholarship but with subject shortages may qualify for entrance to the University of California as follows:

(1) If he ranks in the upper tenth of his class and has a substantial academic preparation, although he may have subject deficiencies.

(2) If he has 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).

(3) If he has 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.

(4) If he has 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 passes the *Examination in Subject A*; and has 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.

Removal of Admission Deficiencies

Deficiencies in the subject or scholarship requirements for admission in freshman standing by certificate may be removed in any one of the following ways:

(1) By courses in University of California Extension which offers work of high school level, and college courses (class or correspondence) which may be taken to remove entrance deficiencies. Work taken in University Extension must be performed by achieving a standard satisfactory to the Board of Admissions, and the program of studies of the students must be approved by the Director of Admissions or by one of his associates, Berkeley or Los Angeles.

(2) By courses in the University of California Summer Sessions (Berkeley and Los Angeles). Elementary college courses and a limited number of courses of high school level are offered. Advice respecting the selection of these courses should be obtained from the Director of Admissions or from one of his associates, Berkeley or Los Angeles.

(3) By courses in the College of Agriculture of the University of California at Davis (for applicants for admission to the College of Agriculture). Minor entrance deficiencies may be removed by an appropriate program made up of two-year or degree courses, or by a program combining both types of work. See under Provisions for Transfer from the Two-Year to the Four-Year Curricula, page 38.

(4) By courses in other four-year colleges completed with satisfactory grades, subject to the approval of the Director of Admissions. The requirements for admission in advanced standing must also be satisfied (see page 39).

(5) By courses in junior colleges or state colleges completed with satisfactory grades and in proper amount. In addition, all requirements for admission to the University in advanced standing must be satisfied. The high school record of an applicant for admission with advanced standing from another collegiate institution will be considered on the same basis as the high school record of a student applying for admission to freshman standing in the University, provided his college record is satisfactory. Students who make up deficiencies in this way must continue in junior college or state college long enough to make up entrance deficiencies and, in addition, complete at least fifteen units with a C plus average (1.5), or remain until completing sixty units with a C average (1.00). Students who completed the requirements in any one of the ways described on pages 33-36 will qualify for admission, provided they have at least a C average in all college work presented for advanced standing.

(6) By junior college noncertificate courses representing work of nonuniversity level taken after high school graduation. The scholarship standards for these courses are the same as those required for work taken in the high school.

(7) By postgraduate courses in accredited high schools.

(8) By College Entrance Board achievement and attainment tests.

Information Primarily for High School Principals and Faculty Advisers

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 the course to the University under the proper subject designation of the high school program.

Preparation for Curricula in Agriculture

In addition to those subjects required for admission to the University, outlined on pages 33-36, 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.

Intrants to the College of Agriculture will be seriously handicapped in undertaking the lower division courses required in the various curricula of this College unless they have completed, in addition to those subjects required for admission as outlined on page 33, the following subjects in high school: algebraic theory, $\frac{1}{2}$ unit; trigonometry, $\frac{1}{2}$ unit; physics, 1 unit; chemistry, 1 unit; and, for those proposing to major in landscape design or forestry, geometrical drawing, 1 unit.

The student is also cautioned with respect to the choice of electives that vocational or activities courses in the high school are not regarded as acceptable substitutes for basic academic studies in the preparation for University curricula. Unless this caution is observed, the student, even though he has been admitted to the University, may find that he is not equipped to do all the work necessary for the bachelor's degree in the normal four-year period.

Registration at Davis

The prospective student should plan to arrive in Davis on Thursday of registration week. Formal registration should be completed by Friday afternoon. All new students may be required to take certain tests, including the Examination in Subject A, which are scheduled for specific hours on Saturday. A fee of \$1 is charged any student who fails to take the required examination at the prescribed time.

Classification of Students at Davis

For administrative purposes undergraduate students on the Davis campus are classified into four groups on the basis of their academic preparation or their professional and vocational objectives:

GROUP I. *Four-year students seeking the bachelor's degree.* All students who have fulfilled the requirements of the University of California for entrance to four-year curricula leading to the bachelor's degree are given this classification.

GROUP II. *Students with deficiencies desirous of qualifying for admission to the four-year curricula.* This group includes high school graduates who have minor matriculation deficiencies; also transfer students from other colleges who have minor grade-point or matriculation deficiencies.

GROUP III. *Two-year students working for the Certificate of Graduation.* Only high school graduates, veterans, and *specialty qualified* students more than 18 years of age who are not high school graduates will be granted the opportunity to complete the requirements for graduation from the Two-Year Curricula in Agriculture.

GROUP IV. *Special students.* This group includes those more mature persons who cannot remain in residence for more than one or two semesters but who, because of their previous training and experience, may profit by the special opportunities afforded by the College of Agriculture at Davis. Such persons may also register as "*visitors*" and be granted special privileges for a brief period of intensive study with some member of the staff. Visitors pay a fee of \$3 for the first week and \$2 for each additional week of residence. They must have their applications endorsed by the staff member with whom they plan to study and approved by the Assistant Dean, College of Agriculture, Davis. Except for conduct, visitors are not held to the same academic regulations as regular students. They may use the Library, but are not entitled to the Student Health Service.

Provisions for Transfer from the Two-Year to the Four-Year Curricula

High school graduates who wish to undertake work leading to the bachelor's degree but who have been denied freshman standing because of matriculation or grade-point deficiencies incurred at other collegiate institutions, may enroll in the Two-Year Curricula and by the satisfactory completion of certain courses, may be formally admitted to a four-year degree curriculum.

The removal of matriculation deficiencies must be accomplished according to the regulations of the University of California Board of Admissions. When applying for admission to the College of Agriculture, every candidate must present a transcript of all high school and college work undertaken.

The method of removing deficiencies will depend entirely on their nature and number, as determined by the Director of Admissions. Each high school unit of a *matriculation deficiency* may be removed by the completion of an approved 3-unit course with a grade of C or higher. Grade-point deficiencies may be removed only by the completion of regular degree courses with grades of A or B. A student with a deficiency of more than 12 grade points is required to complete satisfactorily a minimum of 12 units in the Two-Year Curricula before he may enroll in a four-year curriculum.

Students with matriculation deficiencies may transfer to the Four-Year Curricula after removing such deficiencies, provided they have completed a minimum program (12 units) of work with a scholarship record of a C average or higher.

No student will be given repeated opportunities to remove matriculation deficiencies and, except in special instances, University admission requirements must be completed in two semesters.

Admission in Advanced Standing

An applicant for admission 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, as described on pages 33-34 (see also under Additional Ways of Gaining Admission, page 34), and that his advanced work in institutions of college standing has met the scholarship standard required of transferring students; namely, an average of grade C or higher in all courses of college level undertaken.

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

An applicant from a junior college or state college in California, who upon graduation from high school did not qualify for admission in freshman standing, must submit evidence that he has made up all entrance deficiencies and, in addition, has completed:

(a) Not less than 60 semester units of work acceptable for advanced standing in the college of the University to which admission is sought, 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.

The student should note that credit toward a degree in the University of California for an extension course or courses completed in another institution will be allowed only upon the satisfactory passing at this University of an examination in the course or courses so offered, unless the other institution maintains a classification of extension courses similar to that established by the University of California.

Subject A: English Composition. Credit for Subject A (English Composition) is given upon certificate to those students who enter the University with credentials showing the completion elsewhere of the required training in composition. Of all other students, an examination by this University, at Berkeley or at other centers of instruction, is required.

Surplus matriculation credit. There is no provision for advanced standing in the University on the basis of surplus high school credit.

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 in grade points. This may be accomplished by work in (1) the Summer Sessions, (2) University of California Extension, (3) other approved higher institutions, or (4) as a group II student on the Davis campus.

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 Director of Admissions. 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 Director of Admissions 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 other than veterans will be admitted as a special student, but the mere attainment of any given age is not in itself a qualification for admission.

An applicant will not be admitted directly from high school to the status of special student. Graduates of high schools are expected to qualify for admission in accordance with the usual 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—that is, for students who have had the equivalent of a good high school education and have been fully matriculated. 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.

Instruction is not offered in such essential preparatory subjects as elementary English, United States history, elementary physics, nor, except in the Summer Sessions* or in University Extension, in elementary algebra, plane geometry, or elementary chemistry.

Students more than 24 years of age at the time of admission and veterans are excused from military science.

* See statement concerning the Summer Sessions on page 85.

Admission of Returning Members of the Armed Forces

Returning service men and women will be welcomed to all sessions of the University; those who are ineligible for admission to *Regular Status* will be given every consideration and will be admitted to *Special Status* if they present evidence of ability to do successfully the courses of the College in which they wish to register; others will be given programs of work in University Extension or in junior colleges designed to prepare them for University work or in the Two-Year Curricula at Davis.

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 Director of Admissions 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. The names of these advisers may be obtained by applying at the office of the Dean of the Graduate Division. Every student from another country, should, upon his arrival at the University, make immediate effort to meet his adviser.

ADMISSION IN GRADUATE STANDING

Holders of bachelors' degrees (representing the usual college course of four years) from institutions on the Accepted List of the Association of American Universities will be admitted to the Graduate Division of the University of

California, Berkeley, upon presentation of credentials including a diploma or certificate of graduation, with the proviso that the University of California may deny admission to graduate status in cases where the undergraduate program has not been of such character as to provide an adequate basis for advanced work leading to academic or professional higher degrees or certificates. This applies to colleges within the University of California as well as to those outside.

Applicants for admission to graduate work at the College of Agriculture at Davis must first secure admission to the Graduate Division and authorization to pursue such work through the Dean of the Graduate Division, Northern Section. *In the absence of a diploma or other official evidence of graduation or degree, registration will not in any case be permitted.*

The Accepted List of the Association of American Universities is printed in the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION. Graduates of institutions not on this list may be admitted to the Graduate Division with the approval of the Dean of the Graduate Division if the evaluation of their certified college records by the Director of Admissions proves them eligible for graduate status. Every applicant for admission to the Graduate Division is required to pay an application fee of \$5 at the time the application is presented.* Remittance should be made payable to The Regents of the University of California.

The level of work to which graduate students are assigned, and their 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 may be admitted only after demonstrating, in the examination in English for foreign students described in the preceding section, that their command of English is sufficient to permit them to profit by instruction in this University.

For information concerning all matters pertaining to the Graduate Division at Berkeley, including the list of available fellowships and graduate scholarships, and the requirements for all higher degrees and certificates see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, to be obtained upon application to the Dean of the Graduate Division, University of California, Berkeley 4, California.

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

* Veterans who expect to enroll under the provisions of Public Law 346 (G. I. Bill of Rights), or Public Law 16 are not required to remit this fee with their applications.

LATE ADMISSION AND REGISTRATION

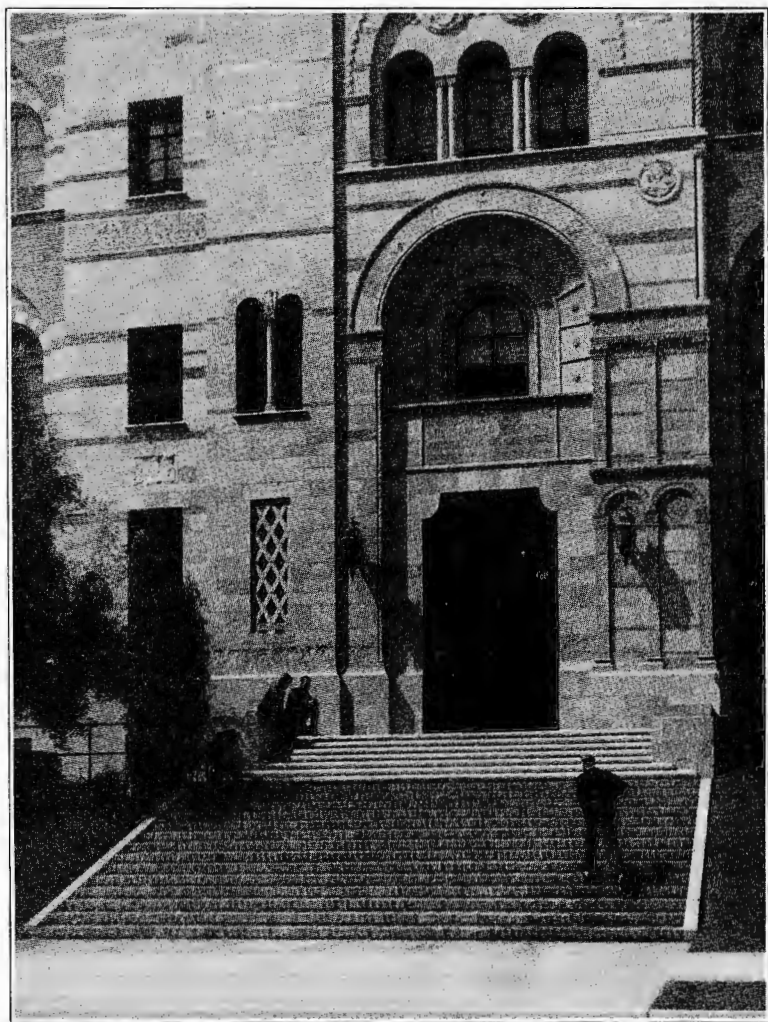
The prospective student should consult the University calendar and acquaint himself with the dates upon which students are expected to register and begin their work at the opening of the sessions. Failure to register upon the stated registration days is certain to cause difficulty in the making of a 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 in general 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. An applicant for admission *after the first two weeks* of instruction must receive the special approval of the Director of Admissions and the dean of the college to which he seeks admission. His study list must also be approved by the dean and the instructors concerned.

Late admission from other institutions. A student in another college or university who desires to enter the University of California after stated registration days should, without fail, communicate in advance with the Director of Admissions, and then, before discontinuing his studies elsewhere, await assurance that late admission will be permitted. The applicant should state specifically the college in the University of California to which admission is sought. Such permission to register after the stated registration dates requires the approval both of the Director of Admissions and the dean of the college concerned.



ENTRANCE TO THE PHYSICS-BIOLOGY BUILDING: HEADQUARTERS OF THE
COLLEGE OF AGRICULTURE AT LOS ANGELES

GENERAL REGULATIONS

COURSES OF STUDY

THE STUDENT must arrange his program of study to meet the graduation requirements of the curriculum of his choice. Approval of his program by an officer of the College does not relieve him of his responsibility.

ADVISERS

Upon their admission to the University, students are assigned to advisers. Berkeley students who have selected their majors are given major subject advisers, and others are referred to the Study Lists Committee of the Faculty. Students enrolling at Davis should consult the Registration Circular for the name and office address of their advisers. The Assistant Deans of the College act in an advisory capacity to all students.

STUDY LISTS

The study list of the lower division student must be endorsed by the Study Lists Committee of the Faculty or 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.

The upper division student may file his study list after it has been approved by his major subject adviser and the Dean, or Assistant Dean, of the College.

Students at Davis and Los Angeles must follow the printed instructions for the endorsement of study lists which are issued at the time of registration.

Study-list limits. The regular student is limited to a program of 18 units a semester, to which may be added a lower division course in physical education of one-half unit.

SCHOLARSHIP GRADES

The work of the student in every course of instruction is reported to the Registrar in one of six grades: A, excellent; B, good; C, fair; D, barely passing; E and F, not passing.

Grade points. For each unit of credit, the scholarship grade A is assigned 3 points; B, 2 points; C, 1 point; D, E, and F, no grade points.

In order to qualify for the B.S. degree, the student must obtain at least as many grade points as units of credit in all work that he undertakes at the University.

HONORS

Honorable mention in junior standing. The student who has completed 64 units in the curriculum of his choice, thereby attaining junior standing in the College, is given honorable mention if he has obtained an average of at least two grade points for each unit of credit undertaken. He remains in honor status unless his scholarship for any one semester falls below this average.

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

The list of students who have received highest honors and honors is published in the COMMENCEMENT PROGRAMME.

STUDENT HEALTH SERVICE

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

Each registered student on any of these campuses may, at need, have such consultations and medical care as the Student Health Service on the particular campus is staffed and equipped to provide, from the time of payment of his registration fee to the last day of the current semester.

Hospitalization for a limited time is provided on the Berkeley and Davis campuses on recommendation of the University physician. If illnesses are of a nature requiring long-continued care so that the student may not be returned to classes during the current semester, or if at the end of the semester the patient is still ill, he will be returned to his home or community as soon as the University physician considers it safe. Additional charges will be made for unusual appliances or remedies not ordinarily available.

The Health Service does not take responsibility for certain chronic physical defects or illnesses present at the time of entrance (as, for example, hernias, chronic bone and joint diseases or deformities, chronic gastrointestinal disorders, fibroids of the uterus, chronically infected tonsils, tuberculosis, syphilis, malignant diseases, allergic and endocrine disorders, etc.).

OTHER UNIVERSITY RULES

The student should familiarize himself with other University rules and regulations, and with the details of those which have been outlined above. This information is given in the GENERAL CATALOGUE, which may be obtained at a cost of 25 cents from the Registrar, either at Berkeley or at Los Angeles. Additional rules and procedures which apply on the Davis campus may be obtained from the Recorder, University of California, College of Agriculture, Davis, California.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE

The candidate for the degree of Bachelor of Science in the College of Agriculture must complete the following requirements:

(1) The equivalent of four years of university residence. The senior year must be spent in the College of Agriculture at this University.

The student should note that in order to complete the work in agriculture within the normal period, prerequisites must be systematically met and the proper sequence of courses followed. Unnecessary delay will thereby be avoided. It is advisable, therefore, for the student who wishes to receive his bachelor's degree in agriculture at the University of California to take as much of his undergraduate program as possible in the University.

(2) One hundred and twenty-four units of university work, with at least an equal number of grade points, in addition to matriculation units and 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.) Further regulations concerning Subject A and scholarship are given in the GENERAL CATALOGUE.

(3) Thirty-six of the 124 units must be in upper division courses (courses numbered 100-199). Not more than 4 units may be in lower division physical education courses.

(4) Nine units of mathematics, including trigonometry. Matriculation work may be offered toward this requirement, with each year of high school work valued at 3 units. The student normally satisfies this requirement before the end of his sophomore year.

(5) American History and Institutions. The student may meet this requirement by passing separate examinations in American institutions and in American history, or by completing the courses prescribed by the University. For further information concerning the Requirement of American History and Institutions, consult the GENERAL CATALOGUE.

(6) The program of study listed under one of the following curricula, in addition to the mathematics requirement stated under (4) above:

CURRICULUM IN PLANT SCIENCE

(a) Required:	<i>Units</i>
Chemistry	16
Botany and Plant Physiology	12
Physics	6
Bacteriology	4
Economics	3
English or Public Speaking	3
Genetics	4
Plant Pathology	4
Soils and/or Irrigation	6
Entomology	4
Zoölogy	3
†Military	8
	73

(b) In addition, students must complete a minimum of 12 units of upper division work in one of the following divisions, or in a closely related division, selected with the approval of the major adviser: agronomy, food technology,

† Students in the Naval Unit will substitute for 8 units of military science, 8 units of naval science and 4 units of astronomy.

genetics, irrigation, plant pathology, horticulture, subtropical horticulture* and truck crops.

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

For details and example of program, see pages 53-55.

CURRICULUM IN ANIMAL SCIENCE

(a) Required:	<i>Units</i>
Chemistry, including Biochemistry.....	16
Botany	4
Physics	6
Economics	6
Zoölogy	10
Genetics	4
Bacteriology	4
Geology or Soils.....	3
Animal Physiology	5
Animal Nutrition	3
Animal Pathology or Parasitology.....	3
English	3
†Military Science	8
	75

(b) In addition, students must complete a minimum of 12 units of upper division work in one of the following divisions, or in a closely related division, selected with the approval of the major adviser: animal husbandry, poultry husbandry, dairy industry, veterinary science and genetics. Additional requirements for animal husbandry majors are: Animal Husbandry 7, 8, and 102.

For details and example of program, see pages 57-59.

CURRICULUM IN ENTOMOLOGY AND PARASITOLOGY

(a) Required:	<i>Units</i>
Chemistry	13
Agriculture or Forestry, other than Entomology and Parasitology	12
Botany and Zoölogy	20
Bacteriology	4
Physics	3
English or Public Speaking.....	6
Genetics	3
Plant or Animal Pathology.....	6
Plant or Animal Nutrition.....	4
Plant or Animal Physiology.....	4
†Military Science	8
	83

* The Curriculum in Plant Science, with a major in subtropical horticulture, is offered on the Los Angeles campus of the University, see pages 55-56.

† Students in the Naval Unit will substitute for 8 units of military science, 8 units of naval science and 4 units of astronomy.

(b) A summer practice course (49), entomology and parasitology.

(c) In addition, at least 19 units in entomology and parasitology courses, with the approval of the major adviser, in addition to (b). Courses 1, 106, 112 and 127 should be included.

For details and example of program, see pages 59-60.

CURRICULUM IN AGRICULTURAL ECONOMICS

(a) Required:	Units
Botany, Bacteriology, Chemistry, Geology, Physics, Physiology, Zoölogy, or additional mathematics	18
Mathematics	6
English or Public Speaking	6
Business Administration or Economics	15
Anthropology, Geography, History, Philosophy, Political Science, Psychology, or Social Institutions	12
Agriculture	15
†Military Science	8
	80

(b) In addition to the above, every student must complete at least 15 units of upper division work in Agricultural Economics selected with the approval of the major adviser.

For details and example of program, see pages 60-61.

CURRICULUM IN FORESTRY

(a) Required:	Units
Botany, including Plant Physiology with laboratory	10
Chemistry, including Organic Chemistry	8
Engineering (Surveying)	6
Economics or Business Administration (other than statistics)	9
Geology	3
Mathematics (Analytic Geometry and Calculus)	6
Physics, including laboratory	8
Plant Pathology or Taxonomic Botany	3
Public Speaking or English	6
Soil Science	4
Statistics	3
Zoölogy, lower division	3
Zoölogy, upper division, or Entomology	3
†Military Science	8
	80

(b) A summer course in Forestry.

(c) In addition to the above, students must complete 30 units of forestry selected with the approval of the major adviser.

For details and example of program, see pages 61-62.

† Students in the Naval Unit will substitute for 8 units of military science, 8 units of naval science and 4 units of astronomy.

CURRICULUM IN SOIL SCIENCE

(a) Required:	<i>Units</i>
Chemistry	19
Physics, including laboratory	8
Botany, including Plant Physiology	12
Bacteriology	4
Mineralogy	3
Economics	6
Geology	3
†Military Science	8
	63

(b) In addition, at least 24 units in soil science, selected with approval of the major adviser. Courses 100, 101, 110, and 111 should be included.

(c) A summer field course, Soil Science 105, also may be prescribed as a major requirement.

For details and example of program, see pages 62-64.

CURRICULUM IN LANDSCAPE DESIGN

(a) Required:	<i>Units</i>
Botany	4 or 8
English or Public Speaking	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	6
or Agriculture (other than Landscape Design)	6
†Military Science	8
	66 or 70

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

(c) In addition, at least 30 units of courses in the division of landscape design, with the approval of the major adviser.

For details and example of program, see pages 64-65.

CURRICULUM IN AGRICULTURAL EDUCATION (GENERAL AGRICULTURE)

(a) Required:	<i>Units</i>
Chemistry	13
Physics	6
Botany	8
Zoölogy	5
Bacteriology	4
Soil Science	3
Genetics	4
Economics	6
English	3
†Military Science	8
	60

† Students in the Naval Unit will substitute for 8 units of military science, 8 units of naval science and 4 units of astronomy.

(b) In addition, students must complete 50 units of work selected with the approval of the major adviser and distributed in the fields of animal science, plant science, agricultural engineering, and agricultural economics.

For details and example of program, see pages 65-66.

CURRICULUM IN HOME ECONOMICS

(a) Required:	Units
Chemistry	5
Economics	6
Psychology	3
Bacteriology	4
Public Health and Physiology.....	6
English, History or Public Speaking.....	6
	30

Other lower division requirements for the General Home Economics major are: Home Economics 1A-1B, 5, 7; Decorative Art 16A-16B; Chemistry 8; and Economics 40 or Psychology 5.

(b) In addition, 36 units of upper division work distributed among the allied fields of home economics and chosen with the approval of the major adviser.

The following upper division courses should be included:

General Home Economics Major: Home Economics 140, 141 (or 142), 162, 167, 132 (or Psychology 112), 133, 144, 102A, 102B; Civil Engineering 125; Decorative Art 130A.

Nutrition and Dietetics Major: Home Economics 100, 101A, 106, 120A, 120B, 141 (or Agricultural Economics 101A or Business Administration 123), 196; Biochemistry 103.

Food Chemistry and Technology Major: Home Economics 100, 101A, 101B (or 125), 120A, 120B, 141 (or Agricultural Economics 101A or Business Administration 123), 106; Biochemistry 103; four units of Food Technology courses.

Household Economics Major: Home Economics 100, 140, 141, 142, 144 and 162; nine units of economics selected upon consultation with the adviser.

Clothing and Textiles Major: Consult the major adviser.

Child Development Major: Home Economics 132 (or Psychology 112), 133, 134, 135, 435, 102A, 102B, Psychology 160, 162.

CURRICULUM IN AGRICULTURAL ENGINEERING

See pages 67-69 of this prospectus, and also the description of the College of Engineering in the GENERAL CATALOGUE, Departments at Berkeley.

ELECTIVES

The student should note that each curriculum prescribes a group of fundamental sciences which are necessary for a thorough understanding of the major work. These courses should be completed as early as possible. The student who

does not wish to take as many science units in his first two years as are indicated in the example of program under his curriculum, may, at Berkeley and especially at Davis, include more agricultural courses in his lower division program, and take some of the sciences and other required subjects not prerequisites to later courses during his junior and senior year. Nearly every division of the College offers courses which the student, irrespective of his major, may elect in any semester of his undergraduate course. He should consult his major subject adviser on the choice of these electives in order to obtain the best possible preparation for his future work.

Students intending to utilize their training in the College of Agriculture as preparation for teaching high school vocational agriculture should consult, as early in their course as possible, the Supervisor of Agricultural Teacher Training at Davis concerning the proper selection of electives.

The student has from 22 to 35 units, depending on the curriculum of his choice, which are entirely elective. A wise selection of courses in agriculture and other fields will give him a broad university training.

CURRICULA IN AGRICULTURE LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

PLANT SCIENCE*

FOR DEGREE requirements, see pages 47-48.

EXAMPLE OF PROGRAM

FRESHMAN YEAR		SOPHOMORE YEAR			
	Fall <i>Units</i>	Spring <i>Units</i>		Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	Military Science	2	2
Botany 1A-1B	4	4	Chemistry 8, 5	3	3
Chemistry 1A-1B	5	5	Zoölogy 10	3	..
Agronomy 1, Horticulture 2, or Truck Crops 1	3	3	Bacteriology 1 .....	..	4
English 1A	3	..	Economics 1A	3	..
Elective	3	3	† Botany 7 .....	..	4
			Physics 2A-2B	3	3
			Elective	3	2
	—	—		—	—
	17	17		17	18

The following divisions of the College of Agriculture offer majors under the plant science curriculum:

Agronomy. The instruction in agronomy is designed to familiarize the student with the relation of environment to crop distribution and of soil fertility and soil management to the production of field crops; the morphology, adaptation, and principal diseases of field crops; the factors determining their quality and value, as well as the market grades, and the processes of manufacture of crop products; and the principles underlying the methods of improving these crops.

For students majoring in agronomy, 12 units of upper division work in agronomy are required. To satisfy this requirement Agronomy 110, 111, 112, 114, and 115 are recommended.

Adequate facilities are available for graduate study and research. At Davis, one hundred acres are used for investigations with field crops. Greenhouses and laboratories at Berkeley and Davis are well equipped for work on taxonomic, morphological, physiological, genetic, and other fundamental field crop problems.

Food Technology. Instruction is given in the food technology laboratories at Berkeley in the bacteriological, physical, and chemical examination of various fruit and vegetable products, such as dried fruits, wines, canned fruits and vegetables, tomato products, preserves, jellies, fruit juices, and vinegar; morphology and physiology of the fermentation and food spoilage organisms; the application of principles of fermentation, and properties of plant pigments.

* For example of this curriculum at Los Angeles, see Plant Science, page 56.

† Berkeley students should substitute elective units.

The laboratory instruction is supplemented by visits to factories and to the research and control laboratories of several important food products industries in the San Francisco Bay region. Prospective students should be well trained in analytical and organic chemistry and in bacteriology.

Genetics. A general course in genetics with a prerequisite of general botany and zoölogy is offered at Berkeley. This course serves: (1) as an introduction to the field for students who intend to go further in either genetics, breeding, or eugenics; (2) as part of the biological foundation for teachers of biology and students of medicine and the social sciences; (3) as a general cultural course.

The other undergraduate courses in genetics serve: (1) as essential preparation for students intending to specialize in genetics; (2) as desirable preparation for those wishing to become scientific plant and animal breeders; (3) as further preparation for teachers of biology. In addition to the Berkeley courses in genetics, more specialized courses in plant and animal breeding are given at Davis.

Students who intend to specialize in the field of genetics or breeding are advised to study general biology, chemistry, advanced mathematics including statistics, advanced zoölogy and botany, especially cytology, and modern foreign languages. Such students should consult the Division of Genetics as early as possible in their college careers.

Irrigation. This division is concerned with the agricultural and economic phases of irrigation and the engineering phase so far as it relates to construction and use of irrigation systems. Undergraduate instruction at Davis, consisting of classroom work and field practice, covers the various steps in the development of irrigation systems, the use of irrigation water on the farm, and the principles underlying irrigation in its soil and plant relationships. It includes such subjects as measurement of irrigation water, preparation of land for irrigation, design and construction of water delivery systems, development of farm irrigation pumping plants, water requirements of crops, methods of applying water, soil moisture studies under irrigation, hydrologic studies pertaining to the conservation and development of irrigation water supplies, and related problems.

Advanced instruction deals mainly with basic problems of soil moisture and the moisture relations of plants in their various irrigation aspects, for which both field and laboratory facilities are available. The division also is prepared to direct a limited number of advanced students in other agricultural phases of irrigation and in problems of irrigation economics and community irrigation organization.

As the major part of the University Farm of 1,625 acres is under irrigation, there is ample opportunity for field studies. The division has at its disposal about fifty acres which are used for instruction and investigation purposes. It also conducts field investigations in various parts of the State, some of which are in coöperation with the Federal and State agencies.

Plant pathology. Opportunities for professional work in this field are available in Federal and State plant disease work, college and university teaching, research institutions, extension and regulatory agencies, and, to some extent, in commercial organizations. Knowledge of plant diseases is valuable also in many kinds of agricultural practice. For professional work in plant pathology graduate study is necessary, and the attainment of the degree of Doctor of Philosophy is desirable.

Preparation for advanced work in plant pathology should include the following subjects: botany (taxonomy, anatomy, cytology, physiology, and mycology), bacteriology, genetics, chemistry (quantitative, organic, physical; and plant biochemistry), French, German, and such other courses as may be prerequisite to these subjects.

The division is well equipped with laboratories and apparatus for investigation, not only of the usual mycological phases, but also of the physiological aspects of plant disease work.

The facilities include laboratories, greenhouses, and land. An unusual opportunity for advanced work is offered at the Citrus Experiment Station at Riverside. Undergraduate and course work must be completed at Berkeley, before graduate research may be undertaken elsewhere.

Pomology. Excellent facilities are provided for undergraduate and graduate work in the production of deciduous fruits, a major industry in California. The orchards at Davis comprise one hundred acres of trees, including fairly complete collections of all important varieties of deciduous fruits and nuts. At Davis cold storage plants are fully equipped for holding fruit at any desired temperature necessary for classroom or research purposes, and greenhouses are available for teaching and research. The laboratories at Davis have the necessary apparatus for graduate study and research in physiological and other problems fundamental to the fruit industry.

For courses in Pomology, see under Horticulture, pages 122-124.

Horticulture. Since a large part of California enjoys a subtropical climate, the production of subtropical fruits and nuts provides major horticultural industries in this State. Moreover, because of the diversity of climatic conditions, there is in California a wider range of subtropical fruit industries than exists elsewhere in the United States.

The major covering these crops is offered by the College only at Los Angeles.

With the exception of the major work, the plant science curriculum requirements are the same at Berkeley, Davis, and Los Angeles, and it is possible for the student to transfer from one to another of these campuses. Students electing the major in Subtropical Horticulture may spend, therefore, the first two years at Berkeley or Davis if they so desire. Attention also is directed to the fact that a student planning to elect a major other than horticulture, or a curriculum other than that of plant science, may matriculate at Los Angeles and later, usually at the end of the sophomore year, transfer to the campus

ANIMAL SCIENCE

For degree requirements, see page 48.

EXAMPLE OF PROGRAM†

FRESHMAN YEAR			SOPHOMORE YEAR		
	Fall	Spring		Fall	Spring
	Units	Units		Units	Units
Military Science	2	2	Military Science	2	2
Zoology 1A-1B	5	5	Animal Biochemistry	3	2
Chemistry 1A-1B	5	5	Bacteriology 1 . . . . .	..	4
Geology 1A . . . . .	..	3	Economics 1A-1B	3	3
†Animal Husbandry 7	3	..	Physics 2A-2B	3	3
†Animal Husbandry 8	2	..	Botany 1A	4	..
*Electives . . . . .	..	3	*Electives . . . . .	..	3
	<hr/>	<hr/>		<hr/>	<hr/>
	17	18		15	17

The additional required courses such as animal nutrition (Animal Husbandry 101 and 103, or Poultry Husbandry 104 and 106), animal physiology (Animal Husbandry 110), and parasitology (Veterinary Science 111 or Entomology 116), ordinarily are taken during the junior and senior years. The student should consult his major subject adviser concerning the 12 units required in the major subject and also elective courses. He may elect any agricultural course described on pages 83-132 of this prospectus. The student at Berkeley should consult the GENERAL CATALOGUE for courses open to him in other departments of the University.

The following divisions of the College offer major work under the animal science curriculum:

Animal husbandry. Instruction in animal husbandry deals with the underlying sciences and their application to livestock husbandry, with special reference to conditions in California. The division has developed herds and flocks of several breeds of each livestock species which is economically important. These are used for student instruction in breeding, feeding, management, and judging.

Nutrition, physiology, genetics, and wool laboratories, and a small animal colony are provided in the Animal Science Building. The Davis divisions of zoölogy and of entomology and parasitology, and veterinary science, have their laboratories in the same building and cooperate closely in research and teaching with the animal husbandry division.

There are three psychrometric rooms which provide for controlled humidity and temperature regulations from 15 per cent relative humidity to saturation, and from 40° to 120° F. One room is constructed to hold two domestic animals

* See the mathematics requirement under (4), page 47.

† Students registered at Berkeley or Los Angeles should substitute courses from the sophomore year.

‡ Dairy Industry and Poultry Husbandry majors should consult their major advisers for variations in this schedule.

as large as cows. In addition to moisture and humidity, the climatic cabinet is equipped for changes in barometric pressure from below sea level to an altitude of 10,000 feet, and for ultraviolet illumination. The third room has facilities for the study of wool under controlled moisture and temperature conditions.

A respiration chamber is available in which two cows may be kept, together or in separate compartments, for energy and metabolism studies; and there is a metabolism room for conducting digestion trials and balance experiments on domestic animals.

Dairy industry. Instruction is offered in the principles and art of manufacturing dairy products for the student who wishes to enter dairy manufacturing or dairy farming; to prepare for positions as operator, manager or inspector of dairy farms, creameries, cheese factories or city milk and ice cream plants; or to become a farm advisor, a teacher in high school or agricultural college, a technician, or a research worker in an agricultural college.

The facilities of the Division of Dairy Industry at Davis consist of a modern dairy plant with the latest types of equipment for dairy products manufacturing, and chemical, bacteriological and testing laboratories. The dairy manufacturing is in daily operation where market milk is pasteurized, butter, cheese, ice cream, condensed milk and dried milk are processed regularly. This provides excellent opportunities for student instruction. Courses in dairy cattle production are given by the Division of Animal Husbandry, which maintains a well-equipped dairy barn and a herd representing the principal breeds of dairy animals.

Poultry husbandry. The value of good breeding stock, better rations and a sound program of flock management in contributing to a more efficient and profitable enterprise has been increasingly recognized by poultrymen in recent years. Industries handling products for sale to poultrymen as well as those marketing poultry products have also emphasized the need of improved methods of production. As a result there has been a good demand for men with adequate training and experience in poultry work. Students with exceptional ability and sound fundamental training have had opportunities for graduate study or employment in experiment station and extension service work.

The introductory course presents a general survey of the present knowledge of poultry husbandry in relation to several fundamental sciences which contribute methods used in poultry production. Advanced courses in the application of genetics, nutrition, and embryology to poultry provide a detailed review of knowledge regarding successful methods of breeding, feeding and hatching of poultry as well as the experimental basis for solution of problems in these fields. Special study for advanced undergraduates or graduates gives opportunity for students to work problems in special fields and to become acquainted with experimental methods.

Veterinary science. The courses in veterinary science are intended to supplement instruction in the animal industries group. They do not prepare for the practice of veterinary medicine.

At Berkeley, advanced undergraduates majoring in animal industries may take courses in special topics. The division is equipped with the necessary apparatus for work in comparative pathology and bacteriology. Students majoring in animal industries at Davis may study the diseases of animals, and graduates may take special research problem courses.

A School of Veterinary Medicine has been authorized by the Regents and appropriations for facilities have been made by the Legislature. Although plans are being drawn for the necessary physical facilities, exigencies of construction are such that no definite date can be set at this time for the acceptance of professional students.

Genetics. See page 54.

ENTOMOLOGY AND PARASITOLOGY

This curriculum is designed for the basic biological training of investigators in entomology and parasitology, as well as for those who intend to engage in teaching or the commercial practice of entomology.

EXAMPLE OF PROGRAM

FRESHMAN YEAR			SOPHOMORE YEAR		
	Fall <i>Units</i>	Spring <i>Units</i>		Fall <i>Units</i>	Spring <i>Units</i>
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B.....	5	5	Zoölogy 1A-1B	4	4
Botany 1A-1B	4	4	Entomology 1	4	..
English 1A-1B or Public Speaking 1A-1B	3	3	Chemistry 8.....	..	3
Elective	3	3	Bacteriology 1 .....	..	3
			Bacteriology 4 .....	..	2
			Physics 2A	3	..
			Agronomy 1	3	..
			Elective	2	3
	—	—		—	—
	17	17		18	17

The four-year course is not sufficient preparation for investigation or teaching. The student who wishes to enter one of these fields must spend from one to three years in graduate study. There are, however, certain kinds of inspectional and practical insect control work the student may undertake after completing the four-year course. Among these are careers as county agricultural inspectors, county agricultural commissioners; county, state, and federal quarantine officers; entomologists in city, county, state, and federal agricultural and public health services; and for entomological specialists in the state and federal agricultural extension services.

The instruction in entomology is concerned with taxonomy, ecology (in-

cluding insect behavior), physiology, insect anatomy, agricultural entomology (inclusive of biological control), medical and veterinary entomology, forest entomology, toxicology, insect-borne plant diseases, and beekeeping. Provision is made for the training of specialists and the supplementary training of zoölogy teachers. Broad zoölogical and botanical preparation is necessary as well as advanced training in chemistry and plant pathology.

In parasitology, the courses prepare students to become teachers, investigators, or experts in parasitology in the various fields of public health and animal industry. The work also is intended to supplement instruction in veterinary science, animal husbandry, and public health. Broad preparation in zoölogy, particularly protozoölogy, and bacteriology is advised.

Students planning to major in this field should enroll at Berkeley or transfer there at the earliest opportunity.

For degree requirements, see page 48.

For example of program in Entomology and Parasitology, see page 59.

The student should consult his major adviser concerning his program.

AGRICULTURAL ECONOMICS

Instruction in agricultural economics is intended to assist the student in preparing for adequate leadership in rural affairs. The curriculum offers the student an opportunity to obtain a broad university training, and to acquire a knowledge of the effect of economic forces upon the general welfare of the farming population and especially upon the raising, processing, and marketing of agricultural products.

EXAMPLE OF PROGRAM

FRESHMAN YEAR			SOPHOMORE YEAR		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A, 8	5	3	Business Administration		
Economics 1A-1B	3	3	6A-6B	3	3
English 1A-1B or Public			Mathematics 11A-11B	3	3
Speaking 1A-1B	3	3	History 17A-17B	3	3
Botany 12	4	..	Economics 40 .....	..	3
Horticulture 2 .....	..	3	Geology 1A	3	..
Elective .....	..	3	Truck Crops 1 .....	..	3
			Zoölogy 10	3	..
	—	—		—	—
	17	17		17	17

Many of the graduates in agricultural economics engage in farming as either proprietors or managers; others become associated with agricultural market-organizations, with handlers of agricultural products, materials, and equipment, or with farm-credit agencies; and yet others obtain employment in agricultural extension work or high school teaching. A few undertake graduate work.

Students who expect to become professional agricultural economists should complete one or more years of graduate work. As preparation for graduate study the student should include in his undergraduate curriculum more courses in economic theory, mathematics, and statistics than those listed in the minimum requirements on page 49. More detailed information is given in the ANNOUNCEMENT OF THE GRADUATE DIVISION IN AGRICULTURAL ECONOMICS, which may be obtained from the Dean of the Graduate Division, University of California, Berkeley 4, California.

FORESTRY

This department offers undergraduate and graduate training in the several branches of forestry. The curriculum is designed to give the student a broad university training and a thorough understanding of forestry in its biological, industrial, economic, and social aspects. Courses are so arranged that the undergraduate student, in his last two years, may specialize to some extent in pure forestry, range management, or an allied field such as lumber industry, logging, or lumber merchandising, or he may prepare for the graduate work which will qualify him for a technical position in a federal, state or county forestry organization. The student who intends to do graduate research in forestry may include in his undergraduate program many basic scientific courses which are prerequisite to such work.

For students interested in wildlife management, there is a four-year curriculum in the College of Letters and Science. For detailed information, apply to the Chairman of the Department of Zoölogy, University of California, Berkeley 4.

Forestry students who have taken more than the minimum amount of work in soil science, together with such electives as Forestry 125 (Forest Influences) and Forestry 106-107 (Forest Planting) find themselves well prepared for work with the Soil Conservation Service, in the phases of its work dealing with forestation.

The student who is interested primarily in the engineering phases of the lumber business or the chemistry of forest products is advised to enter the College of Engineering or Chemistry, and to take as many forestry courses as possible, particularly those in wood technology, engineering, and lumber manufacturing. If the business side of the lumber industry is the student's main concern, he should major in the agricultural economics curriculum of the College of Agriculture, or enter the School of Business Administration and elect suitable forestry courses.

Major courses in forestry are offered only on the Berkeley campus.

For degree requirements, see page 49.

In the summer following his junior year, the student is required to take Forestry 105A-105B, which is given at the summer camp at Meadow Valley, Plumas County, California. The work continues for twelve weeks.

The student who completes the lower division program outlined below has before him, at the beginning of his junior year, all of his forestry requirements, part of his prescribed work in entomology, economics, zoölogy, botany, soil science, and a number of elective units. The problems of choice and arrangement of this work are too complex to permit the outlining of a typical program for the upper division years. With the help of his faculty adviser, each student must prepare his own program.

EXAMPLE OF PROGRAM

	FRESHMAN YEAR		SOPHOMORE YEAR	
	Fall Units	Spring Units	Fall Units	Spring Units
Chemistry 1A, 8.....	5	3	Physics 2A-2B, 3A-3B.....	4 4
Zoölogy 10.....	3	..	*Engineering 1A-1B.....	3 3
†Botany 12.....	..	4	Economics 1A-1B.....	3 3
Public Speaking 1A-1B or English 1A-1B.....	3 3	3 3	Geology 1A.....	3 ..
Mathematics 8A-8B.....	3	3	Statistics.....	.. 3
Military and Physical Edu- cation.....	2½	2½	Military and Physical Edu- cation.....	2½ 2½
	<hr/> 16½	<hr/> 15½		<hr/> 15½ 15½

Range management. The student who specializes in range management must include in his 30 units of forestry courses at Berkeley, Forestry 101 and 102 in his junior year and Forestry 123 in his senior year. He must also fulfill the prerequisites to Forestry 123, which are Forestry 101, 102, 103, Engineering 1A-1B, and Botany 108 and 120A.

Detailed information concerning the junior and senior requirements in forestry and range management is given in the ANNOUNCEMENT OF THE DEPARTMENT OF FORESTRY, which may be obtained from the Department of Forestry, 231 Giannini Hall, University of California, Berkeley 4, California.

SOIL SCIENCE

Soil science as a profession has experienced wide recognition and expansion during the last decades. From a field consisting of largely unorganized and often questionable facts, the study of soils has developed into a highly technical science with broad economic and social ramifications. Graduates with majors in soil science occupy positions as research workers in numerous government, state, and private research laboratories; they are managers of farms and commercial greenhouses; they act as soil fertility and plant nutrition specialists in large agricultural corporations including the fertilizer industry; they are government and state soil surveyors and conservationists. As teachers in

* Trigonometry and geometrical drawing are prerequisite to Engineering 1A-1B, and should be taken in the high school.

† Students who prepare for forestry at other institutions which do not offer a one-semester course in General Botany (equivalent to Botany 12) should take the year course (Botany 1A-1B or equivalent) usually carrying 8 units of credit. This does not take the place of 6 units of Plant Physiology with laboratory (Botany 120A-120B and 121A).

agricultural colleges and universities, as farm advisors and as land use planners they are influential in advancing education in agriculture and in contributing to the betterment of the economic welfare of the farm population.

The training of soil scientists follows a plan that emphasizes development of scientific thinking and training in essential, intellectual work habits. It enables the student to gain facility and competence in applying scientific principles to problems of crop production, soil management, and soil classification. This plan includes among its objectives: (1) a working knowledge of elementary mathematics and an acquaintance with calculus; (2) a thorough background in chemistry and a well-grounded knowledge of physics; (3) a familiarity with botany, especially plant physiology, plant nutrition, and microbiology; (4) a good foundation in the geological sciences with emphasis on petrology. In each of these fields at least a C grade must be attained.

Instruction in soil science is intended to familiarize the student with modern views on soils, and soil plant relationships. Basic courses on soil characteristics, soil chemistry, and soil microbiology cover texture, structure, and consistence of soils, soil moisture in all its phases, chemical composition of soils and chemical reactions, microbiological activities in soils, and, in general, factors determining soil productivity. Basic courses in soil morphology deal with the factors and processes of soil formation, profile description, methods of soil mapping and classification, and agricultural utilization of soils. More advanced courses emphasize soil physics in all its aspects; they discuss selected chemical phenomena including adsorption and base exchange processes, and they embrace an intensive study of the properties of colloidal systems. Advanced instruction in plant nutrition considers the relationships between metabolic processes of plants and their mineral nutrition, and a survey of deficiency diseases.

Students who intend to become soil scientists should realize that agricultural experience is desirable for a practical application of the scientific principles of soil management and plant nutrition. Majors who wish to pursue special phases of applied soil science may profitably spend the fall semester of the junior or senior year, or possibly an additional year, at the College of Agriculture at Davis.

The four-year program does not provide sufficient time for the study of soil in relation to the broader aspects of economic and social planning. Students qualified for advanced work may pursue such studies by taking appropriate courses in economics, geography, history, philosophy, etc.

Students who expect to become investigators or teachers should plan to undertake graduate work leading to the degree of Doctor of Philosophy. Advanced work in the basic sciences, including additional mathematics, is essential for this purpose.

Several of the courses in soil science are also given at Davis and at Los Angeles. This admits of the possibility of combining the education at the various campuses of the University.

For degree requirements, see page 50. For requirements for higher degrees, students are referred to the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the ANNOUNCEMENT IN AGRICULTURE AND RELATED SCIENTIFIC FIELDS, which may be obtained from the Dean of the Graduate Division, Berkeley 4, California.

EXAMPLE OF PROGRAM

FRESHMAN YEAR			SOPHOMORE YEAR		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Botany 1A-1B	4	4	Chemistry 5, 8	3	3
Chemistry 1A-1B	5	5	Economics 1A-1B	3	3
Physics 2A-2B	3	3	Geology 1A	3	..
Physics 3A-3B	1	1	Mineralogy 2	3	..
Elective	2	2	Bacteriology 1 . . . . .	..	3
			Bacteriology 4 . . . . .	..	2
			Elective	3	4
	—	—		—	—
	17	17		17	17

LANDSCAPE DESIGN

Landscape design is the art of land planning for human use and enjoyment, and as one of the recognized planning professions, it calls for a high degree of technical training for its successful practice.

The curriculum is intended to prepare students for the professional practice of landscape architecture in all its varied phases, and students should expect to devote at least five years to technical preparation, followed by a period of practical experience in the field, and European study and travel if possible.

For degree requirements, see page 50. Students planning to take this curriculum should register at Berkeley.

EXAMPLE OF PROGRAM

FRESHMAN YEAR			SOPHOMORE YEAR		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Botany 12 . . . . .	..	4	Architecture 12	1	..
Art 2A-2B	2	2	Architecture 50	2	..
English 1A-1B or Public Speaking 1A-1B	3	3	Engineering 21 . . . . .	..	3
Architecture 1, 2	3	2	Art 3A-3B	3	3
Economics 1A-1B	3	3	Landscape Design 1A-1B	3	3
Elective	3	..	Landscape Design 2 . . . . .	..	2
			History 4A or Philosophy 6A	3	..
			Elective	2	3
	—	—		—	—
	16	16		16	16

The student should consult his major subject adviser concerning the 30 units of work required in landscape design and also his choice of elective units.

According to his needs, the student may elect courses in architecture, engineering, English, economics, graphic art, and the sciences.

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

AGRICULTURAL EDUCATION

This curriculum is designed specifically for students who intend to qualify for positions as vocational agricultural teachers in the high schools of California. The program offers those desiring to enter the teaching field a broad introduction to the various fields of endeavor comprising agriculture. The course also serves as an excellent preparation for the student who desires a general course in agriculture as a preparation for diversified farming, or a broad agricultural training as a foundation for a business career involving agricultural contacts.

EXAMPLE OF PROGRAM

FRESHMAN YEAR			SOPHOMORE YEAR		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Zoology 1A	5	..
Botany 1A-1B	4	4	Truck Crops 1 .....	..	3
Horticulture 2	3	..	Physics 2A-2B	3	3
†Animal Husbandry 7	3	..	Economics 1A-1B	3	3
Agricultural Engineering 12 ..	2	2	†Animal Husbandry 8	2	..
Poultry Husbandry 1	3	3	Bacteriology 1 .....	..	4
			Chemistry 8	3	..
			Elective .....	..	3
	—	—		—	—
	17	16		18	18

The satisfactory completion of this curriculum meets the undergraduate requirements for the general secondary credential with a major in agriculture. Undergraduate requirements for the special secondary credential required for teaching high school vocational agriculture under the Smith-Hughes Act may also be satisfied by a careful choice of electives. A year of graduate training is necessary to complete the requirements for either credential. Both may be obtained in a single graduate year if proper choice of undergraduate courses is made.

Transfer from either the plant or animal science curriculum to this one can be made at any time before the junior year without great loss of time, but students are cautioned to seek the advice of their major adviser at the earliest possible time.

† Berkeley students should substitute elective units.

Certain parts of the required curriculum may be completed at Berkeley, or Los Angeles, but only on the Davis campus are all the requirements offered. For degree requirements, see page 50.

HOME ECONOMICS

The Department of Home Economics was organized to serve the interests of family and institutional households. Its curriculum is designed to serve a two-fold purpose: to afford a liberal and balanced preparation for secondary school teachers of home economics and extension workers as well as for homemaking; and to provide specialized training for the professional fields which have developed out of general home economics. The first purpose is served by the major in general home economics; the second, by five other majors as follows: nutrition and dietetics, food chemistry and technology, household economics, clothing and textiles, and child development.

EXAMPLE OF PROGRAM

FRESHMAN YEAR	Fall	Spring	SOPHOMORE YEAR	Fall	Spring
	Units	Units		Units	Units
Chemistry 1A, 8.....	5	3	Physiology 1A	3	..
History, English or Public Speaking	3	3	Home Economics 1A-1B... ..	3	3
Public Health 5A	3	..	Economics 40 or Psychology 5 .....	..	3
Decorative Art 16A-16B... ..	2	2	Economics 1A-1B	3	3
*Bacteriology 1, 4.....	..	5	Home Economics 5, 7.....	3	3
Elective	3	3	Psychology 1A	3	..
			Elective .....	..	4
	—	—		—	—
	16	16		15	16

The work of the first two years is substantially the same for all students. The program of the third and fourth years is determined by the major chosen.

For the teaching credentials—special secondary, general secondary or junior college—the general home economics major is advised. A fifth year in graduate residence is also required in order to provide the necessary supervised teaching and other education courses. For details, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, BERKELEY.

A year of graduate training is required also for the student who plans to earn the Certificate in Hospital Dietetics. This is open only to those with the major in Nutrition and Dietetics. Six months of the graduate year are spent in supervised practice in the dietetic department of the University of California Hospital in San Francisco, or at another approved hospital, and one semester of graduate study on the Berkeley campus.

The Food Chemistry and Technology major is recommended for those who wish to undertake laboratory testing and research in food manufacturing and distributing establishments, or public health food inspection.

* Davis students should enroll in Bacteriology 1 only.

The Household Economics major is suitable for preparation for social service, consumer service in business or government, and for household equipment and management specialists.

The Clothing and Textiles major is designed for the training of specialists in textile economics and research, and costume design.

The Child Development major is intended for the student of child psychology and family relations and for prospective nursery school and kindergarten teachers.

For degree requirements, see page 51. For requirements of the higher degree see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

AGRICULTURAL ENGINEERING

The curriculum in agricultural engineering is given in the Colleges of Engineering, Berkeley and Los Angeles, 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 campus (or the first two years in a junior college with the third year at Berkeley or Los Angeles). The last year and the summer field course must be taken at Davis. The curriculum is designed to prepare the student to apply engineering principles to 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. Supplementary courses in irrigation and soil science treat, respectively, hydraulic systems, ground-water supplies, plant use of water; and soil profiles, properties, structure, classification, and management. A special summer practice and travel course is offered which includes a study of engineering problems on typical farms in California, and laboratory and field practice in the operation of farming equipment.

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

The student should have the following high school preparation for engineering: plane geometry, 1 unit; algebra, 2 units; trigonometry, $\frac{1}{2}$ unit; mechanical drawing, 1 unit; physics or chemistry, 1 unit (both desirable). Also recommended are solid geometry; free-hand drawing; shop work; and foreign language.

The student must enroll in the College of Engineering at Berkeley or Los Angeles, of which this curriculum is a part, and transfer to the Davis campus at the end of his junior year.

University of California

EXAMPLE OF PROGRAM
(College of Engineering)

FRESHMAN YEAR					
BERKELEY	Fall Units	Spring Units	LOS ANGELES	Fall Units	Spring Units
Military Science	2	2	Military Science and Physical Education	4	4
Mathematics 3A-3B	3	3	Mathematics 1 (or 3A), 3B.	3	3
Physics 4A	4	4	Physics 1A-1B	3	3
Chemistry 1A, 8	5	3	Chemistry 1A-1B	5	5
Engineering 22, 23	2	2	Engineering 2	3	..
Engineering 1A .....	..	3	Engineering 1LA .....	..	2
Elective	3	..	Engineering 1FA .....	..	1
	<hr/>	<hr/>		<hr/>	<hr/>
Engineering 48 (recom- mended)	1	..		18	18

SOPHOMORE YEAR					
BERKELEY	Fall Units	Spring Units	LOS ANGELES	Fall Units	Spring Units
Military Science	2	2	Military or Naval Science and Physical Education .	4	4
Mathematics 4A-4B	3	3	Mathematics 4A-4B	3	3
Physics 4B-4C	4	4	Physics 1D-1E	3	3
Engineering 40A-41	2	4	Economics 1A-1B	3	3
Engineering 35 .....	..	3	Geology 2	3	..
Engineering 24	2	..	Engineering 6 .....	..	3
*Agricultural Engineering 12 ..	..	2	*Engineering 12 .....	..	2
Elective	3	..		<hr/>	<hr/>
	<hr/>	<hr/>		16	18

JUNIOR YEAR					
BERKELEY	Fall Units	Spring Units	LOS ANGELES	Fall Units	Spring Units
Mechanical Engineering 102B	3	..	Engineering 102A-102B ...	3	3
Mechanical Engineering 103	3	..	Engineering 103 .....	..	3
Mechanical Engineering 105A-105B	3	3	Engineering 105A-105B ...	3	3
Civil Engineering 108A ...	3	..	Engineering 108A-108B ...	3	2
Civil Engineering 108F ...	1	..	Engineering 108F .....	..	1
Electrical Engineering 100A-100B	3	3	Engineering 100A-100B ...	3	3
Electrical Engineering 104A-104B	1	1	Engineering 104A-104B ...	2	2
Irrigation 103 .....	..	2	Engineering 109	3	..
Mechanical Engineering 106 (or Civil Engineering 107A) .....	..	4		<hr/>	<hr/>
Elective .....	..	3		17	17
	<hr/>	<hr/>			

Agricultural Engineering 49 (6) required summer field course at Davis.

* Not required of students entering with upper division standing.

EXAMPLE OF PROGRAM (Continued)

SENIOR YEAR		Fall	Spring
DAVIS		Units	Units
§ Agricultural Engineering 113	.....		4
§ Agricultural Engineering 114	.....	3	..
§ Agricultural Engineering 115	.....	3	..
§ Agricultural Engineering 130	.....		1
Mechanical Engineering 151 (or soils 110)	..	3	..
Mechanical Engineering 152	.....		3
*§ Irrigation 120	.....	3	..
*§ Soil Science 106	.....		3
Agronomy 1	.....	3	..
Elective	.....		3
		—	—
		15	14
Agricultural Engineering 6 (recommended)	..		2

REQUIREMENTS FOR TEACHING CREDENTIALS

The student who desires to teach agriculture or home economics in the secondary schools may obtain the special secondary credential in vocational agriculture or home economics, or the general secondary teaching credential, or both from the State Department of Education. At least one year of graduate work is required to fulfill the requirements.

The special credential permits the holder to teach vocational agriculture under the Smith-Hughes Act or family life education under the Federal and State Vocational Education Acts, but without a general secondary credential the future teacher will be severely handicapped.

The holder of the general credential with a major in agriculture or home economics may teach, in addition to agriculture or home economics, any high school subjects in which he is prepared. The General Secondary Credential alone does not entitle the holder to teach agriculture in high school departments organized under the Federal and State Vocational Educational Acts (Smith-Hughes and George-Deen). The Vocational Agricultural Education Credential is necessary.

Inquiries concerning requirements should be addressed to the Dean of the School of Education, University of California, Berkeley 4, or the Dean of the School of Education, University of California, 405 Hilgard Avenue, Los Angeles 24, California.

§ These courses include engineering economics, but Agricultural Economics 118 is recommended in addition.

* If Irrigation 120 is not given in the first semester, students should take Soil Science 110, which is an acceptable substitute for Soil Science 106.

GRADUATE STUDY

The conditions for graduate study in all branches of agriculture are exceptionally favorable in California. The diversity of climate, forests, natural livestock ranges, crops, and soils provides a wide choice of subjects for investigation.

Work leading to higher degrees may be pursued at Berkeley, Riverside, Davis, Los Angeles, and at other places approved by the appropriate Graduate Council.

At Berkeley there are adequate greenhouses and the laboratory and library facilities which a great university provides.

The College at Davis has lands, orchards, vineyards, greenhouses, and laboratories for field and laboratory research. It maintains herds and flocks of all livestock species of commercial importance.

At the Citrus Experiment Station at Riverside there are extensive facilities for study and research by properly prepared students. Graduate work in horticultural science may be pursued on the Los Angeles campus.

Further information is given in the ANNOUNCEMENT OF THE GRADUATE DIVISION IN AGRICULTURE AND RELATED SCIENTIFIC FIELDS, which may be obtained from the Dean of the Graduate Division, Northern Section, University of California, Berkeley 4, and the ANNOUNCEMENT OF THE GRADUATE DIVISION, SOUTHERN SECTION, which may be obtained from University of California, 405 Hilgard Avenue, Los Angeles 24, California.

MISCELLANEOUS INFORMATION

EXPENSES—LIVING ACCOMMODATIONS EMPLOYMENT—SCHOLARSHIPS—LOANS

THE TOTAL AVERAGE yearly expense in the College of Agriculture is estimated at approximately \$500 for the student who is a resident of California, and \$650 for the nonresident student. The entering student must be prepared to meet expenses amounting to \$135 in the first month.

FEES

Tuition fee. Tuition is free to residents of California. The student classed as a nonresident pays a tuition fee of \$150 a semester, in addition to the incidental fee. (See the GENERAL CATALOGUE, Berkeley or Los Angeles, for regulations concerning the tuition fee).

Incidental fee. The incidental fee for the student at Berkeley is \$27.50, and at Davis it is \$25. The incidental fee for undergraduate students at Los Angeles is \$29. This fee, which must be paid on the date of registration, covers certain expenses of students for library books, for athletic and gymnasium facilities and equipment, for lockers and washrooms, for registration and graduation, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service on each campus. No part of this fee is remitted to those students who may not desire to make use of all or any of these privileges.

The incidental fee at Los Angeles and Davis includes the student-body membership fee. At Berkeley, the student pays an additional \$5 a semester to join the student body association. Membership privileges include participation in student affairs, a free subscription to the student newspaper, free admission to many athletic contests and reduced admission rates to others, and membership in the Henry Morse Stephens Memorial Student Union, which is the center of campus life.

Laboratory fees. In the laboratories, fees are apportioned on the basis of materials actually used. In the elementary laboratories the fee amounts to from \$1.50 to \$34.50 a semester.

LIVING ACCOMMODATIONS AND EXPENSES

Berkeley. The cost of board and lodging depends entirely on the type of accommodation desired. In the boarding houses the estimated cost is between \$45 and \$55 for men, and \$37.50 and \$60 a month for women. In the majority of the boarding houses for women the cost includes lodging and two meals per day. In the men's coöperative houses the cost is approximately \$32.50 a month, and in the women's coöperative houses between \$30 and \$35 a month. Monthly bills

in sorority and fraternity houses, and in clubhouses range from \$52.50 to \$65 exclusive of initiation and pledge fees. These prices ordinarily include dues, lodging and three meals per day. Apartments vary greatly in price, depending on size and location, but during the war period they have been difficult, if not impossible, to obtain. This situation still prevails.

Lists of approved boarding and lodging houses for women, information about men's accommodations, fraternities, sororities, and clubs, and advice and information about other types of accommodations may be obtained from the Dean of Students and the Dean of Women, 201 Administration Building, University of California, Berkeley 4, California. The University is within commuting distance of Oakland and other Eastbay cities, and San Francisco.

Whatever type of lodgings the student engages he is urged at the time of making his reservation to have a clear understanding in writing with the proprietor regarding terms of payment, charges, if any, for the vacation periods, laundry privileges, the use of baths, etc.

All *undergraduate women* students under 21 years of age are required at the time of registration to have their college residences approved by the Dean of Women. This approval is given to women students living with their parents, to those living in houses approved by the University, and to those living in sororities and student clubs. No other arrangement for lodgings should be completed without consultation with the Dean of Women.

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 such houses is published annually. Proprietors of these approved houses expect students to remain throughout an entire semester and usually require a written contract to this effect. Reservations must be made with the person whose name appears on the list as manager.

Fernwald Dormitories are seven new dormitories for women. The price for room and board, with three students in a room, is \$225 per semester. Application should be made to the office of the Dean of Women.

Stern Hall, a dormitory for women students, is a gift of Mrs. Sigmund Stern. It accommodates 90 women. The price for room and board is \$250 a semester. Application must be made to the Dean of Women at least four months in advance of prospective residence. In addition, there are seven new dormitories for women. The price for room and board with three students in a room is \$225 a semester. Application should be made to the office of the Dean of Women.

Bowles Hall, a dormitory 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 Dean of Students approximately four months in advance of prospective attendance. The charge for room and board is \$225 a semester.

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, California.

Davis. The University maintains three dormitories for men and women and a dining hall at the College of Agriculture at Davis. Board in the dining hall on the cafeteria plan costs from \$40 to \$50 a month. The price is approximately the same in the city of Davis and in the various fraternity and clubhouses. All students are invited to patronize the dining hall operated on the campus for their convenience.

Single and double rooms cost from \$12.50 to \$15 a month. Rooms contain the necessary furniture and linen. The room rent includes the weekly laundering of linen. The rooms available will be reserved in the order of receipt of a deposit of \$3, which will apply on the first month's rent. This deposit will be returned if the applicant is not admitted to a dormitory. Reservations will not be held after the first day of registration except by special arrangement with the Comptroller's office. If reservations are not used or canceled after the first day of instruction, the deposit will not be refunded. Accommodations are provided for both men and women students. To reserve a room send \$3 to the Comptroller's office, College of Agriculture, Davis, California. Money orders or bank drafts should be made payable to The Regents of the University of California.

Besides the University dormitories, six fraternities, three hotels and many private homes provide living accommodations. Information concerning off-campus living may be obtained upon request from the Office of the Dean.

All undergraduate women students under 21 years of age are required to have their college residence approved by the Adviser to Women at the time of registration. This approval is given to women students living with their parents, and to those living in the University dormitories or in houses approved by the University.

Los Angeles. The cost of board and lodging in boardinghouses near the campus ranges from \$40 to \$60 a month. The student who does his own cooking may obtain a housekeeping room for from \$18 to \$30 a month, but this plan is not recommended.

Mira Hershey Hall, a dormitory for women, provides board and room for 128 students at \$50 a month. There is no University dormitory for men.

Families or groups of mature students may obtain houses or apartments in Los Angeles or other communities relatively near the campus, such as Beverly Hills, Sawtelle, Santa Monica, and Westwood Hills.

Women students are not permitted to live in apartments unless the Dean of Women approves their arrangements for chaperonage. Lists of approved boarding houses for men and for women may be obtained from the offices of the Dean of Undergraduates and the Dean of Women.

OPPORTUNITIES FOR EMPLOYMENT

Self-supporting students are respected. A diligent student may spend from twelve to twenty-five hours a week in outside employment while undertaking a study program of from 12 to 16 units, which requires from thirty-six to forty-eight hours of work a week. The student seeking employment should bear in mind, however, that not every kind or amount of outside work is compatible with his main purpose at the University, namely, his education.

Only rarely may a student be entirely self-supporting. No student who intends to support himself should enter the University without sufficient funds to cover the expenses of the first semester.

Students seeking employment should apply to the Bureau of Occupations at Berkeley or Los Angeles.

LOANS

In addition to the general University loan funds, regulations for which are given in the GENERAL CATALOGUE, a number of specific loan funds have been established for students of agriculture. Applications for loans should be made to the Dean of Students at Berkeley and to the Assistant Dean at Davis. Students at Los Angeles should apply to the Committee on Loans.

SCHOLARSHIPS AND FELLOWSHIPS

Complete lists of undergraduate scholarships are available on application to the Registrar, University of California, Berkeley or Los Angeles. Lists of graduate scholarships and fellowships may be obtained from the Dean of the Graduate Division, University of California, Berkeley or Los Angeles.

Applications for scholarships or fellowships for the ensuing college year should be filed before February 15. The awards are announced on Commencement Day.

Although all students of the College of Agriculture are eligible to become candidates for any general University scholarship, the following undergraduate scholarships by terms of their bequests are restricted to students of this College.

The Borden Agricultural Scholarship award, \$300. The award is made annually by the Borden Company to a senior student of agriculture who has taken at least two courses in dairy subjects, and holds the highest scholastic standing among similarly eligible students.

The Borden Home Economics Scholarship Award, \$300. This award is made annually by the Borden Company to a senior student in Home Economics who has taken at least two courses in nutrition and holds the highest scholastic standing among similarly eligible students.

The Herbert Kraft Scholarships, approximately ten scholarships, averaging \$250 each. These scholarships, which are established from the income of the sum of \$50,000 given, in 1917, to the Regents of the University by the late George S. Kraft in memory of his father, are open to any graduate of a high school in Tehama County, California, if he or his parent or parents have lived in that county for at least five years.

Peter J. Shields Scholarship, approximately \$300. Established by Regent Garret W. McEnerney for a student of the College of Agriculture enrolled on the Davis campus, and preferably from Sacramento County.

Farm Home Department Home Economics Scholarship, \$300. This scholarship was established by the Farm Home Department of the California Farm Bureau Federation. It is awarded annually to a student majoring in home economics at Davis, preferably a sophomore from a rural home.

The Loughridge Scholarship, \$100. The late Professor R. H. Loughridge bequeathed a sum of \$3000 to the University for the establishment of a scholarship for a student in the College of Agriculture.

The James Monroe McDonald Scholarships, three averaging \$350 each. A series of scholarships were established in 1921, by the late Mrs. Mary J. L. McDonald. Each applicant for one of these scholarships must be a male student who uses correct English and has good character and courteous manners, and must be enrolled or have his major studies in the department in which the scholarship is given. The scholarships are primarily for undergraduates, but may be awarded for one year of postgraduate study.

Three of these scholarships are awarded annually to students in the College of Agriculture: one, to a student who is taking special work in stock raising and grazing; one, to a student specializing in horticulture; and the remaining one to a student in any major in the College of Agriculture.

The Henry W. Seale Scholarship. These are loan scholarships. The beneficiaries must agree to return to the University of California all or part of the sums they may have received from the scholarships, without interest, when their financial condition is such that a return can be made without serious inconvenience.

Leopold Edward Wrasse Scholarship, \$300. Established by the late Leopold Edward Wrasse, a farmer in Fresno County. Awarded annually to a junior or senior student enrolled on the Davis campus, preferably a graduate of the Caruthers High School.

RESEARCH ASSISTANTSHIPS IN AGRICULTURAL ECONOMICS

Through the Giannini Foundation, funds have been made available for a small number of Giannini Fellowships and Research Assistantships ranging in stipend from \$450 to \$650.

Research assistants are assigned to specific studies, under competent guidance by a member of the staff representing the subject of the student's chief interest.

Research assistants may carry in an academic year as much as three-fourths of a regular program of graduate study.

PRIZES

The Howard Walton Clark Prize in Plant Breeding and Soil Building. Awarded each year in January to a senior student in the College of Agriculture who has shown in addition to high scholastic standing the most promise of originality and research ability in either of the fields mentioned in the title.

The Charles Lathrop Pack Prizes. Several prizes are awarded annually to the students who write the best essays or newspaper articles on forestry as it affects the public. To be eligible for an award, each contestant must have pursued at least one course in forestry during the academic year. These prizes are the gifts of the late Charles Lathrop Pack of Lakewood, New Jersey.

The California Farm Bureau Federation Rural Leadership Trophy. This trophy is awarded to the senior student who shows, by his ability, energy, and coöperative spirit, the greatest promise of leadership in the development of the farm and farm home.

Alpha Zeta Award. This award is made each fall to a sophomore at Berkeley and one at Davis who has made the highest scholarship record in his first year's work. The names of the winners and their scholarship records are engraved each year upon a permanent plaque.

The Warden Prize. This prize is awarded to the student majoring in dairy industry, who has maintained in his freshman, sophomore, and junior years, the highest scholastic record.

STUDENT ACTIVITIES

Students in the College of Agriculture participate not only in the general student affairs of the University, but also in activities of their own.

The national honor fraternity for agriculture students is Alpha Zeta, founded at Ohio State University in 1897. In 1908 the California chapter was established at Berkeley; in 1937, the California Beta chapter at Los Angeles; and in 1938 the California Gamma chapter at Davis. Members are selected for personality, capacity for leadership, and scholarship.

At Berkeley an Entomology Club and a Soil Science Club have been organized. The Forestry Club holds frequent meetings, addressed by prominent foresters, lumbermen, and experts in allied fields. Occasional social gatherings and short trips are arranged. Students who participated, while in high school, in 4-H Club work have a University 4-H organization.

The national honor society for students in home economics, Omicron Nu, has a chapter, Alpha Lambda at Berkeley. In addition, the Home Economics Club,

which is open to all students, maintains an active program of meetings and projects.

At Davis nearly every form of activity is maintained. The entire student body are members of the Associated Students of the California Aggies, which governs all student affairs on the campus and supervises the Honor System.

The students at Davis publish *El Rodeo*, a yearbook; the *California Aggie*, a weekly newspaper; and the *Mustang*, a humorous monthly magazine.

Opportunity to participate in many forms of athletics is presented at Davis. The California Aggies are members of the Far Western Conference and stress both intercollegiate and intramural athletics. The major sports include football, basketball, boxing, track, and baseball; the minor sports are tennis, wrestling, golf, riding, swimming, and skiing.

The Associated Students of the California Aggies support other activities as well. These include the band, the orchestra, the men's and women's choruses, debating, dramatics, radio broadcasting, and the rifle team. The California Club, designed to emphasize the unity of student life on all campuses of the University, is active.

Many organizations sponsor the development of special interests at Davis. The Golden Hoof Club, the Blue and Gold Dairy Club, the Horticultural Round Table, the Home Economics Club, the Senior 4-H Club, and the Gilmore Collegiate Chapter of the Future Farmers of America meet regularly to hear outstanding speakers and to enjoy social contacts. The Music Association encourages the further use of talents; the Women's Association includes all women students on the campus; the International Forum promotes friendly relations between foreign-born and native students and studies world problems; and the Newman Club and the Christian Association meet for religious and social purposes.



AIR VIEW OF THE BERKELEY CAMPUS

COLLEGE OF AGRICULTURE

COURSES OF INSTRUCTION AT BERKELEY, DAVIS, LOS ANGELES, AND RIVERSIDE

EXPLANATORY NOTE

THE CREDIT VALUE of each course in semester units is indicated for each semester by a number in parentheses following the title. A semester unit is one hour of the student's time at the University, weekly, during one semester, in lecture, or recitation, together with the time necessary in preparation therefor; or a longer time in laboratory or other exercises not requiring preparation. The session in which the course is given is shown as follows: I, first semester (September to February); II, second semester (February to June); Yr, throughout the first and second semesters. When no hours are stated it is understood that these are to be arranged later. Final information concerning class hours will be found in the SCHEDULE AND DIRECTORY.

CLASSIFICATION AND NUMBERING

Courses are classified and numbered as follows:

(1) *Lower division courses* (numbered 1-49, or sometimes indicated by letters if in subjects usually given in a high school). A lower division course is one open to freshmen and to sophomores; such courses do not count as upper division work in any department.

(2) *Upper division courses* (numbered 100-199). An upper division course is one which is open 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. Registration in upper division courses in the College of Agriculture is regulated by the possession of the necessary prerequisites rather than by class standing.

Special study courses for advanced undergraduates are numbered 199. Credit in a special study course for undergraduates may not exceed 5 units a semester.

(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).

1946-1947

**COURSES OF INSTRUCTION
OFFERED AT BERKELEY**

COURSES OFFERED ON THE BERKELEY CAMPUS

AGRICULTURAL CHEMISTRY

GRADUATE COURSE

201A-201B. **Research in Agricultural Chemistry.** (1-6; 1-6) Yr.

The Staff (Mr. Mackinney in charge)

Members of the Group in Agricultural Chemistry.†

The research work will ordinarily be under the direction of a member of the instructing staff, who is in the field of agriculture in which the student's preparation has been found to be adequate.

AGRICULTURAL ECONOMICS

An average grade of at least C in all courses undertaken is prerequisite to all upper division courses in agricultural economics.

1. **The Agricultural Industry.** (3) I. M W F, 8.

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. M W F, 10.

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. M W F, 8.

Prerequisite: Economics 1A-1B.

Mr. Erdman

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. M W F, 11.

Mr. Erdman

Prerequisite: Agricultural Economics 101A or Business Administration 123.

Farmers' coöperative organizations.

102. **Land Economics.** (3) II. M W F, 10.

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. M W F, 9.

Mr. Hoos

Prerequisite: Economics 1A-1B.

A study of the application of economic principles to the problems of agriculture.

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

105. **Agricultural Economics Measurements.** (3) I. Mr. Kuznets
Lectures, Tu Th, 9; laboratory, Th, 3-5.
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. M W F, 9. 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. M W F, 8. Mr. Voorhies
Prerequisite: Economics 1A-1B.
Farmers' credit needs, methods of financing the agricultural industry, and the agencies supplying agricultural credit.
112. **Seminar in Rural Sociology.** (2) I. W, 3-5. Mr. P. S. Taylor
The forms of human association in rural environment, including their origin, development, structure, functioning, and cultural products. Rural population, social organization and institutions, social psychology, ecological patterns, social change, social pathology.
113. **Population Problems.** (3) I. Tu Th S, 11. Mrs. Thomas
Prerequisite: Economics 40.
Urban, rural, and regional variation in population phenomena; differential fertility and mortality; selective migration.
116. **Agricultural Policy.** (3) II. M W F, 11. Mr. Benedict
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. Tu Th S, 9. 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. Tu Th, 3-5. 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.
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. Tu, 3-5. Mr. Wellman
A study of public and semipublic activities pertaining to agriculture as an industry.
NOTE.—May be repeated without duplication of credit.

203. **Research in Agricultural Economics.** (1-6) I and II.
The Staff (Mr. Wellman in charge)
- *204A. **Research Methods.** (2) I. Tu, 3-5.
Considerations of types of approach which may be used in social science research.
- 204B. **Analytical Methods in Agricultural Economics.** (3) I. Tu Th, 1-3.
Mr. Kuznets
205. **Seminar in the Marketing of Agricultural Products.** (2) II. M, 3-5.
Mr. Mehren
An analysis of the economic effects of state and Federal activity in the marketing of agricultural products.
- 206A. **Economics of Agricultural Production.** (3) I. M W F, 2. Mr. Hoos
A detailed study of the basic principles of the economics of production.
- 206B. **Economics of Agricultural Production.** (3) II. M W F, 1.
Mr. Benedict
The application of economic principles to problems of production adjustment.
207. **Advanced Land Economics.** (2) II. W, 3-5. Mr. Weeks
Land policies, planning, rent, tenure, appraisal, development and utilization.
208. **Seminar in the Conservation of Natural Resources.** (2) II. Th, 3-5.
Mr. Wantrup
The economic and social aspects of the conservation of natural resources in the United States and foreign countries with particular reference to agriculture.
209. **Seminar in Agricultural Market Organization.** (3) I. M W F, 1.
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. S, 10-12.
Mr. Adams, Mr. Tinley
An analysis of economic factors, trends, and relationships which bear upon farm organization and administration; farm management techniques.

AGRICULTURAL ENGINEERING

12. **Survey and Problems in Agricultural Engineering.** (2) II. Tu Th, 2.
Mr. Walker, Mr. Bainer
History of the development and the application and use of farm machinery; the utilization of power on the farm; the economics of farm buildings; elementary problems in the mechanics of agriculture.

AGRONOMY

1. **Introduction to Agronomy.** (3) I. F, 1-4.
Principles underlying the distribution and culture of field crops, with emphasis upon seed selection, maintenance of soil fertility, and the theory and practice of dry farming. The production of typical cereal, forage, fiber, and root crops is briefly discussed.

* Not to be given, 1946-1947.

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

Mr. Madson, Mr. Briggs, Mr. Love

Prerequisite: six units of upper division agronomy.

GRADUATE COURSE

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

Mr. Madson, Mr. Briggs, Mr. Love

ANIMAL HUSBANDRY

7. **Introduction to Animal Husbandry.** (3) II.

The Staff (Mr. Hart in charge)

A survey of the sources of the world's supply of animal products. The distribution of domestic animals in the United States. The origin, characteristics, and adaptations of the more important breeds, and influence of environment upon their development.

NOTE: Given in the spring semesters of even years.

ENTOMOLOGY AND PARASITOLOGY

1. **General Entomology.** (4) I.

Mr. Freeborn

Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.

The classification, life history, structure, and physiology of insects.

49. **Summer Practice and Observation Course.** (No credit)

Six weeks. Daily, except Sunday. The Staff (Mr. Essig in charge)

Required of all students with a major in entomology or parasitology.

106. **Insect Morphology and Histology.** (4) I.

Mr. Craig

Lectures, Tu Th, 11; laboratory, Tu Th, 1-4.

Prerequisite: Entomology 1. Fee, \$2.50.

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

Mr. Craig

Lectures, M W, 1; laboratory, Sec. 1, M, 2-5; Sec. 2, W, 2-5. Fee, \$2.50.

The general principles of insect physiology with experimental studies on nutrition, digestion, excretion, circulation, respiration and the nervous and hormonal systems.

112. **Systematic Entomology.** (4) I.

Mr. Linsley

Lecture, Tu, 9; laboratory, Tu, 10-12, Th, 9-12. Weekly field trip, S, 8-12.

Prerequisite: Entomology 1.

The classification of insects, taxonomic categories and procedure; bibliographical methods; nomenclature; museum practices.

114. **Forest Entomology.** (3) I.

Mr. Linsley

Lectures, M W, 9; laboratory, F, 1-4.

Insects affecting forest, shade, and ornamental trees.

117. **Helminthology.** (4) I.

Mr. Stewart

Lectures, F, 1, S, 8; laboratory, F, 2-5, S, 9-12.

Helminthic infections of man and domestic animals. The biology, prophylaxis, and treatment of the various parasites are dealt with in detail. The laboratory exercises are devoted to the taxonomy and identification of the parasites and to diagnostic laboratory methods.

124. **Economic Entomology.** (4) II. Mr. Essig
Lectures, M W, 1; laboratory, M W, 2-5.
Life histories, habits, distribution, economics, and control of insects attacking agricultural crops and stored products.
125. **Insect Vectors of Plant Diseases.** (4) I. Mr. Freitag
Lectures, Tu Th, 4; laboratory, Tu Th, 1-4. Fee, \$2.50.
The role of insects in the transmission and causation of plant virus diseases. Greenhouse insect-rearing and virus transmission experiments.
126. **Medical Entomology.** (4) II. Mr. Stewart
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.
The role of insects and other arthropods in transmission and causation of diseases of humans and domesticated animals.
127. **Insect Ecology.** (3) II. M W F, 11. Mr. Craig, Mr. Usinger
Principles of ecology; animal communities; insect behavior.
128. **Insect Toxicology.** (4) I. Mr. Hoskins
Lectures, M W, 1; laboratory, M W, 2-5. Fee, \$2.50.
Chemical composition and reactions of insecticides and fungicides, and their physiological effects on plant and animal tissues.
130. **Agricultural Entomology.** (2) II. Mr. Borden
Lecture, M, 10; laboratory, S, 9-12.
An advanced course in the principles and practices of experimental field entomology.
131. **Insect Pathology.** (4) II. Mr. Steinhaus
Lectures, M W F, 9; laboratory, F, 2-5.
General insect pathology and microbiology including the biological relationships between all types of microorganisms and insects. Detailed study of bacterial, fungus, virus, and protozoan diseases of insects; non-infectious diseases of insects; histopathology.
132. **History of Entomology.** (3) II. Mr. Essig, Mr. Linsley
Lectures, Tu Th, 10; Th, 11.
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, Tu Th, 8; laboratory, Tu Th, 9-12.
Habits and ecology of aquatic and semi-aquatic insects with emphasis on their relations to problems of wild life management. It is expected that this will satisfy the entomological requirements for students of the Wild Life Curriculum.
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, and Insect-Borne Plant Diseases.** (1-1) Yr.
Mr. Essig, Mr. Freitag, Mr. Linsley, Mr. Middlekauff,
Mr. Severin, Mr. Usinger

- 201A-201B. **Research in Entomology and Parasitology.** (1-6; 1-6) Yr.
Mr. Craig, Mr. Essig, Mr. Freeborn, Mr. Freitag, Mr. Hoskins,
Mr. Linsley, Mr. Middlekauff, Mr. Michelbacher, Mr. Severin,
Mr. Steinhaus, Mr. Stewart, Mr. Usinger
- 202A-202B. **Seminar in Medical Entomology and Parasitology.** (1-1) Yr.
W, 4-6. Mr. Stewart
- 203A-203B. **Seminar in Insect Toxicology, Insect Physiology, and Insect Pathology.** (1-1) Yr. Tu, 4-6. Mr. Craig, Mr. Hoskins, Mr. Steinhaus

FOOD TECHNOLOGY

- 112A-112B. **Food Technology.** (3-3) Yr.
Mr. Cruess, Mr. Joslyn, Mr. Mrak, Mr. Phaff
Lectures, Tu Th, 9, and one other hour.
Prerequisite: Chemistry 1A-1B and Bacteriology 1. Course 112A is not prerequisite to 112B.
Physical, chemical, bacteriological, and economic principles and technological processes involved in the preparation, preservation, and examination of fruit and vegetable products including canned, dried, and fermented products.
- 115A-115B. **Food Technology.** (4-4) Yr.
Mr. Joslyn, Mr. Mackinney, Mr. Marsh, Mr. Vaughn
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5. Fee, \$6 a semester.
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, Miss Hohl, Mr. Phaff
Lectures, M F, 2; laboratory, M F, 3-5; W, 2-4.
Prerequisite: Chemistry 1A-1B, 5 and 8; Bacteriology 1 and 4; Botany 1A-1B, or 12.
Morphology, development and classification of yeasts; relation to other fungi; growth requirements; metabolic and other activities of yeasts including their zymological and industrial aspects.
- 127A-127B. **Proseminar in Food Technology.** (1-1) Yr. W, 4. Mr. Cruess
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.

GRADUATE COURSE

- 237A-237B. **Research in Food Technology.** (1-6; 1-6) Yr.
The Staff (Mr. Cruess in charge)

FORESTRY

Forestry 105A-105B is prerequisite to all courses which require senior standing. An average grade of C or higher in all work undertaken is prerequisite to all upper division courses in Forestry.

1. **Elements of Forestry.** (3) I. M W F, 11. Mr. Cockrell
Not open to students with a major in forestry.
Forests in their relation to national life. The life history of the tree and the forest. General principles of forestry.
100. **Introduction to Professional Forestry.** (3) I. M W F, 10. Mr. Mulford
Open only to students with a major in forestry.
The branches of forestry, their significance and relationships; values derived from forests; forest policy.
101. **Introduction to Range Management.** (3) II. M W F, 9. 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, F, 11; laboratory, W F, 2-5.
Prerequisites: Engineering 1A-1B; Chemistry 8; an elementary course in statistics; Forestry 103 or Botany 151. The additional prerequisite of Forestry 101 and Botany 108 may be taken concurrently.
Advanced work in range management. Special field trips will be arranged.
103. **Principles of Forest Ecology.** (3) I. M W F, 9. Mr. Baker
Prerequisite: Botany 1A-1B or 12, Chemistry 1A.
Structure of the plant as modified by conditions of habitat. Plant succession and societies.
104. **Silviculture.** (4) I. Mr. Baker
Lectures, M W F, 10; laboratory, S, 9-12, and two all-day field trips.
Prerequisite: Forestry 103, 105A-105B.
Methods of governing growth and reproduction of forests through the application of ecological laws.
- 105A. **Field Laboratory Course.** (No credit) Mr. Arnold
Prerequisite: Engineering 1A-1B, Forestry 103, 110.
Six weeks of summer camp at Meadow Valley, near Quincy, in the Plumas National Forest.
Field laboratory work in forest surveys and mapping, forest mensuration, silviculture, logging and milling operations.
- 105B. **Field Laboratory Course.** (No credit) Mr. Arnold
Prerequisite: Engineering 1A-1B, Forestry 103, 110.
Continuation of 105A. Six weeks at the summer camp, following 105A. 105A-105B is required of all students.
106. **Forest Planting.** (1) I. Tu, 10. Mr. Baker
Prerequisite: Botany 1A-1B or 12, Economics 1A-1B.
Artificial establishment of forests, from collection of seed to planting the trees, financial aspects of forest plantations.
107. **Forest Planting Laboratory.** (1) I. Tu, 2-5. Mr. Baker
Prerequisite: Botany 1A-1B or 12, Economics 1A-1B. Fee, \$2.50.
Limited to 25 students.
Laboratory exercises relating to the artificial establishment of forests.

108. **Dendrology.** (4) I. Mr. Cockrell
 Recitations, M W F, 8; laboratory, W, 1-4.
 Prerequisite: Botany 1A-1B or 12.
 Identification by gross characters of important forest trees of North America; their ecological and geographical distribution; character of wood.
110. **Forest Mensuration.** (3) II. Mr. Barr
 Lectures, Tu Th, 10; conference, M, 1-5.
 Prerequisite: a course in elementary statistics; 3 units of University mathematics.
 Statistical methods useful in analyzing forestry data; the measurement of timber in the log, the tree, and the stand; growth of trees and stands.
112. **Lumber Manufacturing.** (3) I. M W F, 9. 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, W F, 10; laboratory, W, 1-4.
 Prerequisite: Chemistry 1A and Botany 1A-1B or 12. Fee, \$2.50.
 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.
118. **Forest Engineering.** (3) II. Mr. Krueger
 Lectures, Tu Th, 11; laboratory, Tu, 1-4.
 Prerequisite: Engineering 1A-1B and Physics 2A-2B.
 Engineering methods involved in logging and forest management.
120. **Management of Forest Properties.** (4) II. Mr. Barr
 Lectures, Tu Th, 9; laboratory, W F, 2-5.
 Prerequisite: Forestry 104, 105A-105B, and 110.
 Organization of properties for forestry practice. Timber production as a business.
121. **Forest Economics.** (3) II. _____
 Lectures, M W, 11; conference, Th, 2-4.
 Prerequisite: six 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) II. M W F, 9. Mr. Mulford
 Prerequisite: six units of economics and senior standing.
 Forests in their relation to society. State and national forest policies.
123. **Range Utilization.** (3) II. M W F, 1. Mr. Sampson
 Prerequisite: Forestry 101, 102, and 103; Engineering 1A-1B; Botany 108 and 120A, and senior standing.
 Range use and forage valuations as integral parts of land use planning, including technical problems of range management.

- *125. **Forest Influences.** (3) I. Mr. Kittredge
Lectures, Tu Th, 11; laboratory or field trip, M, 1-4.
Prerequisite: Forestry 103, Physics 2A-2B, and senior standing. Recommended: Soil Science 100 and Geography 111.
The influences of forests and brush on soil moisture, run-off, stream flow, floods, erosion, local climate, and soil productivity for forest growth.
126. **Production Methods in the Forest Industries.** (3) II. M W F, 10. Mr. Krueger
Prerequisite: six units of economics and senior standing.
Production methods and principles involved in logging; cost analyses.
128. **Forest Protection** (2) II. Tu Th, 8. Mr. Arnold
Open only to students whose major is Forestry.
Forest fire control organization and equipment; methods of fire prevention and suppression; damage to forests and watersheds from fire and other destructive influences.
198. **Directed Group Study.** (1-5) I and II.
The Staff (Mr. Mulford in charge)
Prerequisite: senior standing, and approval of instructor.
Group study, or investigation, of special problems.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Mulford in charge)
Prerequisite: senior standing and approval of the instructor.
This course may also be taken during the summer at the Forestry Camp at Meadow Valley, Plumas County.

GRADUATE COURSES

- 201A-201B. **Seminar in Forestry.** (2-2) Yr. Mr. ———, Mr. Krueger
I (———); II (Krueger).
201A is not prerequisite to 201B.
- 202A-202B. **Research in Forestry.** (1-6; 1-6) Yr.
202A is not prerequisite to 202B. The Staff (Mr. Mulford in charge)
- 203A*-203B. **Seminar in Forest Influences and in Forest Ecology.** (2-2) Yr.
I (Kittredge); II (Sampson). Mr. Kittredge, Mr. Sampson
Prerequisite: plant physiology (3 units); Forestry 125 or 203A, Chemistry 8 and Forestry 103 for 203B. 203A is not prerequisite to 203B.
204. **Seminar in Silviculture.** (2) I. Mr. Baker
Prerequisite: Forestry 104.
205. **Seminar in Wood Technology.** (2) I. Mr. Cockrell
Prerequisite: Forestry 114.
Anatomy and properties of wood.
206. **Seminar in Forest Management.** (2) II. Mr. Barr
Prerequisite: Forestry 120, 6 units of economics.
- 207A-207B. **Seminar in Forest Economics.** (2-2) Yr. ———, Mr. Krueger
I (———); II (Krueger).
Prerequisite: 12 units of economics, agricultural economics, or forest economics. 207A is not prerequisite to 207B.
208. **Seminar in Range Management.** (2) II. Mr. Sampson
Prerequisite: Forestry 103, 123, plant physiology (3 units), Chemistry 8.

* Not to be given, 1946-1947.

GENETICS

100. **Principles of Genetics.** (4) I. Mr. Dempster
Lectures, M W F, 8; laboratory, F, 1-4. Fee, \$2.50.
Prerequisite: Botany 1A, Zoölogy 1A, and either Botany 1B or Zoölogy 1B; or Botany 12, 16, and Zoölogy 1A.
Introduction to genetics with some consideration of its applications in agriculture, biology, and human welfare.
101. **Cytogenetics.** (3) II. M W F, 8. Mr. Clausen
Prerequisite: Genetics 100 and general cytology.
Lectures and assigned reading, with reports on problems in plant cytogenetics. A laboratory course, Botany 131, may be taken concurrently.
102. **Advanced Genetics.** (3) I. Tu Th S, 9. Mr. Jenkins
Prerequisite: Genetics 100.
Genetics with special reference to methods. Intended to supplement course 100 for students whose major is genetics.
103. **Organic Evolution** (3) II. M W F, 9. Mr. Stebbins
Prerequisite: Genetics 100 or its equivalent.
The principles of evolution with particular reference to the evolutionary processes in plants.
104. **Nature and Function of Hereditary Materials.** (3) I. M W F, 10. Mr. 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.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Babcock in charge)

GRADUATE COURSES

- 200A-200B. **Research in Genetics.** (1-6; 1-6) Yr.
Mr. Babcock, Mr. Asmundson, Mr. Briggs, Mr. Clausen, Mr. Dempster, Mr. Gregory, Mr. Love, Mr. Olmo, Mr. Rick, Mr. Stebbins
- 201A-201B. **Seminar in Genetics.** (1-1) Yr. Tu, 4-6.
Reports and discussion. The Staff (Mr. Babcock in charge)

HOME ECONOMICS

NOTE.—See also the GENERAL CATALOGUE, DEPARTMENTS AT BERKELEY, for courses in the Home Economics curriculum.

Students must maintain at least a C average to qualify for enrollment in upper division courses in this department.

- 1A-1B. **Experimental Food Study.** (3-3) Yr. Miss Kennedy
Lecture, F, 2; laboratory, Sec. 1, M W, 2-5; Sec. 2, Tu Th, 1-4. Fee, \$8 per semester.
Prerequisite: Chemistry 1A and 8. Recommended, Bacteriology 1, 4.
Production and composition of food and principles involved in food preparation and preservation.

5. **Elementary Clothing Study.** (3) I. Miss McClelland
Lecture, F, 9; laboratory, Sec. 1, M W, 9-12; Sec. 2, Tu Th, 1-4; Fee, \$2.50.
Prerequisite: Decorative Art 16A-16B.
Practical and cultural problems in modern garment design and construction.
7. **Introduction to Textiles.** (3) II. Miss McClelland
Lectures, M W, 9; laboratory, Sec. 1, F, 9-12; Sec. 2, F, 2-5. Fee, \$2.50.
Prerequisite: Chemistry 1A and 8.
Study of plant, animal and synthetic fibers used in textiles and of the finished textile materials.
10. **Nutrition.** (2) I and II. Mrs. Cook
I: M W, 4; II: Tu Th, 4.
A nontechnical presentation of the modern knowledge of foods and nutrition.
14. **Consumer Problems.** (2) II. Miss Coles
Lectures, M W, 4.
A nontechnical discussion of consumers' problems.

FOOD ECONOMICS AND TECHNOLOGY

100. **Food Economics.** (3) I. Miss Coles
Lectures, Tu Th, 1; field or laboratory work: Sec. 1, M, 1-4; Sec. 2, Th, 2-5. Estimated cost of field trips, \$1.
Prerequisite or concurrent: Home Economics 141.
Field observation of manufacturing and distribution to observe practices related to problems of consumers including those buying foods in large quantities.
- 101A. **Food Analysis.** (3) I. Miss Kennedy
Lecture, Tu, 8; laboratory, Tu Th, 9-12. Fee, \$8.50.
Prerequisite: courses 1A-1B, Chemistry 1B and 8; or Chemistry 1B and 8 with grade of A or B.
The principles of quantitative analysis applied to food materials; chemical analysis of typical carbohydrate, fat and protein foods.
- *101B. **Advanced Food Analysis.** (3) II. Miss Kennedy
Lecture, Tu, 10; laboratory, Tu Th, 2-5. Fee, \$8.50.
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.
125. **Recent Advances in Food Technology.** (2) II. S, 9-11. 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, 1946-1947.

NUTRITION

- 102A-102B. **Food and Dietetics.** (3-3) Yr. Miss Okey
Lectures, M W, 1; laboratory, F, 1-4. Fee, \$4 per semester.
Prerequisite: Chemistry 1A and 8, Physiology 1A, and Home Economics 1A-1B.
The food requirements of the normal individual and the special needs imposed by growth, pregnancy, lactation, and disease. The planning and computation of diets.
103. **Elementary Nutrition.** (3) I. M W F, 10. 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 of Home Economics.)
106. **Laboratory Methods in Metabolism.** (3) II. Miss Okey
Lecture, Tu 10; laboratory, M W, 2-5. Fee, \$8.50.
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
Lectures, Tu Th, 11; laboratory, M W, 9-12. For 120B there is an additional laboratory period, F, 1-4. Fee, \$8.50 per semester.
Prerequisite: course 101A and Biochemistry 103, or courses 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, Tu Th, 9; laboratory and field work, F, 9-12.
Prerequisite: course 120A or Biochemistry 103. The lectures may be taken separately with a credit value of two units.
The chemistry and physiology of intrauterine development, lactation, and growth; normal and subnormal nutrition in infancy and childhood; practice in the solution of feeding problems.
196. **Dietary Problems.** (3) II. Mrs. Cook
Lectures, M W, 8; laboratory, F, 9-12. Fee, \$2.50.
Prerequisite or concurrently taken: courses 120A-120B.
Problems in the planning and computation of dietaries for normal and pathological conditions.

INSTITUTION ECONOMICS

110. **Institution Food Study.** (4) II. Miss Gillum
Lectures, Tu Th, 2; field or laboratory, S, 9-12, and three 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.

* Not to be given, 1946-1947.

111. **Institution Organization and Management.** (3) I. Miss Gillum
Lectures, Tu Th, 10; field or laboratory work, S, 9-12.
Prerequisite: Home Economics 110 or permission of instructor. Recommended: Business Administration 6A, 151 or Psychology 3 or 185.
The principles and problems involved in the organization and management of institution households such as residence halls, hospitals, hotels.
- 198A-198B. **Proseminar in Hospital Dietetics.** (2-2) Yr. W, 2:30-4:30.
Open only to selected graduate students. Miss Gillum
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 Coles
Lectures, Tu Th, 9; laboratory, Tu, 1-4.
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 Coles
Prerequisite or concurrent: Home Economics 140. Laboratory which includes living for 6 to 8 weeks in the home management house under supervision of the instructor. A two-hour weekly conference to be arranged. A fee is required to cover cost of food, lodging, and laundry.
141. **Consumers and the Market.** (3) I. M W F, 8. Miss Coles
Prerequisite or concurrent: Economics 1A-1B. Not open to students who are taking or have taken Agricultural Economics 101A or Business Administration 123.
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.
142. **Social Problems of Families.** (3) II. M W F, 9. Miss Coles
Prerequisite: Economics 1A-1B, and either Economics 40 or Psychology 5.
Present-day problems of families as they are related to economic and social conditions.
144. **Family Finance.** (3) I. M W F, 9. Miss Coles
Prerequisite: Economics 1A-1B, and either Economics 40 or Psychology 5.
Management of personal and family finances—money income, household production, planning expenditures, credit, savings, investments, financing home ownership.

CHILD DEVELOPMENT

132. **Child Development.** (3) I. M W F, 8. 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) I and II. Miss Landreth
M, 4, and hours 9-12, to be arranged one day a week.
Prerequisite: course 132.
Laboratory supplement to course 132 conducted at the nursery school.
134. **Child Care and Family Health.** (3) II. M W F, 11. Miss Landreth
Prerequisite: Physiology 1A.
A consideration of the physical development of children from prenatal through adolescent life and the factors affecting health during this period.
135. **Techniques with Young Children.** (3) I and II. Miss Landreth
Lectures: Tu Th, 8; laboratory in the nursery school two mornings or two afternoons a week.
Prerequisite: courses 132 and 133, or Psychology 112 and 172.
435. **Nursery School Administration.** (3) II. Miss Landreth
Lectures, Tu Th, 9; 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.

TEXTILES AND CLOTHING

- *160. **Textiles.** (3) I. _____
Lectures, Th, 1; laboratory, Tu, 1-4, Th, 2-5.
Prerequisite: Home Economics 7.
Technical analyses and evaluations of textile fibers and fabrics.
162. **Clothing Economics.** (3) I. Miss McClelland
Lectures, M W, 11; laboratory, W, 1-4.
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.
167. **Clothing Design and Construction.** (3) I. Miss McClelland
Lecture, M, 8; laboratory, Tu Th, 9-12. Fee, \$2.50.
Prerequisite: Home Economics 5 and 7.
Theory and practice of costume design and construction.

HOME FURNISHING

190. **Home Furnishing.** (3) II. Mr. Sands
Lectures, Tu Th, 10; laboratory, Th, 1-4.
Prerequisite: Decorative Art 16A-16B, 130A-130B. One of the latter may be taken concurrently.
A nonprofessional course designed to develop discrimination in values. A consideration of materials involved in furnishing the home and their use, and an analysis of current trends and available materials.

* Not to be given, 1946-1947.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mrs. Morgan in charge)

GRADUATE COURSES

214. **Research in Food and Nutrition.** (2-6) I and II.
The Staff (Mrs. Morgan in charge)
216. **Seminar in Foods** (2) I. M, 4-6. Miss Okey
219. **Seminar in Nutrition.** (2) II. Tu, 4-6. 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. Th, 4-6. Miss Coles

HORTICULTURE

- *2. **Fruit Growing.** (3) I. Tu Th, 11, Th, 1. Mr. R. M. Brooks
Prerequisite: Botany 1A or 12.
Fruit growing practices; propagation, planting, and culture of orchard trees, and small fruits.

LANDSCAPE DESIGN

Art 2A-2B, Botany 12, Architecture 1, Engineering 21, Landscape Design 1A-1B, and 2, are prerequisite to all upper division courses in Landscape Design.

- 1A-1B. **The Theory and Aesthetics of Landscape Design.** (3-3) Yr.
Lectures, M W, 10; laboratory, S, 9-12. Mr. Gregg
The different styles of landscape art and principles governing correct design.
2. **History and Literature of Landscape Design.** (2) II. Mr. Vaughan
M W, 11. Limited to major students only.
Early influences and their effect on modern practice.
49. **Summer Practice and Observation Course.** (No credit)
The Staff (Mr. Gregg in charge)
Students may register for this course at the end of the junior year.
- 101A-101B. **Elementary Landscape Design.** (3-3) Yr. Mr. Vaughan
Lecture, M, 10; laboratory, W, 8-11, 1-4.
Elementary problems in landscape design.
- 111A-111B. **Landscape Design and Construction.** (4-4) Yr. Mr. Vaughan
Lecture, W, 10; laboratory, Tu, 3-6, F S, 8-11.
Problems of design and construction with special reference to grading, retaining walls, steps, pools, pergolas, irrigation and drainage systems; reports and estimates.
- 112A-112B. **Plant Materials.** (3-3) Yr. Mr. Shepherd
Lecture, Tu, 8; laboratory, Tu, 9-12, Th, 8-11.
The form, habit, texture, and adaptation of trees, shrubs, vines, and herbaceous plants.

* Not to be given, 1946-1947.

- 113A-113B. **Plant Materials.** (3-3) Yr. Mr. Shepherd
Lecture, W, 1; laboratory, M, 1-4, W, 2-5.
Advanced study of plant adaptations and their landscape values, and planting design.
- 114A-114B. **Advanced Landscape Design.** (4-4) Yr. Mr. Gregg
One lecture period to be arranged; laboratory, I: Tu Th, 3-6; F S, 9-12; II: Tu, 3-6, Th, 1-4, F S, 9-12.
Problems of design and reconstruction from topographic surveys as provided by the larger areas of parks, playgrounds, and country estates, with detailed plans, reports, and estimates.
- 115A-115B. **City and Town Planning.** (4-4) Yr.
The Staff (Mr. Gregg in charge)
Lectures, M W, 11; laboratory, Tu Th, 8-11.
Fundamental principles on which the functional planning of a city or town are based.
116. **Site Planning.** (3) II. Mr. Vaughan
One lecture and 2 three-hour laboratory periods to be arranged.
Prerequisite: junior standing.
A study of the development of irregular topography for building groups and their attendant outdoor elements. Restricted to students in Architecture and Landscape Design.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Gregg in charge)

GRADUATE COURSE

- 201A-201B. **Modern Civic Art.** (1-6; 1-6) Yr.
Hours to be arranged. The Staff (Mr. Gregg in charge)
Advanced problems in design with special reference to city parks, municipal park systems, recreation areas, civic centers, and other civic features in their relation to the city plan as a whole.

PLANT NUTRITION

(For courses in Plant Nutrition, see Soil Science.)

PLANT PATHOLOGY

- Botany 1A-1B, or 12 and 16, and Bacteriology 1 are prerequisite to course 120. Course 120 is prerequisite to all subsequent courses in plant pathology.
100. **Forest Pathology.** (3) II. Mr. Hansen
Lectures, M F, 11; laboratory, Sec. 1, F, 1-4; Sec. 2, S, 9-12. Fee, \$2.50.
Prerequisite: Botany 1A-1B. Restricted to Forestry students.
Diseases of forest plants.
- Mycology.** (See Botany 101 and 102.)
120. **Plant Diseases.** (4) I. Mr. Barrett, Mr. Yarwood
Lectures, Tu Th, 8; laboratory, Tu Th, 9-12. Fee, \$2.50.
A general course on the nature, cause, and control of plant diseases.

121. **Technique of Plant Pathology.** (2) II. Mr. Rawlins
Laboratory, Tu Th, 1-4. Fee, \$2.50.
(a) Histology; culture methods; interpretation of data; virus 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 1946-1947.
123. **Principles of Plant Pathology.** (2) II. Tu Th, 10. Mr. Thomas
The fundamental concepts concerning the causes, nature, spread and control of disease in plants. Nature of parasitism, pathogenesis, susceptibility, and resistance.
125. **Diseases of Truck and Field Crops.** (2) I. Mr. Gardner
Laboratory, M W, 1-4.
The pathology of important crop plants. Dissemination, factors influencing inception and severity of disease, diagnosis, host reaction, control.
NOTE.—This course is given in alternate years. To be given at Berkeley, 1946-1947.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Barrett, Mr. Gardner, Mr. Hansen, Mr. Rawlins,
Mr. Thomas, Mr. Snyder, Mr. Ark, Mr. Yarwood

GRADUATE COURSES

- 201A-201B. **Seminar in Plant Pathology.** (1-1) Yr. M, 4-5.
The Staff (Mr. Thomas in charge)
- 230A-230B. **Research in Plant Pathology.** (1-6; 1-6) Yr.
Mr. Gardner, Mr. Barrett, Mr. Hansen, Mr. Rawlins, Mr. Snyder,
Mr. Thomas, Mr. Tompkins, Mr. Ark, Mr. Yarwood

POMOLOGY

(For courses in Pomology, see Horticulture.)

POULTRY HUSBANDRY

1. **Poultry Production.** (3) I. Mr. Lerner, Mr. Grau
Lectures, Tu Th, 10; laboratory, to be arranged. Fee, \$3.50.
An introductory study of the relation of the several sciences underlying poultry production to poultry husbandry practice.
102. **Experimental Incubation.** (3) II. Mr. L. W. Taylor
Lectures, Tu Th, 9; one laboratory period to be arranged. Fee, \$3.50.
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. M W F, 10. Mr. Lerner, Mr. L. W. Taylor
Prerequisite: Genetics 100.
Inheritance of characters in poultry and study of the application of genetic principles to problems in poultry breeding.
104. **Poultry Feeds and Feeding.** (2) I. Tu Th, 11. Mr. Lepkovsky
Prerequisite: Poultry Husbandry 106 (completed or in progress).
A study of the manufacture, composition, and use of poultry feedstuffs.

106. **Principles of Animal Nutrition.** (3) I. M W F, 9. Mr. Lepkovsky
Prerequisite: Chemistry 8, Zoölogy 1B, Physiology 1A, 1C, or Animal Husbandry 110.

The fundamentals of metabolism, maintenance, growth, and reproduction; chemistry and digestion of the proteins, carbohydrates, and fats; functions of minerals, vitamins, and water.

NOTE.—This course may be elected by students in the Curriculum of Animal Science on the Berkeley campus.

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 (I, Mr. Lerner; II, Mr. L. W. Taylor)

Prerequisite: Poultry Husbandry 1, courses basic to problems elected, and consent of 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. Lepkovsky, Mr. Lerner

SOIL SCIENCE

No student will be accepted as a major student in soil science who has not attained at least a C average 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

Lectures, M W F, 11; laboratory, M, 1-4. Fee, \$2.50.

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.** (4) II. Mr. Jenny

Lectures, M W F, 10; one unit field work.

Prerequisite: Geology 1A; Chemistry 1A-1B. Soil Science 100, recommended.

Influence of climate, vegetation, parent material, topography, and time on soil development; chemistry of soil formation; classification of soils; relationships between soil groups and agricultural use; developed and illustrated by a critical study of representative soils of the world.

102. **Soil Physics.** (2) II. Mr. Bodman

Lectures, Tu Th, 9.

Prerequisite: Soil Science 100, including laboratory sections; calculus (Mathematics 3A-3B). Recommended: physical chemistry.

The physical properties of soils and their measurement. If possible course 102L should be taken concurrently.

- 102L. **Soil Physics.** (2) II. Mr. Bodman, Mr. Day
 Laboratory, Tu Th, 2-5. Fee, \$3.50.
 Prerequisite: Soil Science 102. May be taken concurrently.
 Laboratory experiments designed to accompany Course 102.
103. **Soils of California.** (3) I. Mr. Storie
 Lectures, Tu Th, 10; discussions, Sec. 1, Tu 11; Sec. 2, Th, 8; Sec. 3, Th,
 11. 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 identify-
 ing, rating and judging the probable agricultural value of the important
 soils in California.
105. **Summer Field Course.** (6) Six weeks, daily, 8-5. Mr. Storie
 Prerequisite: Soil Science 100 and 101, or 103, and approval of instruc-
 tor in charge.
 Methods of mapping and classifying soils; the preparation of soil re-
 ports; field work in soil surveying and field studies of the profiles of repre-
 sentative California soils.

SOIL CHEMISTRY, SOIL MICROBIOLOGY AND PLANT NUTRITION

110. **The Soil as a Medium for Plant Growth.** (4) I. Mr. Stout
 M W F, 9, and one other hour to be arranged.
 Prerequisite: Chemistry 1A-1B, 8.
 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.** (3) II. Mr. Barker
 Lecture, W, 1; laboratory, W, 2-5, F, 1-4. Fee, \$14.
 Prerequisite: Chemistry 5 and 8, Bacteriology 1 and 4.
 The role of microorganisms in nature, particularly in relation to agri-
 culture.
112. **The Soil as a Medium for Plant Growth.** (2) II. Mr. Stout
 Lectures and conferences, Tu Th, 10.
 Prerequisite: Soil Science 110.
 Soil conditions as phenomena and in relation to factors influencing fer-
 tility; 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. Stout
 Laboratory, M F, 1-4. Fee, \$11.50.
 Prerequisite: Chemistry 5, Soil Science 112, to be taken concurrently.
114. **Properties of Colloids.** (3) II. M W F, 11. Mr. Jenny
 Prerequisite: physical chemistry.
 Properties of colloidal systems of importance in agriculture and biology.
 Chemistry and physics of surfaces (adsorption, ion interchange), electric
 double layer, flocculation, Brownian movement, colloid optics, viscosity,
 swelling.

115. **Mineral Nutrition of Plants.** (2) II. Tu Th, 11.

Mr. Hoagland, Mr. Arnon

Prerequisite: Botany 120A-120B (Botany 120B may be taken concurrently).

Designed for students in soil science and certain other curricula in agriculture and for students in botany. Among the principal subjects of discussion are the following: nutrient medium in relation to inorganic and organic composition of plants; nitrogen metabolism; deficiency diseases; effects of inorganic elements on physiological processes; toxicities of mineral elements; certain relations of plant nutrition to animal nutrition; special phases of absorption and accumulation of mineral elements, including methods of experimentation.

*116. **Soil Management.** (2) I. Tu Th, 9.

Mr. Jenny in charge

Prerequisite: Soil Science 110.

Lectures by several specialists on the nature, use, and application of fertilizers; cover crops, crop rotation; tillage; and such other subjects as are particularly pertinent to California conditions.

GENERAL SOIL SCIENCE

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.Mr. Bodman, Mr. Day, Mr. Hoagland, Mr. Jenny, Mr. Kelley,
Mr. Barker, Mr. L. E. Davis, Mr. Stout

Open only to students with an average grade of B or better, and subject to approval of the undergraduate adviser in Soil Science.

GRADUATE COURSES

201A-201B. **Research in Soil Science.** (1-6; 1-6) Yr.Mr. Bodman, Mr. Hoagland, Mr. Jenny, Mr. Kelley, Mr. Arnon,
Mr. Day, Mr. Barker, Mr. L. E. Davis, Mr. Stout*235. **Seminar.** (1) I. M, 4.

Mr. Jenny

Prerequisite: graduate standing in soil science, plant physiology, or related subjects.

*236A-236B. **Staff Seminar in Soil Science.** (No credit)

The Staff

SOIL TECHNOLOGY

(For courses in Soil Technology, see Soil Science.)

SUBTROPICAL HORTICULTURE

For announcement of courses in this field, see under Horticulture in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE or in the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES.

TRUCK CROPS

1. **Vegetable Production.** (3) II.

Mr. MacGillivray

Tu, 11, 2; Th, 11.

Principles involved in vegetable production; survey of the vegetable industry.

NOTE: Given in the spring semesters of odd years.

* Not to be given, 1946-1947.

VETERINARY SCIENCE

The instruction in veterinary science does not prepare for the practice of veterinary medicine. The undergraduate courses are designed to supplement the instruction in animal husbandry, poultry husbandry, dairy industry, parasitology, and public health. Advanced students or graduates may undertake special studies in animal pathology and bacteriology. Graduates who can satisfy the requirements of general and special training may pursue studies leading to the M.S., and Ph.D. degrees in the field of Comparative Pathology.

101. Poultry Hygiene. (2) II.

Mr. DeOme

Laboratory, M W, 2-5. Given each fourth semester.

Prerequisite: Bacteriology 1 and 4 (completed or in progress) or Bacteriology 1 (Davis); Physiology 1A and 1C or Animal Husbandry 110 (Davis).

A study of the principles and measures for the maintenance of health of poultry.

NOTE.—This course in addition to Entomology 117 meets the requirement of parasitology and animal pathology in the Animal Science Curriculum for poultry majors resident at Berkeley.

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

Mr. Haring, Mr. Traum, Mr. Schalm, Mr. DeOme

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. Haring, Mr. Traum, Mr. Schalm, Mr. DeOme

NOTE.—Research in poultry diseases may be elected in the above courses.



FIELD LABORATORY EXERCISE ON THE DAVIS CAMPUS

1946-1947

**COURSES OF INSTRUCTION
OFFERED AT DAVIS**

COURSES OFFERED ON THE DAVIS CAMPUS

AGRICULTURAL CHEMISTRY

GRADUATE COURSES

200A-200B. Seminar in Agricultural Chemistry. (1-1) Yr.

The Staff (Mr. Young in charge)

Members of the Group in Agricultural Chemistry at Davis.†

One seminar is offered during each semester. One weekly meeting is held. The subject will vary from semester to semester and will be announced at the beginning of the semester.

201A-201B. Research in Agricultural Chemistry. (1-6; 1-6) Yr.

The Staff (Mr. Young in charge)

Members of the Group in Agricultural Chemistry.†

The research work will ordinarily be under the direction of a member of the instructing staff, who is in the field of agriculture in which the student's preparation has been found to be adequate.

AGRICULTURAL ECONOMICS

An average grade of at least C in all work undertaken is prerequisite to all upper division courses in agricultural economics.

101A. Principles of Marketing Agricultural Products. (3) II. M W F, 11.

Prerequisite: Economics 1A-1B.

Nature of the problems, types of marketing agencies, principal marketing functions and their combination, marketing costs and margins, price quotations and speculation in farm products. Government in its relation to marketing; consideration of proposals for improvement.

*104. Agricultural Economics. (3) I. Tu Th, 10, and one hour to be arranged.

Prerequisite: Economics 1A-1B.

A study of the application of the principles of economics to the problems of agriculture.

118. Farm Organization. (3) I. Tu Th, 10, Th, 1.

Mr. Adams, ———

The place, purpose and scope of organization; farm enterprise; select farms; planning and equipping; capital needs; earnings.

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

The Staff (Mr. Wellman in charge)

Prerequisite: senior standing and approval of the Division.

AGRICULTURAL ENGINEERING

6. Introduction to Surface Climatology. (2) I. Tu Th, 8. Mr. F. A. Brooks

Prerequisite: high school physics.

Atmospheric and thermal environment of life and structures near the earth's surface. Includes elementary meteorology and treats briefly: diurnal heat flow, cold-air drainage, and frost protection; outdoor condensation and evaporation; dispersion of moisture, gases, insecticides and spores.

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

* Not to be given, 1946-1947.

12. Survey and Problems in Agricultural Engineering. (2) II. M W, 9.

Mr. Walker, Mr. Bainer

The development and the application and use of farm machinery; the utilization of power on the farm; elements of hydrology in relation to agricultural engineering; the economics of farm buildings; elementary problems in the mechanics of agriculture.

14A-14B. Farm Mechanics for Teachers. (2-2) Yr.

Mr. Walker, Mr. Lewis, Mr. Belton

Laboratory, M F, 1-4. Fee, \$2.50 a semester.

Selection, use and care of tools and shop equipment. Practice in the application of mechanical principles to the maintenance and repair of farm buildings, farm machinery and farm power. Demonstration of methods. A demonstration and laboratory course for majors in agricultural education.

49. Summer Field Practice. (6) The Staff (Mr. Walker in charge)

Six weeks course, daily except Sunday, 8-5. Fee, \$12.

Practice in the mechanics, machinery, power, and building laboratories; study of equipment on typical farms. Smith-Hughes or prospective teachers of farm mechanics will find this a valuable course. It should be taken after the sophomore or junior year. Offered regularly in alternate years and other years when enrollment justifies.

NOTE.—Physics 1A-1B, or 2A-2B is prerequisite to all upper division courses in agricultural engineering.

102. Unit Operations in Processing Agricultural Products. (3) II.

Lectures, Tu Th, 8; laboratory, W, 1-4. Fee, \$2.50.

Mr. Perry

Theory of refrigeration, steam, electricity, and hydraulics and their application to the processing of dairy, meat, fruit and vegetable products.

103. Agricultural Power. (3) II.

Mr. Moses

Lectures, Tu Th, 11; laboratory, Sec. 1, M, 1-4; Sec. 2, F, 1-4. Fee \$2.50.

Theory of operation, construction, and utilization of internal combustion engines, tractors; electric motors and appliances; steam boilers and engines; water wheels. Open to qualified lower division students by permission.

104. Agricultural Machinery. (3) I.

Mr. French

Lectures, Tu Th, 9; laboratory, Sec. 1, W, 1-4; Sec. 2, S, 9-12. Fee, \$2.50.

Construction, operation, requirements, and utilization of tillage, seeding, harvesting, belt-operated farm machinery and pest-control equipment; theory and testing of displacement and centrifugal pumps.

105. Farm Structures. (3) I.

Mr. Neubauer

Lectures, Tu Th, 11; laboratory, Sec. 1, W, 1-4; Sec. 2, Th, 1-4. Fee, \$2.50.

A course in agricultural housing, including structural materials and methods of construction; design of typical farm dwellings, storage buildings, and production structures; farmstead utilities; farmstead arrangement; plans, specifications, contracts and cost estimating.

Courses 113, 114, 115, and 130 are designed for students in the College of Engineering whose major is agricultural engineering; they are not open to students in the College of Agriculture.

113. **Agricultural Power.** (4) II. Mr. Moses
Lectures, Tu Th, 10; laboratory, Tu Th, 1-4. Prerequisite: Mechanical Engineering 105A-105B. Fee, \$2.50.
The study of the different types of internal combustion engines, their accessories and fuels used for stationary and mobile power on the farm; the construction, operation and testing of farm tractors, and the application of electric heat, light and power to agricultural operations.
114. **Agricultural Machinery.** (3) I. Mr. Bainer
Lectures, M F, 11; laboratory, F, 1-4. Prerequisite: Mechanical Engineering 102A-102B. Fee, \$2.50.
The requirements and design of farmstead and field implements; theory of operation and testing of displacement and centrifugal pumps; field and laboratory studies of representative types of draft and belt-operated farm machines, together with their cost, selection, power requirements, and management.
115. **Farm Structures Design.** (3) I. Mr. Walker, Mr. Neubauer
Lectures, Tu Th, 9; laboratory, Tu, 1-4. Prerequisite: Mechanical Engineering 102A-102B. Fee, \$2.50.
The design of farm buildings including houses, storage buildings, and production structures with emphasis on functional requirements and characteristics of materials. Study of the principles of lighting, air conditioning, water supply, and sanitation.
130. **Proseminar.** (1) II. The Staff (Mr. Walker in charge)
Hour to be arranged.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Walker in charge)

GRADUATE COURSE

- 200A-200B. **Research in Agricultural Engineering.** (1-6; 1-6) Yr.
Mr. Walker, Mr. Bainer, Mr. Boelter, Mr. F. A. Brooks, Mr. Young,
Mr. Moses, Mr. Neubauer, Mr. Perry, Mr. Howe, Mr. French

MECHANICAL ENGINEERING

151. **Industrial Heat Transfer.** (3) I. M W F, 8.
Mr. Perry, Mr. F. A. Brooks
Prerequisite: Mechanical Engineering 105A-105B or equivalent.
The application of the basic theory of the transfer of thermal and radiant energy to the design of industrial equipment.
152. **Mass Transfer in Industrial Equipment.** (3) II. M W F, 8.
Mr. Perry, Mr. F. A. Brooks
Prerequisite: Mechanical Engineering 105A-105B or equivalent. Mechanical Engineering 151 recommended.
Application of thermodynamic, heat, and mass transfer considerations to industrial equipment using fundamental processes, such as evaporation, drying, absorption, diffusion, combustion, and distillation.
Advanced problems in mechanics and thermodynamics. (See Mechanical Engineering 218 and 267, given at Berkeley.)

AGRONOMY

1. **Introduction to Agronomy.** (3) I. _____
Lectures, Tu Th, 8; laboratory, F, 1-4.
The principles of soil management and field crop production. History, survey, production methods, and major uses of the field crops of California. Required of all majors in Agronomy.
110. **Principles of Crop Production.** (3) I. M W F, 10. Mr. Madson
Prerequisite: Chemistry 1A-1B, 8, Botany 1A.
The relation of environment to the distribution and utilization of field crops. The theory of soil management and improvement, fertilization, rotation, erosion control, tillage, and other practices relating to the production of field crops.
111. **Field Crops.** (3) I. Mr. Madson, _____
Lectures, Tu Th, 10; laboratory, Tu, 1-4.
Prerequisite: Botany 1A. Fee, \$2.50.
Adaptation, distribution, and utilization of the major field crops, including legumes, cereals, and other cultivated grasses, fiber, sugar, and oil plants.
112. **Field Crop Technology.** (3) II. _____
Lectures, Tu Th, 8; laboratory, Tu, 1-4. Fee, \$2.50.
Prerequisites: Agronomy 110, 111.
The utilization of field crops; the factors determining quality and value, a study of the market grades, and the processes of manufacture.
114. **Plant Breeding.** (3) II. Mr. Briggs
Lectures, M W, 10; laboratory, M, 1-4.
Prerequisites: Genetics 100, Agronomy 111, or Botany 110B, or Truck Crops 105.
The application of genetics to the problems and methods of plant improvement.
115. **Range and Forage Crops.** (3) II. Mr. Love, Mr. Beetle
Lecture, F, 10; laboratory, Tu Th, 1-4.
Prerequisite: Agronomy 111.
Adaptation, distribution, and utilization of the more important forage and grazing plants, with special emphasis on their systematic relationships. Principles of the establishment and management of ranges and irrigated pastures.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (Mr. Madson in charge)
Prerequisite: six upper division units of agronomy.

GRADUATE COURSE

- 200A-200B. **Research in Agronomy.** (1-6; 1-6) Yr.
Mr. Beetle, Mr. Briggs, Mr. Conrad, Mr. Love, Mr. Madson,
Mr. Stanford, Mr. Allard, Mr. Laude

ANIMAL HUSBANDRY

NOTE.—Animal Husbandry 7 and 8 are required of all students whose major is Animal Husbandry.

7. **Introduction to Animal Husbandry.** (3) I. M W F, 11. Mr. Hughes
A survey of the sources of the world's supply of animal products, the distribution of domestic animals in the United States and factors influencing this; the origin, characteristics, and adaptation of the more important breeds and the influence of environment upon their development.
8. **Livestock Judging and Selection.** (2) I. Mr. Hughes
Sec. 1, lecture, W, 1; laboratory, W, 2-5; Sec. 2, lecture, S, 8; laboratory, S, 9-12.
The animal form in relation to its various functions.
101. **Animal Biochemistry.** (3) II. M W F, 8. Mr. Goss
Prerequisite: Chemistry 8.
The chemistry of animal food constituents, tissues, hormones, and excretory products; chemistry of enzymes and digestion; the fate of food-stuffs in metabolism; survey of fundamentals of blood chemistry.
102. **Animal Biochemistry Laboratory.** (2) II. Tu Th, 1-4. Mr. Goss
Prerequisite: Chemistry 8.
103. **Livestock Feeds and Feeding.** (3) I, Tu Th S, 8. Mr. Miller
Prerequisite: Animal Husbandry 101 or Poultry Husbandry 106.
The composition and use of feedstuffs in their relation to the feeding of farm animals, including the selection of rations.
107. **Breeding Farm Animals.** (2) II. Tu Th, 8. Mr. Hart
Prerequisite: Genetics 100.
Underlying principles: inbreeding, line-breeding, and outcrossing; blood lines and pedigrees of famous animals; successful methods of producing purebred stock.
108. **Milk Production.** (4) II. Mr. Regan, Mr. Ralston
Lectures, M W F, 10; laboratory, M, 1-4.
Prerequisite: Animal Husbandry 103.
Study of the applications of the principles of heredity, nutrition, and physiology to the problems of breeding, feeding, and management of dairy cattle. Judging of dairy cattle; principles of sanitation.
110. **Physiology of Domestic Animals.** (5) I. Mr. Cole
Lectures, M Tu W Th, 10; laboratory, Sec. 1, M, 1-4; Sec. 2, Tu, 1-4.
Fee, \$3.50.
Prerequisite: Chemistry 1A-1B; Zoölogy 1A-1B.
The physiology of the neuromuscular, central nervous, circulatory, respiratory, digestive, endocrine, reproductive and excretory systems.
111. **Advanced Livestock Judging.** (2) I. Mr. Hughes
Laboratory, W, 1-4, S, 9-12.
Prerequisite: Animal Husbandry 7 and 8.
The relation of form to function and training in the selection of beef cattle, sheep, hogs, and horses.
112. **Advanced Dairy Cattle Production.** (2) I. Mr. Mead, Mr. Regan, Mr. Ralston
Laboratory, Tu Th, 1-4. Prerequisite: Animal Husbandry 108.
A study of the factors involved in developing successful breeding and management programs. The relation of form to function.

- 113. Wool Technology. (3) II.** Mr. J. F. Wilson
Lectures, Tu Th, 11; laboratory, S, 9-12.
Prerequisite: Animal Husbandry 7 and 8, and Genetics 100.
A survey of world production and consumption of wool; a study of the physical structure and properties of wool and other textile fibers; preparation and marketing of the clip; determination of wool values; grading, scouring, drying; principles of manufacture.
- 115. Horse Production. (3) II.** M W F, 9. Mr. Howell
Care, feeding, management, and problems of production of all classes of horses. Developing successful breeding programs. The use of horses for power and pleasure.
- 118. Meat Production. (4) II.** Mr. Guilbert
Lectures, M W F, 8; laboratory, S, 9-12.
Prerequisite: Animal Husbandry 103.
The relation of natural environment, heredity, nutrition, and physiology to breeding, feeding, and management of meat-producing animals and to the quality of meat products; with study of the economic phases of meat distribution.
- Animal Parasites and Diseases.** (See Veterinary Science 111 and Entomology 116.)
- 120. Animal Nutrition. (3) I.** M W F, 11. Mr. Kleiber
Prerequisite: Animal Husbandry 101.
Physical, chemical, and physiological aspects of total starvation, partial starvation (dietary deficiencies), and abundant food intake. Relation of food intake to essential animal functions, particularly metabolism, growth, reproduction, lactation, and work. Food utilization and food value.
- 199. Special Study for Advanced Undergraduates. (1-5) I and II.**
The Staff (Mr. Hart in charge)

GRADUATE COURSES

- 200A-200B. Research in Animal Husbandry, Animal Nutrition, Animal Physiology, or Animal Genetics. (1-6; 1-6) Yr.**
Mr. Hart, Mr. Cole, Mr. Gregory, Mr. Howell, Mr. Hughes, Mr. Kleiber, Mr. Miller, Mr. Regan, Mr. Storer, Mr. J. F. Wilson, Mr. Goss, Mr. Guilbert, Mr. Mead.
- 201A-201B. Seminar in Animal Nutrition, Animal Physiology, or Animal Genetics. (1-1) Yr.**
The Staff (Mr. Hart in charge)

BACTERIOLOGY

- 1. General Bacteriology. (4) II.** Mr. Mudge
Lectures, M W, 10; laboratory, M W, 1-4.
Prerequisite: Chemistry 1A. Fee, \$14.50.
Morphology, classification, ecology, and metabolism of microorganisms; preparation of culture media; microscopic examination, cultivation, and identification of bacteria; introduction to microbiology of air, water, soil, foods (including milk), industrial processes, and certain human, animal, and plant diseases.

BOTANY

1A-1B. General Botany. (4-4) Yr.

Mr. Crafts, Mr. Robbins, Mr. Weier, ———

Lectures, Tu Th, 10; laboratory, Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4; Sec. 3, W, 1-4, S, 9-12. Fee, \$4.50 a semester.

The fundamentals of morphology and physiology of roots, stems, leaves, flowers, fruits and seeds.

The second half-year consists of a survey of plant groups.

7. Plant Physiology. (4) II.

Mr. Crafts

Lectures, M W F, 9. Demonstration period to be arranged. Fee, \$3.50.

Prerequisite: Botany 1A-1B; Chemistry 1A-1B.

The fundamental activities of plants, such as absorption, transpiration, synthesis of foods, respiration, growth, movement, and reproduction.

100D. Microscopic Technique. (2) I.

Miss Esau

Laboratory, W, 1-4; 3 hours to be arranged.

Prerequisite: consent of instructor. Fee, \$3.50.

Practical introduction to methods of preparing plant tissues and materials for microscopic study, with discussion and assigned reading.

105. Plant Anatomy. (4) I.

Miss Esau

Lectures, Tu Th, 10; laboratory, Tu Th, 1-4. Fee, \$6.

Prerequisite: Botany 1A-1B.

The gross microscopical structure of plants; cell morphology, cell division, tissues and tissue systems.

106. Morphology of Flowering Plants. (3) II.

Miss Esau

Lecture, Tu, 10; laboratory, Tu Th, 1-4. Fee, \$3.50.

Prerequisite: Botany 1A-1B.

Development and structure of flowers, fruits, seeds and organs of vegetative reproduction of angiosperms.

107. Weed Control. (4) II.

Mr. Crafts, Mr. Harvey, Mr. Robbins

Lectures, Tu Th 11; laboratory, W, 1-4, S, 9-12.

110B. Systematic Botany of Seed Plants. (3) II.

Miss Esau

Lecture, M, 11; laboratory, M F, 1-4. Fee, \$6.

Prerequisite: Botany 1A-1B.

Laboratory and field studies of the characters and relationships of the principal families and genera of seed plants. Principles of taxonomy. Practice in identification of species by means of keys.

120A-120B. Plant Physiology. (2-2) Yr. Tu Th, 9.

Mr. Crafts

Botany 121A-121B must be taken concurrently.

The cell as a physicochemical system, buffer systems, absorption and accumulation of solutes, and water relations. Photosynthesis, metabolism and storage, enzyme action, respiration, and growth.

121A-121B. Plant Physiology Laboratory. (2-2) Yr. Tu Th, 1-4. Mr. Crafts

Prerequisite: Chemistry 8. Fee, \$11.50 a semester.

To be taken concurrently with 120A-120B.

130. Plant Cytology. (4) I.

Mr. Weier

Lectures, W S, 8; laboratory, W, 1-4, S, 9-12. Fee, \$6.

The structure and function of the cytoplasm and cytoplasmic bodies; detailed studies of the nucleus, including mitosis, meiosis, and apomixis; chromosome structure and rearrangement; polyploidy, including hybrids between polyploids; cytotaxonomy.

GRADUATE COURSE

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

The Staff (Mr. Robbins in charge)

CHEMISTRY

1A. General Chemistry. (5) I and II.Mr. Andrews, Mr. Keefer, Mr. Reiber, Mr. Volman,
Mr. Young, _____

I. Lectures (Young), Tu Th, 9; laboratory and quiz, Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4; Sec. 3, W, 1-4, S, 9-12.

II. Lectures (Andrews), Tu Th, 10; laboratory and quiz, Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4.

Prerequisite: any two of the three subjects, high school chemistry, physics, trigonometry, or high school chemistry or physics alone with a grade of A or B. Fee, \$16.

Combination group students may be admitted occasionally to Chemistry 1A by permission of the instructor.

1B. General Chemistry. (5) I and II.Mr. Andrews, Mr. Keefer, Mr. Reiber, Mr. Volman,
Mr. Young, _____

I. Lectures (_____), Tu Th, 10; laboratory and quiz, Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4.

II. Lectures (Keefer), Tu Th, 9; laboratory and quiz, Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4; Sec. 3, W, 1-4, S, 9-12.

Prerequisite: Chemistry 1A. Fee, \$16.

5. Quantitative Analysis. (3) II.

Mr. Volman

Lecture, Tu, 1; laboratory, Tu, 2-5, Th, 1-4. Fee, \$23.

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

A short course dealing with the principles and methods of quantitative analysis with some application to the analysis of agricultural materials.

8. Organic Chemistry. (3) I. M W F, 9.

Mr. Reiber

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

An introductory study of the compounds of carbon.

9. Organic Chemistry. (3) I.

Mr. Andrews and Assistants

Lecture, M, 1; laboratory, M, 2-5; F, 1-4. Fee, \$31.

Prerequisite: Chemistry 1B, with a grade of C or higher. Chemistry 8 should be taken concurrently.

An experimental study of the physical properties and chemical reactions of the common classes of organic substances.

109. Physical Chemistry Brief Course. (3) II. M W F, 9

Mr. Young

Prerequisite: Chemistry 5; one year of college physics.

Graduate students of high standing may, under exceptional circumstances, be admitted without the prerequisite courses in chemistry.

Selected topics in Physical Chemistry.

112. **Physical Chemistry.** (3) I. Mr. Keefer
 One hour lecture and six hours laboratory to be arranged.
 Prerequisite: Differential and Integral Calculus and Chemistry 110.
 Fee, \$25.
 Physiochemical measurements and problems for students in agriculture who require this training for graduate work. To be given in alternate years.
- *113. **Chemistry of Colloids.** (3) I. M W F, 11. Mr. Volman
 Prerequisite: consent of instructor.
 Properties of colloidal system of importance in agricultural biology. Chemistry and physics of surfaces, including adsorption, ion interchange and surface tension. The properties of sols, gels, and emulsions. To be given in alternate years.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
 The Staff (Mr. Young in charge)
 Prerequisite: consent of the instructor based upon adequate preparation in chemistry, mathematics and physics.
 Investigation of special problems to be selected according to the preparation and needs of the individual. Fee, \$15 (if laboratory work is included).
280. **Research.** (1-9) I and II. The Staff (Mr. Young in charge)
 The laboratory is open to qualified graduate students who wish to pursue original investigation. Students desiring to enroll in this course should communicate with the Chairman of the Division well in advance of the opening of the semester in which the work is to be undertaken. Such work will be under the direction of some member of the instructing staff, who will determine the credit value.

DAIRY INDUSTRY

Dairy Industry 1 is prerequisite to Dairy Industry 49 and to all upper division courses in dairy industry, except Dairy Industry 106 and 142.

1. **Principles of Dairying.** (3) I. Mr. Jack, Mr. Ralston
 Lectures, Tu Th, 8; laboratory, W, 1-4. Fee, \$3.50.
 Principles of dairying; breeds of dairy cattle; elements of milk production; composition and value of milk dairy products; laboratory tests of milk and milk products; principles of the manufacture of dairy products.
4. **Dairy Products Judging.** (1) I. Mr. Phillips
 S, 9-11; one hour to be arranged. Fee, \$2.50.
 Factors determining quality and value of milk, cream, butter, cheese, ice cream, and other dairy products.
49. **Summer Practice and Observation Course.** (6)
 The Staff (Mr. Phillips in charge)
 Daily, except Sunday, 8-5, six weeks. Required of all students whose major is dairy industry.
 Dairy manufacturing, market milk, dairy production, dairy plant management, and a survey of dairy plants and laboratories.

* Not to be given, 1946-1947.

- 101A-101B. **Dairy Products.** (5-5) Yr. Mr. Roadhouse, Mr. Jack
I (Roadhouse); II (Jack).
Lectures, Tu Th, 11, and one hour to be arranged; laboratory, Tu Th,
1-4. Fee, \$2.50 a semester.
Market milk, butter, cheese, and ice-cream industries; processing and
standardization of dairy products, dairy inspection, and laboratory con-
trol of products.
106. **Chemistry of Milk and Dairy Products.** (4) II. _____
Mr. Richardson, Mr. Tarassuk
Lectures, W, 9, S, 8; laboratory, W, 1-4, S, 9-12. Fee, \$3.
Prerequisites: Chemistry 1A-1B, 8.
The physical, physicochemical, and chemical properties of milk and
milk products, and their relation to the manufacture and quality of dairy
products.
107. **Laboratory Control and Dairy Technology.** (3) I. Mr. Richardson
Lecture, W, 9; laboratory, Tu Th, 9-12. Fee, \$2.50.
Evaluation of detergents and chemical sterilizers; water conditioning;
detection of adulteration; principles of manufacture and tests for quality
of milk powder, casein and by-products.
142. **Dairy Bacteriology.** (3) I. _____
Lecture, M, 10; laboratory, M W, 1-4. Fee, \$6.
Prerequisites: Chemistry 1A-1B, Bacteriology 1.
The bacteria found in milk and other dairy products; their ways of
entry; methods used in determining their number; effect of pasteurization
and other processes on bacteria.
160. **Proseminar.** (1) I and II. M, 9. The Staff (_____ in charge)
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
The Staff (_____ in charge)
- GRADUATE COURSES
- 200A-200B. **Research in Dairy Technology, Dairy Chemistry, and Dairy
Bacteriology.** (1-6; 1-6) Yr. _____, Mr. Jack, Mr. Mudge, Mr. Richardson,
Mr. Roadhouse, Mr. Tarassuk
- 201A-201B. **Seminar in Dairy Technology, Dairy Chemistry, and Dairy
Bacteriology.** (1-1) Yr. The Staff (_____ in charge)
Required of all students enrolled in course 200A-200B.

ECONOMICS

- 1A-1B. **Principles of Economics.** (3-3) Yr. _____
Lectures, Tu Th, 9; one hour to be arranged.
Introduction to economic theory and an analysis of the operation and
problems of the modern economic system.

EDUCATION

110. **Introduction to Educational Psychology.** (3) II. M W F, 10. _____
Original nature and tendencies of man; the learning process; individual
differences and their measurement; the growth and development of children.
Directed observation of normal children.

†160. **Vocational Education.** (2) I and II. Hours to be arranged.

Mr. Sutherland

Philosophy and organization of vocational education of less than college grade, with particular reference to educational principles for agriculture, commerce, homemaking, and industry.

†161. **Problems in Vocational Education.** (2) I and II. Hours to be arranged.

Prerequisite: course 160 or 162 (Berkeley).

Mr. Sutherland

Vocational surveys, junior employments, occupational analysis, trade tests, apprentice training, vocational education for adults, foremanship courses, corporation schools, current legislation, etc.

†162. **Continuation Education.** (2) I and II.

Mr. Sutherland

Hours to be arranged.

Place in the school system; various groups of pupils to be served; objectives, and types of administration and organization suited to various community needs, and other factors.

170. **Secondary Education.** (2) II. Tu Th, 10.

Function, scope, objectives and curricula, including the fields of the high school and junior college in relation to individual and social needs.

198. **Directed Group Study of Agricultural Education.** (2) II. Tu Th, 9.

Mr. Sutherland in charge

Group study of selected problems dealing with subject matter relating to the teaching of technical agriculture.

199. **Special Study for Advanced Undergraduates in Agricultural Education** (1-5) I and II.

Mr. Sutherland

GRADUATE COURSE

260A-260B. **Vocational Education Seminar.** (2-2) Yr.

Mr. Griffin, Mr. Sutherland

For graduate students whose major interest is in vocational education, vocational guidance, or closely related problems.

SUPERVISED TEACHING

†320. **Supervised Teaching, Including Professional Methods.** (6) I and II.

Sec. 1. Agriculture. Hours to be arranged. Mr. Sutherland, _____

The principles and methods of teaching agriculture in the secondary schools of California in accordance with the provisions of the Federal and State Vocational Education acts.

†323. **Practicum in Supervised Teaching.** (2) I and II.

Sec. 2. Hours to be arranged.

Mr. Sutherland, _____

Prerequisite: course 320 or experience as a teacher, and the consent of the instructor.

An opportunity to obtain more extended and varied experience under supervision. The candidate teaches ten weeks and attends one professional methods section offered under course 320, as well as such demonstration and discussion groups as may be assigned. One hundred hours of work, including preparation, is the normal requirement. Hours are divided among various types of work according to the candidate's previous experience.

† Open only to apprentice teachers and graduate students.

ENGLISH

Subject A is prerequisite to all degree courses in English.

- 1A. **Composition.** (3) I and II. Mr. Fishman, Mrs. Wright, ———, ———
M W F, Sec. 1, 10; Sec. 2, 11.
- 1B. **Introduction to Literature.** (3) I and II.
Mr. Fishman, Mrs. Wright, ———, ———
I. M W F, 9; II. M W F, 8.
1A is not prerequisite to 1B.
9. **Directed Reading.** (1-3) I and II. Mr. Fishman, Mrs. Wright
Prerequisite: English 1A and consent of the instructor.
Conferences, reports, and examinations.
This course may be repeated for credit.
- 46A-46B. **Survey of English Literature.** (3-3) Yr. Mr. Fishman
I. M W F, 9; II. M W F, 11.
Prerequisite: sophomore standing; 46A is not prerequisite to 46B.

ENTOMOLOGY AND PARASITOLOGY

105. **Apiculture.** (4) II. Mr. Eckert
Lectures, Tu Th, 1; laboratory, Tu Th, 2-5.
Biology and handling of bees.
116. **Veterinary Parasitology.** (3) I. Mr. Douglas
Lectures, Tu Th, 9; laboratory, W, 1-4.
Prerequisite: Zoölogy 1A-1B.
(This course or Veterinary Science 111 meets the requirements of 3
units of parasitology in the animal science curriculum.)
Parasites of domesticated animals.
124. **Economic Entomology.** (4) I. Mr. Bailey, Mr. Smith
Lectures, Tu Th, 11; laboratory, Sec. 1, Tu Th, 8-11; Sec. 2, Tu Th, 1-4.
Life histories, habits, and control of insects attacking fruit trees and
field and truck crops of California.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Bailey, Mr. Eckert, Mr. Bohart, Mr. Douglas,
Mr. Lange, Mr. Smith, Mr. Stafford
Laboratory and field investigation of a minor problem in the field of
entomology or parasitology.

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. M Tu W Th F, 10. Mr. Nelson
This course corresponds to the first two years of high school French.
2. **Elementary French.** (4) I. M Tu W Th F, 11. Mr. Nelson
Prerequisite: course 1 or two years of high school French.

GENETICS

100. **Principles of Genetics.** (4) I. Mr. Gregory
Lectures, M W F, 8; laboratory, Sec. 1, F, 1-4; Sec. 2, S, 9-12.
Prerequisite: Botany 1A, Zoölogy 1A or Zoölogy 10 and either Botany 1b
or Zoölogy 1B; or Botany 12, 16, and Zoölogy 1A. Fee, \$2.50.
Introduction to genetics with some consideration of its applications in
agriculture and biology.

GRADUATE COURSE

- 200A-200B. **Research in Genetics.** (1-6; 1-6) Yr.
Mr. Asmundson, Mr. Briggs, Mr. Gregory, Mr. Love,
Mr. Clausen, Mr. Olmo, Mr. Rick

GEOLOGY

- 1A. **General Geology.** (3) II. Mr. Gilbert
Lectures, M W, 10. An additional hour to be arranged.
Prerequisite: one year of elementary chemistry.
Minerals and rocks; weathering and erosion of rocks; study of sub-
surface water, volcanoes, earthquakes and mountain-building movements.

GERMAN

1. **Elementary German.** (4) I. M Tu W F, 10. Mr. Fishman
This course corresponds to the first two years of high school German.
2. **Elementary German.** (4) II. M Tu W F, 10. Mr. Fishman
Prerequisite: course 1 or two years of high school German.

HISTORY

- 4A-4B. **History of Western Europe.** (3-3) Yr. Tu Th, 8. Mr. Puryear
One recitation section weekly to be arranged in each semester.
The growth of western European civilization from ancient times to the
present.
4A is not prerequisite to 4B.
- 8A-8B. **History of the Americas.** (3-3) Yr. M W F, 8. Mr. Shideler
8A is not prerequisite to 8B.
An introductory course in the history of the Western Hemisphere from the
discovery to the present.
- 17A-17B. **History and Institutions of the United States.** (3-3) Yr.
Tu Th, 10. One weekly section hour to be arranged. Mr. Puryear
Open to all students above the freshman year.
Designed for the general student and to provide a basis for advanced
study.
17A is not prerequisite to 17B.
- 171A-171B. **History and Institutions of the United States.** (3-3) Yr.
Tu Th, 10. One weekly section hour to be arranged. Mr. Puryear
NOTE.—This course has been reclassified as 17A-17B (see above). Upper
division students may obtain upper division and major credit for it by
entering it on their study lists as 171A-171B.

- *185. **Government and Agriculture of the United States.** (3) II. M W F, 10.
Mr. Shideler

Major problems of the relations between government and agriculture, including their special significance for California; public land policies; transportation; agricultural education; the agrarian reform movements; tariffs; marketing; credit; surpluses; conservation.

- *188A-188B. **History of Agriculture in the Americas.** (2-2) Yr.
Lectures, Tu Th, 8. Mr. Puryear

188A is not prerequisite to 188B.

A general survey of the history of agriculture in North and South America from pre-Columbian times to the present.

- *189A-189B. **History of the Southwest and the Pacific Coast.** (2-2) Yr.
Tu Th, 8. Mr. Puryear

189A is not prerequisite to 189B.

Emphasis will be placed on the history of California and its relation to the Pacific area.

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

HOME ECONOMICS

- 1A-1B. **Experimental Food Study.** (3-3) Yr. _____

Lecture, one hour to be arranged; laboratory, Tu Th, 1-4.

Prerequisite or taken concurrently: Chemistry 1A, and 8. Recommended: Bacteriology 1. Fee, \$8 per semester.

Production and composition of food and principles involved in food preservation and meal preparation.

5. **Elementary Clothing Study.** (3) I. _____

Lecture, Tu, 11; laboratory, M W, 1-4. Fee, \$2.

Prerequisite: Decorative Art 16A-16B.

Cultural, practical, and technical problems in clothing. Color, design, and the analysis of typical forms in pattern shapes.

7. **Introduction to Textiles.** (3) II. _____

Lectures, M W, 11; laboratory, W, 1-4. Fee, \$2.50.

Recommended: Chemistry 8.

Study of plant, animal and synthetic fibers used in textiles and of the finished textile materials.

- *10. **Nutrition.** (2) I and II. _____

A nontechnical presentation of the scientific and practical bases and uses of the modern knowledge of nutrition.

14. **Consumer Problems.** (2) II. _____

Lectures, Tu Th, 4.

A nontechnical discussion of consumers' problems.

Not accepted as part of the major in Home Economics.

* Not to be given, 1946-1947.

FOOD ECONOMICS AND TECHNOLOGY

100. **Food Economics.** (3) II. _____
 Lecture, Tu Th, 10; field or laboratory work, F, 1-4. Estimated cost of field trips, \$1.
 Prerequisite or concurrent: Home Economics 141.
 Field observation of manufacturing and distribution to observe practices related to problems of consumers including those buying foods in large quantities.

NUTRITION

- 102A-102B. **Food Dietetics.** (3-3) Yr. _____
 Lectures, Tu Th, 9; laboratory, M, 1-4. Fee, \$5 per semester.
 Prerequisite: Chemistry 1A and 8, Physiology 1A, and Home Economics 1A-1B.
 The food requirements of the normal individual and the special needs imposed by growth, pregnancy, lactation, and disease. The planning and computation of diets.

CHILD DEVELOPMENT

132. **Child Development.** (3) I. M W F, 9. _____
 Prerequisite: Psychology 1A and preparation in statistics. Not open to students who have taken Psychology 112.
 A study of the factors concerned in the motor, sensory, language, emotional, and social development of young children and directed observation of children in the nursery school.
133. **Laboratory in Child Development.** (1) I. _____
 Time to be arranged—requires 6 hours a week for eight weeks.
 Prerequisite: course 132.
 Laboratory supplement to course 132 conducted at the nursery school.
134. **Child Care and Family Health.** (3) II. M W F, 9. _____
 Prerequisite: Physiology 1A.
 A consideration of the physical development of children from prenatal through adolescent life and the factors affecting health during this period.

FAMILY ECONOMICS

140. **Home Management.** (3) II. Miss Warren
 Lectures, Tu T, 8; laboratory, F, 1-4.
 Prerequisite: Physiology 1A and Psychology 1A.
 Use of time, energy, and equipment in the home from the viewpoint of the satisfaction of members of the family.
- 140L. **Home Management Laboratory.** (2) II. Miss Warren
 To be taken concurrently with 140. Should be taken in the senior year.
 Laboratory which includes living for a period of 5 weeks under supervision in the practice cottage. A fee is required to cover food, lodging, and laundry.
141. **Consumers and the Market.** (3) I. M W F, 10. Miss Warren
 Prerequisite or concurrent: Economics 1A-1B. Not open to students who are taking or have taken Agricultural Economics 101A or Economics 123.
 A study of the functions and structure of the market from the standpoint of consumers: evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.

142. **Social Problems of Families.** (3) I. Tu Th S, 8. Miss Warren
Prerequisite: Economics 1A-1B, and preparation in statistics.
Present-day problems of families as they are related to economic and social conditions.
- *144. **Family Finance.** (3) II. Miss Warren
Prerequisite: Economics 1A-1B, and preparation in statistics.
Money income, household production, credit, savings, investments, financing home ownership.
150. **The House.** (2) II. Tu Th, 11. Mrs. Irwin
Hours to be arranged.
Dwellings—isolated and collective; their historic and aesthetic development; their elements and arrangements; their equipment. (Similar to Architecture 110 given at Berkeley.)

TEXTILES AND CLOTHING

162. **Clothing Economics.** (3) I. ———
Lectures, Tu Th, 10; laboratory, F, 1-4.
Prerequisite or concurrent: Home Economics 7, and 141.
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.
167. **Clothing Design and Construction.** (3) II. ———
Lecture, F, 11; laboratory, Tu Th, 1-4.
Prerequisite: Home Economics 5 and 7. Fee, \$2.50.
Theory and practice of costume design and construction.

DECORATIVE ART

- 16A-16B. **Theory of Design and Color.** (2-2) Yr. Mrs. Irwin
Laboratory, Sec. 1, M W, 1-4; Sec. 2, Tu Th, 1-4.
Principles of design; analysis of historic examples; original problems in the general field of design.
- 130A. **Interior Design.** (2) I. Tu Th, 11. Mrs. Irwin
Space relations and proportions; design, selection, and arrangement of furnishings.
- *190. **House Furnishing.** (2) II. Mrs. Irwin
Prerequisite: courses 16 and 130A.
Arrangement of the house and furnishings in terms of color and design.

HORTICULTURE

2. **Fruit Growing.** (3) I. M W F, 8. Mr. L. D. Davis
Prerequisite: Botany 1A or 12.
Fruit growing practices; propagating, planting, and culture of orchard and small fruits.
- *10. **Plant Propagation.** (2) II. Mr. R. E. Baker
Principles of plant propagation, with special reference to horticultural plants.

* Not to be given, 1946-1947.

- 105P. **Pomology: Fruit and Fruit Handling.** (3). Mr. R. M. Brooks
Th F, 8, W F, 1; Th F, 9-12; W F, 2-5.
Prerequisite: Horticulture 2.
A six weeks' summer course beginning August 5, 1946. May be taken concurrently with 105v.
Fruit handling practices and problems emphasizing the characteristic differences of certain species and varieties of fruit.
- 106A-106B. **Fruit Plants.** (2-2) Yr. Mr. Proebsting, Mr. R. E. Baker
Lecture, M, 10; laboratory, M, 1-4.
Prerequisite: Horticulture 2.
Fruit growing practices, emphasizing the characteristic differences of certain species of fruit plants.
Course 106A is not prerequisite to 106B.

VITICULTURE AND ENOLOGY

- 105v. **Viticulture: Fruit Handling and Varieties.** (3). Mr. Winkler
M Tu W, 8, Tu, 1; M Tu W, 9-12, Tu, 2-5.
Prerequisite: Horticulture 116.
A six weeks' summer course beginning August 5, 1946. May be taken concurrently with 105P.
Maturity and standardization; varieties; harvesting table grapes; raisin drying; storage; costs and returns.
116. **General Viticulture.** (4) II. Mr. Winkler
Lectures, M W F, 8; laboratory, F, 1-4. Fee, \$2.50.
Prerequisite: Horticulture 2.
The structure, physiology, and climatic requirements of the vine; principles underlying propagation, pruning, grafting, cultivation; and factors influencing fruit development and quality.
- 120A-120B. **Enology.** (3-3) Yr. Mr. Amerine, Mr. Castor, Mr. Guymon
I. Lecture, W, 10; laboratory, Th, 1-4 and three hours to be arranged.
II. Lectures, Tu Th, 9; laboratory, W, 1-4.
Prerequisite: Viticulture 105v, Bacteriology 1. Chemistry 5 and 8 recommended. Course 120A is not prerequisite to 120B. Fee, \$5 a semester.
A. The principles and practices of making the various types of wine with special reference to the varieties used and the methods of vinification required by each.
B. Chemical and biological control measures for wines; wine types as related to environment and variety; production of special wines and brandy.

GENERAL HORTICULTURE

110. **Fruit Morphology.** (3) I. Mr. R. M. Brooks
Lecture, W, 10; laboratory, W F, 1-4. Fee, \$2.50.
Prerequisite: Botany 1A-1B.
The morphological development of the flower, fruit, and seed of more than thirty typical horticultural species.
112. **Handling and Storage of Deciduous Fruits and Grapes.** (2) I. Mr. Allen
Lectures, Tu Th, 9.
Prerequisite: Horticulture 2, Botany 7 or equivalent.
Fundamentals of certain fruit-handling operations; fruit maturity; precooling; fruit storage and transportation. Particular emphasis is given to the physiological principles underlying these post-harvest practices.

114. **Fruit Breeding.** (3) II. Mr. Olmo
 Lectures, Tu Th, 8; laboratory, Tu, 1-4.
 Prerequisite: Horticulture 2, Genetics 100. Fee, \$2.50.
 The genetics and cytology of fruit species in relation to varietal improvement, including a study of sterility, incompatibility, interspecific hybridization and clonal selection in fruit varieties.
121. **Advanced Horticulture.** (3) I. Mr. Proebsting
 Lectures, Tu Th, 8, and one hour to be arranged.
 Prerequisite: Horticulture 2; either 105P and 106A-106B, or 116 and 105V; Botany 7.
 The physiology of fruit trees, their response to environment and to cultural operations.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
 Mr. Tufts, Mr. Allen, Mr. Amerine, Mr. R. E. Baker, Mr. R. M. Brooks, Mr. Castor, Mr. Claypool, Mr. Davey, Mr. L. D. Davis, Mr. Guymon, Mr. Hendrickson, Mr. Jacob, Mr. King, Mr. Lilleland, Mr. Olmo, Mr. Proebsting, Mr. Williams, Mr. Winkler

GRADUATE COURSES

- 201A-201B. **Research in Pomology.** (1-6; 1-6) Yr.
 Mr. Tufts, Mr. Allen, Mr. R. E. Baker, Mr. R. M. Brooks, Mr. Claypool, Mr. Davey, Mr. L. D. Davis, Mr. Hendrickson, Mr. King, Mr. Lilleland, Mr. Proebsting
- 205A-205B. **Seminar.** (1-1) Yr. Mr. L. D. Davis
- 233A-233B. **Research in Viticulture and Enology.** (1-6; 1-6) Yr.
 Mr. Winkler, Mr. Amerine, Mr. Castor, Mr. Guymon, Mr. Jacob, Mr. Olmo, Mr. Williams

IRRIGATION

100. **Principles Underlying Irrigation in Its Soil and Plant Relationships.** (3) II. Mr. Veihmeyer
 Lectures, Tu Th, 10; laboratory, W, 1-4.
 Prerequisite: Botany 7, Physics 2A-2B, Chemistry 1A-1B.
 A general course covering movement of irrigation water in the soil, the relation of soil moisture to plant growth, and the availability of soil moisture to plants.
110. **Development and Use of Farm Irrigation Water Supplies and Systems.** (4) I. Mr. Veihmeyer, Mr. Doneen
 Lectures, M W F, 9; laboratory, F, 1-4.
 Prerequisite: Physics 2A-2B.
 Irrigation as a factor in agriculture; principles of irrigation practice; development of the farm irrigation water supply; preparation of land for irrigation; design of farm irrigation systems; water requirements of crops.
120. **Irrigation Hydraulics.** (3) II. Mr. Johnston
 Lectures, Tu Th, 11; laboratory, W, 1-4.
 Prerequisite: Engineering 1A and 110. (Irrigation 103 at Berkeley may be substituted for 110.)
 The principles of hydraulics as applied to design of water-measuring devices, ditches, flumes, pipe lines, drops, diversion structures, reservoirs, pumping machinery, sprinkling systems, and other irrigation equipment. The instruction is arranged to suit the training and needs of the individual student.

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

M W F, 8.

Mr. Johnston

Prerequisite: Chemistry 1A-1B, Physics 2A-2B.

Origin and disposition of ground water, methods of estimating the sufficiency of ground water supplies; hydraulics of wells; construction of wells; installation and operation of irrigation pumping systems.

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

The Staff (Mr. Veihmeyer in charge)

GRADUATE COURSE

201A-201B. Research in Irrigation. (1-6; 1-6) Yr.

The Staff (Mr. Veihmeyer in charge)

ENGINEERING

1A. Plane Surveying. (3) I.

Mr. Brown

Lectures, Tu Th, 9; laboratory, Th, 1-4.

Prerequisite: plane trigonometry.

Principles; field practice; calculations and mapping with special reference to irrigation, drainage, and agricultural engineering problems.

LANDSCAPE DESIGN

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

Mr. Stahl

Lecture, W, 10; laboratory, W, 1-4.

Not open to major students in landscape design.

A general study of the principles and methods governing the design of small properties, and the use of plant materials.

MATHEMATICS

C. Trigonometry. (3) I and II. M W F, 10, 11.

Mr. G. A. Baker, Mr. Patten, ———

Prerequisite: plane geometry; one and one-half years of high school algebra or course D.

Course C includes plane trigonometry and spherical right triangles.

D. Intermediate Algebra. (3) I and II.

Mr. G. A. Baker, Mr. Burdette

Tu Th S, 8; M Tu W Th F, 9, 11.

Prerequisite: one year of high school algebra. One and one-half years of high school algebra is advised. Students who need extra drill will be asked to attend a section meeting five days a week. Not open to students who have received credit for two years of high school algebra, or course 3A, or 8 given at Berkeley. (This course was formerly numbered 1.)

Exponents, progressions, the binomial theorem, logarithms, inequalities, mathematical induction, determinants, applications.

1. College Algebra. (3) I. M W F, 9.

Review and practice in general ideas and applications of algebra and trigonometry. Methods of proof and scientific procedure as exemplified in these subjects.

Open only to students who transfer to the course from 3A.

3A. Plane Analytic Geometry. (3) I. M W F, 9. Mr. Roessler
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.

Includes conic sections, general equations of the second degree.

NOTE: A qualifying test in elementary algebra will be given at the end of two weeks of the course. Students who fail this test will be required to pass course 1 before taking 3A.

3B. First Course in Calculus. (3) II. M W F, 9. Mr. Roessler

Prerequisite: course 3A.

Differential calculus with applications to geometry and mechanics.

4A. Second Course in Calculus. (3) I. M W F, 8. Mr. Burdette

Prerequisite: course 3B.

Continues the development and application of the calculus; includes integration, infinite series.

4B. Third Course in Calculus. (3) II. M W F, 8. Mr. Burdette

Prerequisite: course 4A.

Continuation of calculus, including quadratic surfaces, partial derivatives, and multiple integrals, with applications to geometry and mechanics.

***10. Spherical Trigonometry and Applications.** (2) I. Tu Th, 10. ———

Prerequisite: plane trigonometry; one and one-half years high school algebra, or Course D and plane trigonometry.

11A-11B. Analytic Geometry and Calculus. (3-3) Yr. M W F, 11.

Mr. Burdette

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.

105A-105B. Statistical Methods for Biologists. (2-2) Yr. Tu Th, 8.

Mr. Roessler, Mr. G. A. Baker

Prerequisite: consent of the instructor.

Recent developments in statistical analysis, methods of sampling, design of experiments, and interpretation of results.

110A-110B. Advanced Calculus. (2-2) Yr. Tu Th, 9. Mr. Burdette

Prerequisite: course 4B.

Conjugate functions, hyperbolic functions, Fourier series, differential equations.

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

The Staff (Mr. Roessler in charge)

MILITARY SCIENCE AND TACTICS

Military 5 (first course). (2) I.

Mr. Butts

Drill: two hours per week, Tu Th, 11.

Theory: two hours per week to be selected by the student from the schedule of classes issued by the department.

Military discipline, customs and courtesies, articles of war, field sanitation, rifle marksmanship, extended order formations, close order drill, command and leadership.

* Not to be given, 1946-1947.

- Military 6 (second course). (2) II.** Mr. Butts
 Drill: two hours per week, Tu Th, 11.
 Theory: two hours per week to be selected by the student from the schedule of classes issued by the department.
 Map and aerial photograph reading, equipment and clothing, first aid, personal and sex hygiene, close order drill, command and leadership.
- Military 7 (third course). (2) I.** Mr. Butts
 Drill: two hours per week, Tu Th, 11.
 Theory: two hours per week to be selected by the student from the schedule of classes issued by the department.
 Organization of the Army, concealment and camouflage, field fortifications, cover and movement, functions of scouts, observers and messengers, patrol operations, marches and bivouacs, interior guard duty, close order drill, command and leadership.
- Military 8 (fourth course). (2) II.** Mr. Butts
 Drill: two hours per week, Tu Th, 11.
 Theory: two hours per week to be selected by the student from the schedule of classes issued by the department.
 Safeguarding military information, basic weapons, tent pitching, motor transportation and maintenance, protection against carelessness, close order drill, command and leadership.
- Military 9. Military Leadership. (½) I and II.** Mr. Butts
 One hour per week to be arranged with the department.
 Group study of the techniques and problems of military leadership methods of instruction and training and the duties of commissioned and noncommissioned officer rank.
 The course may be repeated in successive semesters with full credit.
- Military 100A-100B. Advanced Infantry Training. (3-3) Yr.** Mr. Butts
 Drill: two hours per week, Tu Th, 11.
 Theory: three hours per week to be selected by the student from the schedule of classes issued by the department.
 Open to all students who have completed Military 8 and to veterans of one or more years' service.
 Duties of noncommissioned and commissioned officers, military history, infantry weapons, scouting and patrolling, combat principles, and administrative duties as pertaining to commissioned officers.

PHYSICAL EDUCATION

Men

- 1. Physical Training, Recreation, and Competitive Sports. (½-½) Yr.**
 Mr. Toomey, Mr. E. S. Wilson, Mr. Schall, Mr. Hickey, Mr. Stromgren
 Sections meet twice weekly at hours to be arranged.
 Students may enroll for physical education as an elective course. Sections are organized in baseball, basketball, boxing, football, golf, riding, soccer, tennis, touch-football, track, wrestling, swimming and water sports. Men qualified for athletics may enroll in any sport pursued at Davis, such as football, basketball, etc., and receive credit for this elective.

33. **First Aid.** ($\frac{1}{2}$) I and II. The Staff
2 hours weekly.
The standard and advanced courses are combined. Upon successful completion, the Red Cross Certificate is awarded. Fee, \$1 including textbooks; fifty cents without textbook.

Women

26. **Physical Education.** ($\frac{1}{2}$) I and II. _____
Two 1-hour periods a week by arrangement.
Sections in archery, badminton, volleyball, riding, swimming, life-saving, swimming formations.

33. **First Aid.** ($\frac{1}{2}$) I and II. The Staff
2 hours weekly.
The standard and advanced courses are combined. Upon successful completion, the Red Cross Certificate is awarded. Fee, \$1, including textbook; fifty cents without textbook.

PHYSICS

- 2A-2B. **General Physics.** (3-3) Yr. Mr. Gardner, _____
Beginning each semester. Three lectures and one discussion section weekly.
2A. I. (Gardner), M W F, 11; II. (_____), M W F, 8.
2B. I. (_____), M W F, 8; II. (Gardner), M W F, 11.
Properties of matter, mechanics, heat, sound, light, electricity, and magnetism.

- 3A-3B. **General Physics Laboratory.** (1-1) Yr. Mr. Gardner
Beginning each semester.
3A. I. Th, 1-4; II. F, 1-4.
3B. I. F, 1-4; II. Th, 1-4.
Recommended for students who elect course 2A-2B. Fee, \$4.50 a semester.
Mechanics, properties of matter, heat, sound, light, electricity, magnetism. Experimental work planned to accompany the lectures in course 2A-2B.

- 4A. **General Physics.** (4) II. Mr. Patten
Lectures, Tu Th, 10; laboratory, W, 1-4. Fee, \$4.50 a semester.
Prerequisite: (1) high school physics or chemistry; (2) Mathematics 3A-3B. (May be taken concurrently.) Not open to students majoring in agriculture except by permission of instructor.
Mechanics, properties of matter.

- *106. **Atomic Structure and Structure of Matter.** (3) II. W M F, 8. Mr. Gardner
Prerequisite: one year of college physics, and Chemistry 1A-1B.
An introduction to the fundamentals of atomic structure and the structure of matter with particular emphasis on processes of biological importance. (Given in alternate years.)

116. **Heat.** (2) I. Tu Th, 8. Mr. Patten
Prerequisite: one year of college physics, and Chemistry 1A-1B.
Deals with the fundamental phenomena of heat with particular emphasis on measurement and theory of heat transfer. (Given in alternate years.)

199. **Special Study for Advanced Undergraduates.** (1-5) I and II. The Staff
All special work of upper division grade not included in courses announced above.

* Not to be given, 1946-1947.

PHYSIOLOGY

- 1A. **Introductory Physiology.** (3) I. M W F, 10. ———
 Prerequisite: high school chemistry and sophomore standing.
 The physiology of muscle, nerve, central nervous system, sensation, circulation, respiration, excretion, and digestion.
- 1C. **Introductory Physiology, Laboratory.** (2) I. ———
 Laboratory, M F, 1-4. Fee, \$11.50.
 Prerequisite: course 1A completed or in progress.

PLANT PATHOLOGY

120. **Plant Diseases.** (4) II. Mr. Leach, Mr. Houston
 Lectures, Tu Th, 9; laboratory, Sec. 1, Tu Th, 1-4; Sec. 2, W F, 1-4.
 Fee, \$2.50.
 Prerequisite: Botany 1A-1B and Bacteriology 1.
 A general course on the nature, cause, and control of plant diseases.
125. **Diseases of Truck and Field Crops.** (2) I.
 Laboratory, M W, 1-4. Mr. Kendrick, Mr. E. E. Wilson
 Prerequisite: Plant Pathology 120.
 The pathology of important crop plants. Dissemination, factors influencing inception and severity of disease, diagnosis, host reaction, control.
- NOTE.—This course is given in alternate years at Berkeley and at Davis. To be given at Berkeley, 1946-1947.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
 Mr. Hewitt, Mr. Houston, Mr. Kendrick, Mr. Leach, Mr. E. E. Wilson

GRADUATE COURSE

- 230A-230B. **Research in Plant Pathology.** (1-6; 1-6) Yr.
 Mr. Hewitt, Mr. Houston, Mr. Kendrick, Mr. Leach, Mr. E. E. Wilson

POLITICAL SCIENCE

9. **Elements of Government and Politics.** (3) I. M W F, 10. Mr. Shideler
 Approaches to the study of political science; constitutions, forms of government, types of government; foundations of the democratic and authoritarian states; current problems of government.
113. **American Political Theory.** (2) II. Tu Th, 9. Mr. Shideler
 Underlying theories and principles of United States government and policy.

POULTRY HUSBANDRY

1. **Poultry Production.** (3) II. Mr. Asmundson
 Lectures, Tu Th, 8; laboratory, Sec. 1, M, 1-4; Sec. 2, W, 1-4. Fee, \$3.50.
 An introductory study of the relation of the several sciences underlying poultry production to poultry husbandry practice.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
 The Staff (Mr. Asmundsen in charge)
 Prerequisite: Poultry Husbandry 1, courses basic to problem elected, and consent of instructor.
 Problems relating to the nutrition, breeding, incubation, physiology and egg quality of chickens or turkeys may be elected.

GRADUATE COURSE

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

Mr. Asmundsen, Mr. Kratzer, Mr. F. W. Lorenz

PSYCHOLOGY

1A. **General Psychology.** (3) II. M W F, 11. _____

An introduction to the facts and principles of psychology.

PUBLIC HEALTH

5A. **Elementary Public Health.** (3) II. M W F, 8. _____

A general survey of the field of public health in the United States, including a consideration of the causes of death, sickness, and disability; the conservation of infant and child life; the home and the industrial environment; the noncommunicable diseases; and the presentation of health instruction.

PUBLIC SPEAKING

Subject A is prerequisite to all degree courses in public speaking.

1A. **Elements of Public Speaking.** (3) I and II. Mr. Fishman, Mrs. Wright
I. M W F, 9; II. Sec. 1, M W F, 8; Sec. 2, M W F, 9.*1B. **Principles and Types of Speech.** (3) I and II. M W F, 9. _____

Prerequisite: Public Speaking 1A.

SOIL SCIENCE

106. **Elements of Soil Science.** (4) II. _____

Mr. L. E. Davis

Lectures, M W F, 9; laboratory, M, 1-4.

Prerequisite: Chemistry 1A.

The origin and properties of soil-forming rocks; the earth's surface features with special reference to soils and land use; development of soil as a natural body; soil profiles; physical, chemical, and biological properties of soil; soil structure; soil classification; soil mapping; a brief treatment of soil management.

110. **The Soil as a Medium for Plant Growth.** (4) I. _____

Mr. J. P. Conrad

Lectures, M W F, 11, W, 4.

Prerequisite: Chemistry 1A-1B, 8.

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.

Irrigation in Its Soil and Plant Relationships. (See Irrigation 100.)199. **Special Study for Advanced Undergraduates.** (1-5) I and II.

Mr. J. P. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

GRADUATE COURSE

200A-200B. **Research in Soil Science.** (1-6; 1-6) Yr.

Mr. J. P. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

SPANISH

1. **Elementary Spanish.** (4) I and II. M Tu W Th F, 9. _____

Mr. Nelson

This course corresponds to the first two years of high school Spanish.

2. **Elementary Spanish.** (4) II. M Tu W Th F, 11. _____

Mr. Nelson

Prerequisite: Course 1 or two years of high school Spanish.

* Not to be given, 1946-1947.

SUBJECT A

Subject A. **English Composition.** I and II (No credit) Mrs. Sikes
 Sec. 1, M W F, 10; Sec. 2, M W F, 11

Required of all students who do not pass the examination in Subject A. Fee, \$10. Students who maintain an average grade of A during the first seven weeks of the semester will receive a refund of \$5 and will be excused from further attendance in the course.

TRUCK CROPS

1. **Vegetable Production.** (3) I and II. M W F, 8.

I. Mr. MacGillivray, II. Mr. Hanna.

Principles involved in vegetable production; survey of the vegetable industry.

105. **Systematic Olericulture.** (3) I.

Mr. Rick

Lecture, Th, 1; laboratory, Th, 2-5, S, 9-12.

Prerequisite: Truck Crops 1, Botany 1A-1B. Fee, \$2.50.

Origin, history, types, classification, nomenclature, adaptation, and judging of the more important American vegetable varieties. Two field trips will be made on Saturdays at an approximate total cost of \$10.

121. **Vegetable Physiology.** (3) II.

Mr. O. A. Lorenz, Mr. Mann

Lectures, M W, 9; laboratory, Tu, 1-4.

Prerequisite: Truck Crops 1, Botany 7, or consent of the instructor.

Physiological principles involved in the production, transportation, and storage of vegetables.

122. **Advanced Truck Crops.** (3) I. M W F, 11. Mr. Knott, Mr. Morris

Prerequisite: Truck Crops 1, or consent of instructor.

Methods of production and handling of the principal California vegetable crops, including the application of pertinent experimental evidence.

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

Mr. Knott, Mr. MacGillivray, Mr. G. N. Davis, Mr. Doneen, Miss Esau, Mr. Hanna, Mr. O. A. Lorenz, Mr. Mann, Mr. Morris, 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. O. A. Lorenz, Mr. MacGillivray, Mr. Mann, Mr. Morris, Mr. Rick, Mr. P. G. Smith

VETERINARY SCIENCE

111. **Principles of Pathology and Control of Diseases of Domestic Animals.**

(3) II. M W F, 9.

Mr. H. S. Cameron

Prerequisite: Animal Husbandry 110 and Bacteriology 1.

The causes, pathology, prevention, and control of animal diseases in relation to economic production and public health.

NOTE.—This course or Entomology 116 meets the requirement of 3 units of parasitology in the animal science curriculum.

GRADUATE COURSE

200A-200B. **Research in Animal Pathology.** (1-6; 1-6) Yr.

Mr. H. S. Cameron, Mr. Hinshaw

VITICULTURE—(See Horticulture)

ZOOLOGY

- 1A. **General Zoölogy.** (5) I. Mr. Storer, Mr. Miller, Mr. Rosenberg
Lectures, M W F, 10; laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4;
Sec. 3, W, 1-4, S, 9-12. Fee, \$4.50.
Introduction to the structure, physiology, classification, and interrela-
tions of animals, and the principles of evolution and heredity.
- 1B. **Vertebrate Anatomy.** (3) II. Mr. Storer, Mr. Miller
Lecture, Tu, 10; laboratory: Sec. 1, M F, 1-4; Sec. 2, Tu Th, 1-4. Fee,
\$4.50.
Prerequisite: Zoölogy 1A.
Structure of the vertebrate body with special reference to the mammal
and bird; gross and microscopic anatomy of organs and organ systems.
- 1C. **Vertebrate Embryology.** (2) II. Mr. Storer, Mr. Rosenberg
Lecture, Th, 10; laboratory: Sec. 1, W, 1-4; Sec. 2, S, 9-12. Fee, \$2.
Prerequisite: Zoölogy 1A-1B. Zoölogy 1B may be taken concurrently.
Elements of vertebrate embryology with special reference to the bird
and mammal.
10. **General Biology.** (3) I. Mr. Rosenberg
M W F, 8; one weekly conference hour to be arranged.
An outline of the main facts and principles of animal biology with
special reference to evolution, heredity, and the bearing of biology upon
human life. Open without prerequisite to all students, but designed for
those not specializing in zoölogy. Not open for credit to students who have
had Zoölogy 1A, but students who have taken Zoölogy 10 may elect Zoölogy
1A for credit.
- 100D. **Microscopic Technique.** (2) II. Mr. Rosenberg
Laboratory, Tu Th, 1-4. Fee, \$3.50.
Prerequisite: Zoölogy 1A-1B and at least sophomore standing.
Practical introduction to methods of preparing animal tissues and
materials for microscopic study, with discussions and assigned reading.
116. **Economic Vertebrate Zoölogy.** (3) II. Mr. Storer
Lectures, Tu Th, 11; laboratory, W, 1-4. Fee, \$3.50.
Prerequisite: Zoölogy 1A.
Relation of vertebrate animals to human affairs; effect of settlement,
lumbering, agricultural operations and hunting on wild animal populations;
attention to rodents, deer, carnivorous mammals and birds, fur production,
game birds, food and game fishes; principles of and agencies concerned
with animal management and conservation.
Minimum enrollment of 5 students.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.
Mr. Storer, Mr. Miller, Mr. Rosenberg
- GRADUATE COURSE
- 200A-200B. **Research in Zoölogy.** (1-6; 1-6) Yr.
Mr. Storer, Mr. Miller, Mr. Rosenberg

1946-1947

**COURSES OF INSTRUCTION
OFFERED AT LOS ANGELES**

COURSES OFFERED ON THE LOS ANGELES CAMPUS

AGRICULTURAL ECONOMICS

101A. Principles of Marketing Agricultural Products. (3) II.

Prerequisite: Economics 1A-1B.

Mr. R. J. Smith

Nature of the problems, types of marketing agencies, principal marketing functions and their combination, marketing costs and margins, price quotations and speculation in farm products. Government in its relation to marketing; consideration of proposals for improvement.

*116. Agricultural Policy. (3) II.

Mr. R. J. Smith

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. R. J. Smith

The place, purpose and scope of organization; community and farm basis; farm enterprise; selecting farms; planning and equipping; capital needs; earnings.

BIOLOGY

1. Fundamentals of Biology. (3) I and II.

Mr. Haupt, ———

Lectures, three hours.

Students who have taken or are taking Botany 1A or Zoölogy 1 or 15 will not receive credit for Biology 1.

BOTANY

1A. General Botany. (4) I and II.

Miss Scott, Mr. Addicott

Lectures, two hours; laboratory, four hours.

No prerequisite: Biology 1 recommended.

An introduction to the structure, functions and environmental relations of the seed plants.

1B. General Botany. (4) II.

Mr. Haupt, Mr. Plunkett

Lectures, two hours; laboratory, four hours.

Prerequisite: course 1A.

The evolution of the plant kingdom, dealing with the comparative morphology of all the great plant groups.

6. Plant Anatomy. (3) I.

Miss Scott

Lecture, one hour; laboratory, six hours. Fee, \$2.50.

The microscopic structure of the higher plants, with particular reference to the development and differentiation of vegetative tissues.

7. Plant Physiology. (4) II.

Mr. Addicott

Lectures, two hours; laboratory, six hours. Fee, \$3.50.

Prerequisite: Botany 6 and college chemistry.

Experimental work designed to demonstrate various activities of the plant.

* Not to be given, 1946-1947.

103. **Botany of Economic Plants.** (2) II. Miss Scott
Designed for students of economics, geography, agriculture and botany. The general morphology, classification, ecology and geographic distribution, origin and uses of economic plants.
- 105A. **Algae and Bryophytes.** (4) I. Mr. Haupt
Lectures, two hours; laboratory, six hours.
Prerequisite: Botany 1A-1B.
A study of the structure, development, and phylogenetic relationships of the principal orders of fresh water and marine algae, and of liverworts and mosses.
- 105B. **Morphology of Vascular Plants.** (4) II. Mr. Haupt
Lectures, two hours; laboratory, six hours.
Prerequisite: Botany 1A-1B. Fee, \$2.50.
Structure, development and phylogenetic relationships of the principal groups of pteridophytes and spermatophytes.
- 106A-106B. **Angiosperms.** (3-3) Yr. Mr. Lewis
Lecture, one hour; laboratory, six hours, and additional field work.
Prerequisite: Botany 1A-1B.
A survey of the chief orders and families of the flowering plants involving a study of their gross structure, phylogenetic classification, and geographical distribution.
- *107. **Advanced Plant Physiology.** (4) II. Mr. Sponsler
Lectures, two hours; laboratory, six hours.
Prerequisite: Chemistry 1A-1B, 8; Physics 2A-2B; Botany 7. Fee, \$5.50.
Intensive experimental study of various fields of plant physiology.
- *111. **Plant Cytology.** (3) II. Miss Scott
Lecture, one hour; laboratory, six hours. Fee, \$2.50.
Prerequisite: Botany 1A-1B, 6, and 105A or 105B.
Structure and physiology of the cell.
113. **Physiological Plant Anatomy.** (3) II. Miss Scott
Lecture, one hour; laboratory, six hours. Fee, \$2.50.
Prerequisite: Botany 1A-1B, 6 and 7.
A study of the tissues of the higher plants in relation to function; a survey of the visible structural and reserve materials of the plant body.
119. **Mycology.** (3) I. Mr. Plunkett
Lecture, one hour; laboratory, six hours.
Prerequisite: Botany 1A-1B.
Structure, development, and classifications of the more important genera and species of fungi.
- *126. **Medical Mycology.** (4) II. Mr. Plunkett
Lecture, two hours; laboratory, six hours. Fee, \$2.50.
Prerequisite: Botany 1A-1B, 119 and Bacteriology 1.
An introduction to the morphology, physiology, and taxonomy of the fungi which cause disease in man and the domestic animals.
152. **Plant Geography.** (2) I. Mr. Plunkett
Lectures, two hours.
Character, distribution, and environmental relations of the principal vegetation regions of the world.

* Not to be given, 1946-1947.

- *153A-153B. **Advanced Systematic Botany.** (2-2) Yr. Mr. Epling
Prerequisite: Botany 1A-1B, 106A-106B.
A systematic survey of the flowering plants by a comparison of the two principal schemes of relationship; origin of the group and concept of speciation.
190. **Research Methods of Morphology.** (2) I. Mr. Addicott
Laboratory and conference, six hours.
Prerequisite: consent of the instructor. Fee, \$3.50.
Practical introduction to methods of preparing plant tissues and materials for microscopic study.
- 191A-191B. **Molecular Structure of Biological Materials.** (2-2) Yr.
Hours to be arranged. Mr. Sponsler
Prerequisite: Senior standing or consent of the instructor; Physics 2A-2B, Chemistry 8, and Botany 1A-1B or Zoölogy 1, 2, and in addition advanced courses in biological fields.
An adaptation of our knowledge of atomic and molecular structure to biological concepts of protoplasm and cell parts.
- 199A-199B. **Problems in Botany.** (2-2) Yr. The Staff
Prerequisite: senior standing and consent of the instructor.
- 252A-252B. **Seminar in Principles and Theories of Botany.** (2-2) Yr.
Mr. Sponsler
- 253A-253B. **Seminar in Special Fields of Botany.** (1-1) Yr. The Staff
- 278A-278B. **Research in Botany.** (2-6; 2-6) Yr. The Graduate Staff

ENTOMOLOGY

- *1. **General Entomology.** (4) II. _____
Lectures, three hours; laboratory, three hours.
The classification, life history, structure and physiology of insects.
134. **Insects Affecting Subtropical Fruit Plants.** (4) II. Mr. Ebeling
Lectures, two hours; laboratory, six hours. Recommended preparation: Zoölogy 1, Entomology 1.
Biology, economic importance, and control of insects affecting citrus and other subtropical fruits.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr.
Mr. Ebeling
Prerequisite: senior standing and the consent of the instructor.

HORTICULTURE

2. **Elements of Fruit Production.** (3) I. Mr. Chandler
Prerequisite: Botany 1A-1B or equivalent. This course is equivalent to Horticulture 2, given at Berkeley and at Davis.
The principles and practices of fruit growing, with special reference to subtropical regions. The climatic, soil, and moisture requirements and adaptations of fruit trees; selection of site, propagation, planting, orchard management practices, harvesting, and preparation for market.
10. **Plant Propagation.** (2) II. Mr. Cameron
Laboratory, six hours. Prerequisite: Botany 1A-1B.
The principles of plant propagation, with special reference to horticultural plants.

* Not to be given, 1946-1947.

100. **Systematic Pomology.** (4) I. Mr. Schroeder
Lectures, two hours; laboratory, six hours. Prerequisite: course 2, or the equivalent. Fee, \$3.50.

The botanical classification and relationships of the principal fruits; horticultural races and groups; growth and bearing habits; bud and fruit morphology; varietal characters.

101. **Citriculture.** (4) II. Mr. Hodgson, Mr. Schroeder
Lectures, three hours; laboratory, three hours; four Saturday field trips. Prerequisite: Chemistry 1A-1B, course 2 or the equivalent.

The characteristics of the citrus fruits and their responses to environmental influences and cultural practices; the economics of the citrus fruit industry.

102. **Subtropical Fruits Other Than Citrus.** (3) I. Mr. Halma
Lectures, three hours; three Saturday field trips. Prerequisite: course 2 or the equivalent.

A survey of the knowledge concerning the requirements and responses of the subtropical fruit plants other than *Citrus*; the economics of their industries. The fruits considered will include the walnut, pecan, almond, fig, olive, avocado, date, oriental persimmon and certain others of minor importance.

104. **Advanced Horticulture.** (3) I. Mr. Cameron
Lectures and discussions, three hours. Prerequisite: course 2 or the equivalent, Botany 7 or the equivalent, course 100, and course 102.

An analysis of the knowledge concerning the responses of fruit trees to environmental and cultural influences, with special reference to subtropical regions.

113. **Fruit Physiology and Storage Problems.** (2) II. Mr. Biale
Lectures and discussions, two hours. Prerequisite: the consent of the instructor.

Ripening processes of fruit on the tree; maturity standards and tests; ripening and respiration as affected by ethylene gas treatment; chemical and physiological changes at low temperatures; cold storage and refrigerated gas storage; role of volatile substances; differences in species and varietal responses.

*131A-131B. **Taxonomic Classification and Ecology of Ornamental Plants.** (3-3) Yr.

Lectures, two hours; laboratory, three hours. Prerequisite: courses 2 and 10, or the equivalent (course 10 may be taken concurrently). Offered in alternate years.

The botanical classification, relationships, and identification of the more important ornamental plants in southern California, with special emphasis on their environmental requirements and adaptations.

136. **General Floriculture.** (4) I.
Lectures, two hours; laboratory, six hours. Prerequisite: courses 2 and 10, or the equivalent (course 10 may be taken concurrently).

Principles and practices of general floriculture, with special reference to the more important flower crops grown in California.

* Not to be given, 1946-1947.

- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr.
The Staff
Prerequisite: senior standing and the consent of the instructor.

GRADUATE COURSES

- 255A-255B. **Seminar in Horticultural Science.** (2-2) Yr.
The Staff (Mr. Biale in charge)
- 281A-281B. **Research in Plant Science.** (2-6; 2-6) Yr. The Staff

IRRIGATION

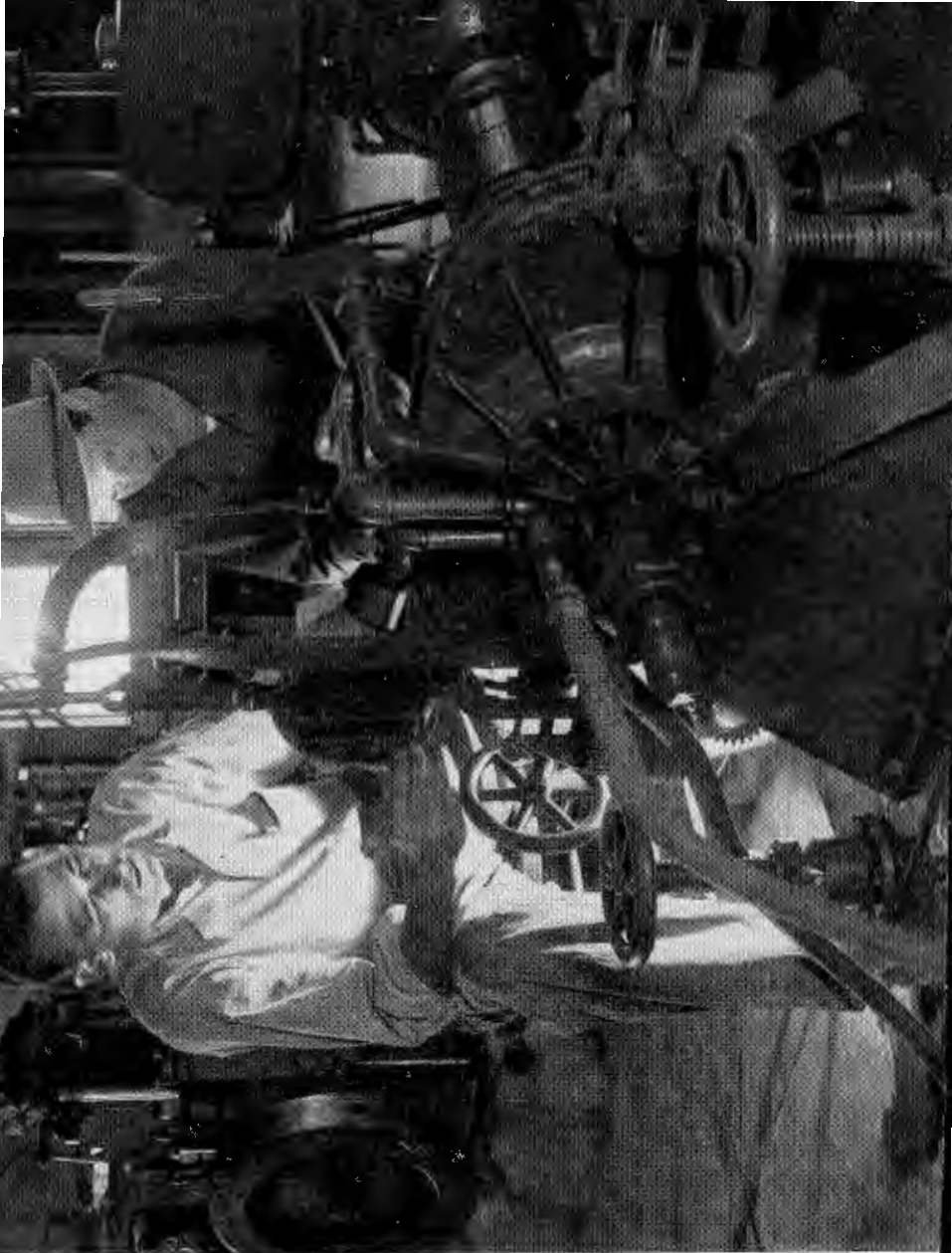
110. **Principles of Irrigation.** (4) I. Mr. Pillsbury
Lectures, three hours; laboratory, three hours. Prerequisite: Physics 2A-2B or the equivalent.
Irrigation as a factor in agriculture; soil-plant water relations; hydraulics of farm irrigation systems.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr.
Mr. Huberty, Mr. Pillsbury
Prerequisite: senior standing and the consent of the instructor.

PLANT PATHOLOGY

120. **Plant Diseases.** (4) I. Mr. Baker
Lectures, two hours; laboratory, six hours. Prerequisite: Botany 1A-1B or the equivalent, and Bacteriology 1. Fee, \$2.50.
A general fundamental course treating of the nature, cause, and control of plant diseases.
130. **Diseases of Subtropical Fruit Plants.** (4) I. Mr. Miller
Lectures, three hours; laboratory, three hours. Prerequisite: Botany 1A-1B or the equivalent, and Bacteriology 1; course 120 is recommended. Fee, \$2.50.
The pathology of citrus and other subtropical fruit plants. The distribution, economic importance, nature, cause, and control of the principal diseases.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr.
Mr. Miller, Mr. Baker
Prerequisite: senior standing and the consent of the instructor.

SOIL SCIENCE

- 110A. **The Soil as a Medium for Plant Growth.** (3) II. Mr. Appleman
Lectures, three hours. Prerequisite: Chemistry 1A-1B, 8.
Nutritional requirements of plants; studies of the absorption of mineral elements by plants, and related processes; chemical composition of soils; current views of the soil solution and of base exchange; factors determining productivity of soils; soil and plant interrelations.
126. **Development and Characteristics of Soils.** (3) II. Mr. Huberty
Three lectures. Prerequisite: Introductory college chemistry and physics; geology recommended.
An introduction to the origin, classification, and utilization of soils and to their physical and chemical properties.
- 199A-199B. **Special Study for Advanced Undergraduates.** (2-4; 2-4) Yr.
Mr. Huberty, Mr. Appleman, Mr. Pillsbury



AN EXERCISE IN AGRICULTURAL ENGINEERING—DAVIS CAMPUS

1946-1947

**COURSES OF INSTRUCTION
OFFERED AT RIVERSIDE**

COURSES OFFERED ON THE RIVERSIDE CAMPUS

GRADUATE COURSES

ENTOMOLOGY

- 200A-200B. **Seminar in Entomology, including Biological Control.** (1-1) Yr.
The Staff (Mr. Boyce in charge)
- 201A-201B. **Research in Entomology.** (2-6; 2-6) Yr.
Mr. Boyce, Mr. Smith
- 205A-205B. **Research in Biological Control.** (2-6; 2-6) Yr. Mr. Smith

HORTICULTURE

- 201A-201B. **Research in Subtropical Horticulture.** (1-6; 1-6) Yr.
Mr. Batchelor, Mr. Condit, Mr. Parker

PLANT PATHOLOGY

- 201A-201B. **Seminar in Plant Pathology.** (1-1) Yr.
The Staff (Mr. Fawcett in charge)
- 230A-230B. **Research in Plant Pathology.** (1-6; 1-6) Yr. Mr. Fawcett

PLANT PHYSIOLOGY

- 203A-203B. **Research in Plant Physiology.** (1-6; 1-6) Yr.
Mr. Bartholomew, Mr. Sinclair
- 205A-205B. **Seminar in Plant Physiology.** (1-1) Yr.
The Staff (Mr. Bartholomew 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)

POSTMASTER: *Return within five days to the
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UNIVERSITY OF CALIFORNIA

BULLETIN

Announcement of the
Two-Year Curricula
IN AGRICULTURE

FOR THE YEAR

1946-1947

COLLEGE OF AGRICULTURE
DAVIS, CALIFORNIA

University of California Bulletin

PUBLISHED AT BERKELEY, CALIFORNIA

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UNIVERSITY OF CALIFORNIA

Announcement of the

TWO-YEAR CURRICULA

College of Agriculture

DAVIS

1946-1947



AERIAL VIEW OF THE DAVIS CAMPUS OF THE COLLEGE OF AGRICULTURE

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CALENDAR, 1946-1947

The College of Agriculture, Davis

Fall Semester, 1946-1947

Sept. 19, Thursday	}	Registration.
Sept. 20, Friday		
Sept. 21, Saturday		Special examinations.
Sept. 23, Monday		Instruction begins.
Oct. 12, Saturday		Columbus Day (Academic and Administrative holiday).
Nov. 28, Thursday	}	Thanksgiving Recess (Academic holiday).
Nov. 30, Saturday		
Dec. 20, Friday	}	Christmas Recess (Academic holiday).
1947		
Jan. 4, Saturday		
Jan. 27, Monday	}	Final examinations.
Feb. 6, Thursday		
Feb. 6, Thursday		Fall Semester ends.

Spring Semester, 1947

Feb. 20, Thursday	}	Registration.
Feb. 21, Friday		
Feb. 22, Saturday		Special examinations.
Feb. 24, Monday		Instruction begins.
May 30, Friday		Memorial Day (Academic and Administrative holiday).
June 9, Monday	}	Final examinations.
June 19, Thursday		
June 19, Thursday		Spring Semester ends.

THE UNIVERSITY OF CALIFORNIA

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- ROBERT GORDON SPROUL, B.S., LL.D., Litt.D., President of the University.
MONROE E. DEUTSCH, Ph.D., LL.D., Vice-President and Provost of the University.
CLAUDE B. HUTCHISON, M.S., LL.D., D.Agr. (hon.c.), Vice-President of the University and Dean of the College of Agriculture.
CLARENCE A. DYKSTRA, A.B., L.H.D., LL.D., Litt.D., Provost of the University.
ROBERT M. UNDERHILL, B.S., Secretary and Treasurer of the Regents.
JAMES H. CORLEY, B.S., Comptroller (General Business Manager).
HERMAN A. SPINDT, M.A., University Admissions Director.
HIRAM W. EDWARDS, Ph.D., Director of Relations with Schools.

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ADMINISTRATIVE OFFICERS†

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STANLEY B. FREEBORN, Ph.D., Assistant Dean of the College of Agriculture (Berkeley), Assistant Director of the Agricultural Experiment Station, and Professor of Entomology.
KNOWLES A. RYERSON, M.S., Assistant Dean of the College of Agriculture (Davis), Professor of Horticulture, and Horticulturist in the Experiment Station.
ROBERT W. HODGSON, M.S., Assistant Dean of the College of Agriculture (Los Angeles), Professor of Subtropical Horticulture, and Subtropical Horticulturist in the Experiment Station.
LEON D. BATCHELOR, Ph.D., Director of the Citrus Experiment Station (Riverside), Professor of Horticulture, and Horticulturist in the Experiment Station.
HARRY R. WELLMAN, Ph.D., Director of the Giannini Foundation (Berkeley), Professor of Agricultural Economics, and Agricultural Economist in the Experiment Station.
J. PRICE GITTINGER, Ed.M., Assistant to the Dean and Supervisor of Student Affairs. 206 Library and Administration Building.
FREDERICK L. GRIFFIN, M.S., Supervisor of the Two-Year Curricula and Associate Professor of Agricultural Education. 206 Library and Administration Building.
JEAN WARREN, Ph.D., Assistant Professor of Home Economics and Adviser to Women. 202 Library and Administration Building.
HOWARD B. SHONTZ, B.S., Recorder. 201 Library and Administration Building.
NELLE U. BRANCH, A.B., Librarian.
IRA F. SMITH, B.S., Assistant Comptroller.
JOHN HOMER WOOLSEY, M.D., Director of Student Health Service and Surgeon.
THOMAS E. COOPER, M.D., Resident Physician.
WILFRED T. ROBBINS, M.D., Assistant Resident Physician.
MARGARET EDDY, Superintendent of Dormitories. 131 North Hall.

† Located at Davis unless otherwise noted.

DIVISIONS AND OFFICERS OF THE TWO-YEAR CURRICULA

- Agricultural Economics*: RICHARD L. ADAMS, ———, FREDERICK L. GRIFFIN.
Agricultural Education: SIDNEY S. SUTHERLAND.
Agricultural Engineering: HARRY B. WALKER, HERBERT L. BELTON, HAROLD D. LEWIS, BEN D. MOSES, LOREN W. NEUBAUER, RUSSELL L. PERRY, JAMES R. TAVERNETTI.
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Animal Husbandry: GEORGE H. HART, HAROLD R. GUILBERT, CARROL E. HOWELL, ELMER H. HUGHES, SYLVESTER W. MEAD, ROBERT F. MILLER, NOEL P. RALSTON.
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Geology: CHARLES M. GILBERT.
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Mathematics and Physics: EDWARD B. ROESSLER, GEORGE A. BAKER, ALBERT C. BURDETTE, CHARLES G. PATTEN.
Military Science: DAVID T. BUTTS, JR.
Physical Education: IRVING F. TOOMEY, VERNARD B. HICKEY, MYRON R. SCHALL, GEORGE A. STROMGREN, EUGENE S. WILSON.
Plant Pathology: JAMES B. KENDRICK, WILLIAM B. HEWITT.
Poultry Husbandry: VIGFUS S. ASMUNDSON, FREDERICK W. LORENZ, F. HOWARD KRATZER.
Public Speaking: CELESTE TURNER WRIGHT, SOLOMON FISHMAN.
Soils: LANNES E. DAVIS, RALPH C. COLE.
Spanish: IVER N. NELSON.
Truck Crops: JAMES E. KNOTT, GLEN N. DAVIS, OSCAR A. LORENZ, PAUL G. SMITH.
Veterinary Science: HUGH S. CAMERON, WILSON B. BELL.
Zoölogy: TRACY I. STORER, MILTON A. MILLER.



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UNIVERSITY OF CALIFORNIA
THE TWO-YEAR CURRICULA IN AGRICULTURE
AT THE COLLEGE OF AGRICULTURE
DAVIS, CALIFORNIA

GENERAL INFORMATION

THE UNIVERSITY OF CALIFORNIA offers prospective farmers, persons preparing for related vocations, and all others interested in California agriculture, a systematic training on a college level in a university atmosphere and a rural environment, even though they may lack formal scholastic qualifications. This opportunity is intended for both men and women. It is open not only to high school graduates, but also to other qualified persons at least eighteen years of age who wish to study agriculture without undertaking a four-year curriculum leading to an academic degree.

Although some courses are required of all students, the studies have been grouped into major-subject programs and listed under three curricula. This grouping facilitates scheduling. It also permits students who have definite vocational objectives to pursue more appropriate programs throughout the four or five semesters of residence.

All candidates for the Certificate of Graduation must complete a minimum of 64 semester units of work, including certain prerequisite courses, taken in the sequence specified in each major-subject program. Veterans and other special adult students who can remain in residence only one or two semesters may enroll for special programs in which the prerequisites are waived. All special programs, however, must have the approval of the major-subject adviser and of the instructors concerned.

THE UNIVERSITY FARM AND THE DAVIS CAMPUS

The Davis campus of the College of Agriculture is an integral part of the University Farm, which is located in Yolo County, 13 miles west of Sacramento, on Highways 99W and 40. The first unit of the University Farm, now comprising 1,650 acres, was purchased in 1906; and instruction began two years later. The soil and climate are typical of the great interior valleys of California, and the crops are those grown in most parts of the State. Wells equipped with different types of deep-well pumps supply the irrigation water which is distributed over the fields and experimental plots by a modern concrete-pipe irrigation system.

Facilities for Instruction.—The University Farm has ample facilities for practical and technical instruction in the various phases of agriculture. It is equipped with ten modern reinforced concrete buildings, housing most of the classrooms and laboratories; an apiary; a dairy; a creamery; five large green-

houses; shops; barns; student orchards; vineyards; vegetable plantings; devices for measuring irrigation water; an up-to-date collection of agricultural tools and implements; herds and flocks of the principal breeds of cattle, sheep, hogs, horses, poultry, and turkeys. Adjacent livestock farms, vineyards, orchards, and diversified farms offer additional opportunities for study, demonstration, and judging.

The Animal Science, Chemistry, Dairy Industry, Gymnasium, Horticulture, Irrigation Laboratory, Enology, Library and Administration, Agronomy Seed House, and Agricultural Engineering buildings are modern concrete structures, designed for research and instructional purposes. The following divisions have fields and laboratories at Davis: agricultural engineering, agronomy, animal husbandry, botany, chemistry, dairy industry, entomology and parasitology, home economics, decorative art, irrigation, landscape gardening, plant pathology, pomology, poultry husbandry, soil science, truck crops, veterinary science, viticulture, and zoölogy. Instruction is also offered in agricultural economics, education, English, French, geology, German, history, mathematics, military science, physical education, physiology, physics, psychology, Spanish, and public speaking.

Transportation.—The city of Davis, on the transcontinental line of the Southern Pacific Railroad, is the junction for trains running between the San Francisco Bay cities, way points in northern California, and eastern points. The Pacific Greyhound Lines maintain in Davis a bus depot, with frequent service to Berkeley, Oakland, San Francisco, Sacramento, and other main- and inter-connecting-line cities.

SPECIAL TRAINING OPPORTUNITIES FOR VETERANS

In addition to the regular Four-Year Degree Curricula in agriculture available at Berkeley, Los Angeles, and Davis, and to the regular Two-Year Curricula offered at Davis, special one- and two-semester programs in applied agriculture are offered at Davis for veterans and other adult students. These special programs have no admission requirements; the usual prerequisite courses and special and regular examinations may be waived. All students working toward the Certificate of Completion, however, must comply with the regulations of the Two-Year Curricula.

Office of Veterans' Affairs.—Davis, like the other campuses of the University where undergraduate training is offered, has an Office of Veterans' Affairs, headed by a Coördinator. This office works to facilitate the assimilation of veterans into the student body and acts as a clearing house for the varied items of business affecting the welfare of veterans, especially those who are participating in the educational benefits afforded by the State and Federal governments. Of primary importance is the possession of a *certificate of eligibility* or similar document to be presented at the time of registration. Such official statement, attesting a right to the training provided by the State or Federal

governments, may be obtained from the proper representative of the California Veterans' Welfare Board or the U. S. Veterans' Administration. Ex-servicemen without these credentials will, of course, be admitted as regular or special students upon presentation of their honorable-discharge papers; but they will be held for the regular fees and other charges applicable to regular or special students.

POSITIONS OPEN TO GRADUATES

Most of the graduates and former students in the University Farm School and the later Nondegree and Two-Year Curricula are either managing their own farms or are employed as farm managers and foremen; this situation will probably prevail in the future as in the past. Some of the older alumni, however, are now engaged in related agricultural vocations; many of the more recent graduates and former students are in uniform.

Close contacts with the agricultural industry of the State enables members of the teaching and research staff to anticipate the demands for trained men in the various fields of agriculture, to reflect in their instruction the changing needs of the farming industry, and to recommend graduates for suitable employment. Positions of responsibility usually require, besides the regular college courses, one or more seasons of practical training obtained under commercial conditions. Such experience, with the opportunity to form advantageous business connections leading to permanent employment, may be obtained during summer vacations or by serving an apprenticeship after graduation. Much depends upon the candidate's inherent ability.

Many different vocations have been open to graduates of the two-year curricula in the past, and the demand for trained personnel still continues. Positions that pay adequate wages and give opportunity for advancement often are available for assistant buttermakers, cheesemakers, ice-cream makers, milk testers, and assistant technicians in commercial dairy-manufacturing and distribution plants; herdsmen; advanced registry testers; skilled poultry and apiary workers; horticultural and dairy inspectors; field agents in the fruit-and-vegetable standardization and shipping-point inspection services; caretakers of private estates; foremen of public parks, landscape contractors, nurserymen, and florists; field men, salesmen, and skilled workers for seedsmen; weed and rodent control specialists; workers skilled in controlling insect and other household and farmstead pests; plant- and disease-control specialists and contractors; ditch tenders and foremen of water delivery for irrigation districts and large farm enterprises. The rapidly expanding field of food preservation (canning, dehydration, and freezing storage) offers new opportunities to graduates in truck crops and horticulture.

PRACTICAL FARM EXPERIENCE

Many of the courses in animal and plant production can be undertaken most advantageously by students with a background of farm experience. There is opportunity to obtain practical training on the University Farm, but those interested must seek it on their own initiative, since no formal farm-practice courses are offered. As a rule, such desirable experience can be most easily and efficiently obtained on commercial farms during the precollege years or by an intensive apprenticeship after the college courses have been completed. Summer-vacation employment is usually too specialized to afford generalized farm training.

MATRICULATION ADJUSTMENT PROGRAMS

High school graduates desiring to undertake work leading to the degree of Bachelor of Science, but denied freshman standing because of matriculation or grade-point deficiencies incurred either in high school or college, may enroll in the Two-Year Curricula and, by the satisfactory completion of certain courses, be formally admitted to the University.

The removal of matriculation deficiencies must be accomplished according to the regulations of the University of California Board of Admissions. When applying for admission in the College of Agriculture, every candidate must present a transcript of all high school and college work undertaken.

The method of removing deficiencies will depend upon their nature and number; a student's study program may consist of courses numbered 1-49, 50-99, or a combination of both types of work, as determined by the Director of Admissions. Each high school unit of a subject deficiency may be removed by the completion of an approved 3-unit course with a grade of C or higher.

Students with *matriculation deficiencies* may transfer to the Four-Year Curricula after removing such deficiencies, provided they have completed a minimum program (12 units) of work with a scholarship record of a C average or higher.

Grade-point deficiencies may be removed only by the completion of regular degree courses with grades of A or B. A student with more than 12 grade-point deficiencies is required to complete satisfactorily a minimum of 12 units in the Two-Year Curricula before he may enroll in a Four-Year Curriculum.

Students who have been transferred to the Four-Year Curricula after completing work in the Two-Year Curricula may petition for lower division credit by examination for courses completed in the 50-99 group.

No student will be given repeated opportunities to remove matriculation deficiencies; and, except in very special instances, University admission requirements must be completed within two semesters.

CLASSIFICATION OF STUDENTS AT DAVIS

For administrative purposes, students at Davis are classified into four groups on the basis of their academic preparation or their professional and vocational objectives:

Group I. *Four-year students seeking the bachelor's degree.* All students who have fulfilled the requirements of the University for entrance to Four-Year Curricula leading to the bachelor's degree are given this classification.

Group II. *Students with deficiencies desirous of qualifying for admission to the Four-Year Curricula.* This group includes high school graduates with minor matriculation deficiencies; also transfer students from other colleges who have minor grade-point or matriculation deficiencies.

Group III. *Two-year students working for the Certificate of Graduation.* Only high school graduates, veterans, and specially qualified students more than 18 years of age who are not high school graduates will be granted the opportunity to complete the requirements for graduation from the Two-Year Curricula in Agriculture.

Group IV. *Special students.* Special students are those veterans and other mature persons who can remain in residence only one or two semesters or less but who, because of their previous training and experience, may profit by the special opportunities afforded. Credit so received may be counted towards graduation if other graduation requirements are met.

Visitors.—Special students who can remain in residence only a few weeks may register as visitors, and be granted special privileges for a brief period of intensive study with some member of the staff. Visitors pay a fee of \$3 for the first week and \$2 for each additional week of residence, the full amount payable in advance. Each must have his application approved by the Assistant Dean and endorsed by the staff member under whom he wishes to study. Except for conduct, visitors are not held for the same academic regulations as are regular students. They may have full use of the Library, but are not entitled to the service of the Student Health Center.

THE TWO-YEAR CURRICULA

Requirements for Graduation

The Certificate of Graduation from the Two-Year Curricula in Agriculture will be awarded by the University of California to students completing the following requirements:

1. A minimum of 64 units of credit* including the required courses, and at

* A unit of credit represents three hours of work for sixteen weeks. This work will be distributed, at the instructor's discretion, in the form of classroom or laboratory activity and out-of-class preparation. The normal study-list schedule averages 16 units each semester, enabling students to graduate in two years. Exceptionally capable students may undertake as many as 18 units at a time.

least as many grade points (or quality units) as there may be quality units in the credit value of all courses undertaken in the Two-Year Curricula.

2. The specified courses in American History and Institutions, English, and Mathematics (or the passing of alternative examinations in these subjects), and the required courses in any major-subject program.

3. Attendance at the Commencement Exercises of the University of California, Berkeley.

Graduation with Honors

Every two-year student who receives a minimum of 160 grade points in completing 64 units of credit within a two-year period of instruction is awarded not only the Certificate of Graduation, but also a special Honor Certificate.

Advanced Standing

Candidates for graduation from the Two-Year Curricula may receive credit by petition for equivalent courses completed in junior colleges or other institutions of collegiate rank, or for courses of college level in the natural and social sciences, mathematics, languages, and literature. In every instance, however, one year of residence and a minimum of 32 units of course work in the Two-Year Curricula at Davis are required for the Certificate of Graduation.

ARRANGEMENT OF PROGRAMS OF STUDY

The Two-Year Curricula have been devised for high school graduates or qualified persons at least eighteen years of age who desire systematic instruction in agriculture.

One-semester and one-year programs.—More mature students, especially veterans and persons with considerable practical experience, who can remain only one or two semesters, may elect any combination of the courses available, provided they obtain the consent of the instructor in courses whose prerequisites they have not fulfilled.

Matriculation adjustment programs.—Special study programs will be outlined for students wishing to meet the University entrance requirements for the Four-Year Curricula. The courses prescribed will depend upon the nature of the student's matriculation deficiencies (see page 12).

Major-subject programs.—Two-year major-subject programs are outlined for those specializing in certain fields or preparing for a definite farming vocation. The courses comprising these programs, as well as their sequence, have been carefully arranged by the major-subject divisions. To meet the requirements for graduation and to avoid conflicts, students are advised to follow any given two-year program as it is outlined in this Announcement.

Students entering in the spring semester must follow a somewhat different sequence of courses from that suggested for fall entrants. Such students, including those enrolling for general or elective programs, may encounter

conflicts in their study schedules which are difficult to adjust, since the Two-Year Curricula have been devised primarily for fall entrants. Hence five semesters' residence may be necessary to complete the work required for graduation in their major field.

Students wishing to graduate from the Two-Year Curricula must complete all the courses prescribed in some major-subject program as listed or, if pursuing a general all-elective program, must take whatever courses may be available each semester.

MISCELLANEOUS INFORMATION

REGISTRATION

The prospective student should plan to arrive in Davis on Thursday of registration week. Formal registration should be completed by Friday afternoon. All new students and those returning after an absence may be required to take certain tests which are administered at specified hours on Saturday. A late examination fee of \$1 is charged any student who fails to take a required examination at the prescribed time.

FEES

Tuition fee.—Tuition is free to residents of California. The student classed as a nonresident pays a tuition fee of \$150 a semester. (See the CIRCULAR OF INFORMATION, Berkeley or Los Angeles, for regulations concerning this fee.)

Incidental Fee.—The incidental fee for the student at Davis is \$25 each semester. This fee, which must be paid at the time of registration, covers certain expenses of students for library books, for athletic and gymnasium facilities and equipment, for lockers and washrooms, for registration and graduation, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service. No part of this fee is remitted to the student who does not wish to make use of all or any of these privileges.

The incidental fee at Davis also includes the student-body membership fee. Membership privileges include participation in student affairs, a free subscription to the student newspaper, free admission to many athletic contests and reduced admission rates to others, and membership in the Associated Students' store.

Laboratory fees.—A laboratory fee of \$5 per semester is charged each student enrolled in the Two-Year Curricula.

LIVING ACCOMMODATIONS AND EXPENSES

The University maintains three dormitories for men and women and a dining hall at the College of Agriculture at Davis. Board in the dining hall, on the cafeteria plan, costs from \$40 to \$50 a month. The price is approximately the same in the city of Davis and in the various fraternities and clubhouses. All

students are invited to patronize the dining hall operated on the campus for their convenience.

A dormitory room for one person costs \$12.50 to \$15 a month. Rooms contain necessary furniture, linen, and blankets; the room rent includes the weekly laundering of linen. The rooms available will be reserved in the order of receipt of a deposit of \$3, which will apply on the first month's rent. This deposit will be returned if the applicant is not admitted to a dormitory. Reservations will not be held after the first day of registration except by special arrangement with the Comptroller's office. If reservations are not used or canceled after the first day of instruction, the deposit will not be refunded. Accommodations are provided for both men and women students. To reserve a room, send \$3 to the Comptroller's Office, College of Agriculture, Davis, California. Money orders or bank drafts should be made payable to The Regents of the University of California.

Besides the University dormitories, six fraternities, three hotels, and many private homes provide living accommodations. Board and lodging at other living quarters in Davis range from \$50 to \$60 per month. Information concerning off-campus living may be obtained upon request from the Office of the Dean.

All undergraduate women students under 21 years of age are required at the time of registration to have their college residence approved by the Adviser to Women. This approval is given to women students living with their parents and to those living in the University dormitory or in houses approved by the University.

OPPORTUNITIES FOR PART-TIME EMPLOYMENT

Self-supporting students are respected. A diligent student may spend 12 to 25 hours a week in outside employment while undertaking a study program of from 12 to 16 units, which requires 36 to 48 hours of work a week. The student seeking employment should bear in mind, however, that not every kind or amount of outside work is compatible with his main purpose at the University, namely, his education. In the main, students engaging in many hours of outside employment must forego participation in extra-curricular activities.

Only rarely may a student be entirely self-supporting. No student who intends to support himself should enter the University without sufficient funds to cover the expenses of the first semester.

Students seeking employment should apply to the Assistant Dean's Office.

LOANS

A number of loan funds have been established for students of agriculture, such as the Thomas Forsyth Hunt Memorial Loan Fund, the Emergency Loan Fund, the University Farm Circle Loan Fund, and the Aggie Alumni Loan Fund. Applications for loans should be made to the Assistant Dean.

STUDENT ACTIVITIES

On the Davis campus nearly every form of activity is maintained. The entire student body are members of the Associated Students of the California Aggies, which governs all student affairs on the campus and supervises the Honor System.

The students at Davis publish *El Rodeo*, a yearbook, and the *California Aggie*, a weekly newspaper.

Opportunity to participate in many forms of athletics is presented. The California Aggies are members of the Far Western Conference and stress both intercollegiate and intramural athletics. The major sports include football, basketball, boxing, track, and baseball; the minor sports are tennis, wrestling, golf, riding, swimming, and skiing.

The Associated Students of the California Aggie support other activities as well. These include the band, the orchestra, the men's and women's choruses, debating, dramatics, radio broadcasting, and the rifle team. The California Club, designed to emphasize the unity of student life on all campuses of the University, is active.

Many organizations sponsor the development of special interests at Davis. The Blue and Gold Dairy Club, the Golden Hoof Club, the Horticultural Round Table, the Home Economics Club, the Senior 4-H Club, and the Gilmore Collegiate Chapter of the Future Farmers of America meet regularly to hear outstanding speakers and to enjoy social contacts. The Music Association encourages the further use of talents; the Women's Association includes all women students on the campus; the International Forum promotes friendly relations between foreign-born and native students and studies world problems; and the Newman Club and the Christian Association meet for religious and social purposes.



READING ROOM, LIBRARY

THE TWO-YEAR CURRICULA AND MAJOR-SUBJECT PROGRAMS

ANIMAL-PRODUCTION CURRICULUM

ANIMAL HUSBANDRY

The two-year program in Animal Husbandry is outlined for students primarily interested in horses, dairy cattle, beef cattle, hogs, sheep, or other domestic animals.

Animal Biology 51A-51B may be applied toward meeting the 12 units in Animal Husbandry required for graduation in this major-subject program.

The courses in Animal Husbandry are described on pages 28 and 29.

FIRST YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
√ A. H. 50. Principles of Animal Husbandry	4	An. Biol. 51B. Animal Biology	3
An. Biol. 51A. Animal Biology	3	A. H. 52. Feeds and Feeding	3
Chem. 50. Elementary Chemistry	3	Agron. 52. Cereal and Forage Crops	3
✓ Math. 50. Agricultural Mathematics	3	English 50. Effective Writing	3
✓ Ag. Eng. 50. Farm Mechanics	3	Elective	4
	16		16

SECOND YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
*A. H. 61 Swine Production	2	*A. H. 56. Horse Production	2
*A. H. 63. Beef Production	2	*A. H. 58. Milk Production	2
Vet. Sci. 51. Animal Hygiene	2	*A. H. 64. Sheep Production	2
Bact. 61. Elementary Bacteriology	2	Ag. Eng. 52. Farm Structures	3
Irrig. 53. Irrigation Practice	3	Soils 52. Soils	3
Hist. 57A. History and Institutions of the United States	2	Elective	4
Elective	3		
	16		16

DAIRY HUSBANDRY

Students primarily interested in milk production, cow testing, and related work may include the necessary courses in Dairy Industry by following this two-year subject-matter program. Unless the semester sequence of courses is undertaken in the manner indicated, a student cannot meet the requirements for graduation within 4 semesters.

The courses in Animal Husbandry and Dairy Industry are described on pages 28-29 and 30-31, respectively.

* Electives. A minimum of 12 units of Animal Husbandry subjects, including Animal Biology, are required to satisfy the major-subject requirement.

FIRST YEAR			
<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
A. H. 50. Principles of Animal Husbandry	4	D. I. 54. Market Milk	3
D. I. 50. Elements of Dairying	3	A. H. 52. Feeds and Feeding	3
An. Biol. 51A. Animal Biology	3	An. Biol. 51B. Animal Biology	3
Math. 50. Agricultural Mathematics	3	Engl. 50. Effective Writing	3
Chem. 50. Elementary Chemistry	3	Elective	4
	—		—
	16		16
SECOND YEAR			
<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
Ag. Eng. 57. Dairy Mechanics	3	Ag. Eng. 52. Farm Structures	3
Vet. Sci. 51. Animal Hygiene	2	A. H. 58. Milk Production	2
Bact. 61. Elementary Bacteriology	2	Agron. 52. Cereal and Forage Crops	2
Ag. Econ. 53. Farm Management	3	Ag. Econ. 56. Farm Bookkeeping	3
Hist. 57A. History and Institutions of the United States	2	Elective	6
Elective	4		—
	—		—
	16		16

POULTRY HUSBANDRY

The beginning course in Poultry Husbandry is designed to give a general working knowledge of poultry production. The other courses provide the additional instruction needed by those who expect to engage in some phase of the industry such as commercial egg production, poultry breeding, hatchery operation, feed sales and service work, turkey production, or gamebird propagation.

The courses in Poultry Husbandry are described on pages 38 and 39.

FIRST YEAR			
<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
P. H. 51. Poultry Production	3	P. H. 52. Poultry Production	3
An. Biol. 51A. Animal Biology	3	A. H. 50. Principles of Animal Husbandry	4
Chem. 50. Elementary Chemistry	3	An. Biol. 51B. Animal Biology	3
Math. 50. Agricultural Mathematics	3	Agron. 52. Cereal and Forage Crops	3
Ag. Eng. 50. Farm Mechanics	3	Engl. 50. Effective Writing	3
	—		—
	15		16
SECOND YEAR			
<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
P. H. 55. Utility Poultry Breeding	2	P. H. 56. Turkey Production	2
P. H. 57. Poultry Nutrition	2	Ag. Eng. 52. Farm Structures	3
Bact. 61. Elementary Bacteriology	2	†Ag. Econ. 56. Farm Bookkeeping	3
Vet. Sci. 51. Animal Hygiene	2	‡Elective	8
†Ag. Econ. 53. Farm Management	3		—
Hist. 57A. History and Institutions of the United States	2		—
*Elective	4		—
	—		—
	17		16

* Poultry Husbandry 53. Incubation and Brooding Practice (3 units) may be elected with the consent of the instructor.

† Recommended electives.

‡ Poultry Husbandry 54. Pen Practice (2 units) may be elected with the consent of the instructor.

DAIRY INDUSTRY CURRICULUM

DAIRY INDUSTRY

The two-year major program in Dairy Industry is primarily concerned with the handling of milk and the manufacture of dairy products. The courses are designed for persons who wish to qualify as buttermakers, cheesemakers, ice-cream makers, milk-plant workers, laboratory workers, and dairy inspectors.

The courses in Dairy Industry are listed on pages 30 and 31.

FIRST YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
✓ D. I. 50. Elements of Dairying . . .	3	D. I. 54. Market Milk	3
✓ D. I. 51. Cheesemaking	3	*Ag. Econ. 50. Economics	3
✓ A. H. 50. Principles of Animal Husbandry	4	*Ag. Eng. 52. Farm Structures . . .	3
✓ Engl. 50. Effective Writing	3	Chem. 50. Elementary Chemistry . .	3
✓ Math. 50. Agricultural Mathematics	3	Elective	3
	16		15

SECOND YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
Ag. Eng. 57. Dairy Mechanics . . .	3	D. I. 52. Buttermaking	3
D. I. 60. Creamery Practice	3	*D. I. 58. Dairy Plant Management .	4
D. I. 53. Ice-Cream Making	3	*Pub. Spk. 50. Public Speaking . . .	3
Bact. 61. Elementary Bacteriology .	2	*†A. H. 58. Milk Production	2
Hist. 57A. History and Institutions of the United States	2	Elective	4
Elective	4		
	17		16

PLANT PRODUCTION CURRICULUM

AGRONOMY

The major-subject program in Agronomy, as outlined below, has been formulated for students planning to engage in general farming or in special work that involves grading, standardization, and inspection of the control of noxious weeds, insect pests, and plant diseases of field crops. The courses listed are required of all students whose major is Agronomy.

By changing the sequence of certain courses, a student may include, besides the required work in Agronomy, additional units in Agricultural Engineering, Animal Husbandry, or Truck Crops.

The courses in Agronomy are described on page 28.

FIRST YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
Agron. 51. Introductory Course . . .	3	Agron. 52. Cereal and Forage Crops	3
Botany 50. Elementary Botany . . .	3	Ag. Eng. 54. Farm Machinery . . .	3
Math. 50. Agricultural Mathematics	3	Engl. 50. Effective Writing	3
Irrig. 53. Irrigation Practice	3	Hist. 57B. History and Institutions of the United States	2
T. C. 50. Truck Crops	3	Hort. 50. Fruit Growing	3
		Elective	3
	15		17

* Recommended electives.

† See prerequisites.

SECOND YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
Agron. 53. Miscellaneous Crops . . .	3	Agron. 54. Agricultural Seeds	3
Ag. Eng. 55. Farm Power	3	Soils 52. Soils	3
Botany 51. Weed Control	2	Pl. Path. 52. Plant Diseases	3
Entom. 51. Entomological Practice	3	T. C. 52. Vegetable Improvement . . .	3
Ag. Econ. 54. Farm Management . . .	3	Elective	4
Elective	2		
	—		—
	16		16

HORTICULTURE

The program in Horticulture deals with the production of tree fruits and grapes under California conditions and with certain phases of their utilization. Field and laboratory facilities and classroom instruction are provided to give opportunity for a critical study of the establishment of new orchards and vineyards; pruning and training of trees and vines; cultivation, irrigation, and fertilization of orchards and vineyards; varieties; harvesting and packing of fruit for fresh shipment; inspection and marketing of fruits; drying of raisins, prunes, peaches, apricots, and pears. The program is designed as basic training for students who plan to operate and manage their own orchards and vineyards; to be orchard and vineyard foremen, managers, or superintendents; or to work in the inspection and standardization of horticultural products.

Students who plan to complete the two-year program may take the maximum number of courses offered and will have least difficulty in arranging schedules if the following courses are taken in the sequence suggested below. Those entering in the spring semester may arrange a similar sequence of courses with the aid of their advisers.

The courses in Horticulture are described on pages 32 and 33.

FIRST YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
Hort. 50. Fruit Growing	3	Hort. 54. Orchard Operation	2
Hort. 53. Orchard Operation	2	Soils 52. Soils	3
Botany 50. Elementary Botany . . .	3	Engl. 50. Effective Writing	3
Math. 50. Agricultural Mathematics	3	Hist. 57B. History and Institutions of the United States	2
Elective	5	Elective	6
	—		—
	16		16

SECOND YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
Entom. 51. Entomological Practice . .	3	Hort. 52 or 62	2-3
Irrig. 53. Irrigation Practice	3	Pl. Path. 52. Plant Diseases	3
Elective	10	Elective	11-10
	—		—
	16		16

At least 12 units of Horticultural subjects and 6 units of Agricultural Engineering should be included.

Students especially interested in grape growing may substitute Horticulture 61 for Horticulture 53, and Horticulture 62 for Horticulture 54.

Recommended Electives

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
Hort. 59. Citrus and Subtropical Fruits	3	Hort. 52. Plant Propagation	2
Hort. 61. Viticulture	3	Hort. 62. Vineyard Operations	3
Ag. Eng. 50. Farm Mechanics	3	Ag. Eng. 52. Farm Structures	3
Ag. Eng. 55. Farm Power	3	Ag. Eng. 54. Farm Machinery	3
Ag. Econ. 50. Economics	3	Ag. Econ. 50. Economics	3
Botany 51. Weed Control	3	Ag. Econ. 56. Farm Bookkeeping	3
T. C. 51. Vegetable Growing	3	Entom. 52. Beekeeping	3
L. G. 50. Landscape Gardening	4		
Ag. Econ. 53. Farm Management	3		
Agron. 50. Introduction to Agronomy	3		

LANDSCAPE GARDENING

The major-subject program is designed to prepare men and women for the practical business of landscape gardening and contracting (executing the plans and specifications of landscape architects); for the management of private estates; for ornamental nursery work; for commercial floriculture; and for the development of urban homes and rural farmsteads.

This work is not designed to prepare persons for professional practice of landscape architecture, since five or more years of University training are essential for such work.

Students with previous training or experience may elect, with the instructor's consent, courses of special interest sufficient to make up a special one-year program.

The courses in Landscape Gardening are described on page 34.

FIRST YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
L. G. 50. Landscape Gardening	4	L. G. 56 Floriculture	2
L. G. 55. Floriculture	2	Hort. 50. Fruit Growing	3
Ag. Eng. 51. Drawing	2	Hort. 52. Plant Propagation	2
Botany 50. Elementary Botany	3	Math. 50. Agricultural Mathematics	3
English 50. Effective Writing	3	Soils 52. Soils	3
Elective	2	Elective	3
	16		16

SECOND YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
L. G. 51. Plant Materials	2	L. G. 54. Nursery Practice	2
L. G. 58. Nursery Practice	2	L. G. 60. Advanced Landscape Gardening	4
Entom. 51. Entomological Practice	3	Pl. Path. 52. Plant Diseases	3
Hist. 57A. History and Institutions of the United States	2	T. C. 52. Vegetable Improvement	3
Elective	7	Elective	4
	16		16

TRUCK CROPS

The beginning course in Truck Crops is designed to give a general understanding of the subject. Advanced courses are planned primarily for students especially interested. A course in seed growing and in methods of improving vegetable varieties is offered for those who may become connected with the seed-growing industry. Truck Crops majors may undertake a special program in vegetable production. Vegetable seed-growing establishments and large centers of truck-crop production will be visited as a phase of the work in Truck Crops 53.

The division is well equipped with land and with packing-shed, greenhouse, and coldframe facilities, as well as a large field laboratory. The courses in Truck Crops are described on page 40.

FIRST YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
T. C. 51. Truck Crops	3	T. C. 52. Vegetable Improvement	3
Agron. 51. Introductory Course	3	Hort. 50. Fruit Growing	3
Botany 50. Elementary Botany	3	Engl. 50. Effective Writing	3
Math. 50. Agricultural Mathematics	3	Hist. 57B. History and Institutions of the United States	2
Irrig. 53. Irrigation Practice	3	Elective	6
	—		—
	15		17

SECOND YEAR

<i>Fall Semester</i>	Units	<i>Spring Semester</i>	Units
T. C. 53. Vegetable Varieties	3	T. C. 54. Advanced Truck Crops	2-4
Botany 51. Weed Control	2	Pl. Path. 52. Plant Diseases	3
Entom. 51. Entomological Practice	3	Soils 52. Soils	3
Agron. 53. Miscellaneous Crops	3	Ag. Eng. 54. Farm Machinery	3
Ag. Eng. 55. Farm Power	3	Elective	5-8
Elective	3		—
	—		—
	17		16

COURSES OF INSTRUCTION

CLASSIFICATION AND NUMBERING

The Two-Year Curricula courses (numbered 50-99) are designed to meet the special needs of students on the Davis campus. They afford, on the college level, semiprofessional and advanced vocational training in the different fields of agriculture, as well as elective opportunities in history, languages and literature, mathematics and science.

ABBREVIATIONS

The credit value of each course in units is indicated by a number in parentheses after the title. The session in which the course is given is shown by the roman numeral I for the fall semester, or II for the spring semester. A course given throughout these two semesters is designated Yr. The hours, when not stated, will be arranged. The final assignment of hours on each campus is made in a printed SCHEDULE which is available at the time of registration.

Year Courses.—A course given throughout the fall and spring semesters is designated by a double number. Animal Biology 51A-51B is an example. Each half of the course constitutes a semester's work. The first half is prerequisite to the second unless there is an explicit statement to the contrary. The instructor makes a final report on the student's work at the end of each semester. Unless otherwise noted, the student may take the first half only and receive final credit for it.

Credit.—One unit of credit is given for three hours of student effort per week throughout the semester. The three hours may be devoted to lectures, class discussions, laboratory work, field trips, or out-of-class preparation, at the discretion of the instructor.

AGRICULTURAL ECONOMICS

50. **Elementary Economics.** (3) I and II. Mr. Griffin
Tu Th, 8, and one hour to be arranged.
Economic principles, practices, and institutions.
53. **Farm Management.** (3) I. Mr. Adams, Mr. ———
Lecture, Tu Th, 11; laboratory, Tu, 1-4.
Prerequisite: at least two semesters of two-year work, or special permission of the instructor.
54. **Farm Bookkeeping.** (3) II. ———
Lecture, Tu Th, 10; laboratory, Tu, 1-4.
Bookkeeping, enterprise accounting, and budget-making as applied to agriculture.



ORCHARD PRACTICE IN HORTICULTURE

AGRICULTURAL ENGINEERING

50. **Farm Mechanics.** (3) I and II. Mr. Lewis
I. Lecture, Tu Th, 10; laboratory, Sec. 1, Tu, 1-4; Sec. 2, W, 1-4.
II. Lecture, M W, 10; laboratory, W, 1-3.
Forging; metal working; tool conditioning; power transmission as applied to line-shaft equipment and small power machinery; plumbing; soldering; sheet-metal work; arc and acetylene welding and cutting.
51. **Drawing.** (2) I. Mr. Neubauer
Lecture, M, 11; laboratory: Sec. 1, M, 1-4; Sec. 2, F, 1-4.
Study and preparation of freehand sketches, mechanical and detail drawing, orthographic plans, oblique, isometric, and perspective views; maps, and graphs.
52. **Farm Structures.** (3) II. Mr. Belton
Lecture, M W, 8; laboratory, Tu, 1-4.
Prerequisite: Mathematics 50.
Planning of farm structures; estimating of materials and cost; principles of framing; concrete work; and painting.
53. **Farm Electricity.** (2) I. Mr. Tavernetti
Lecture, W, 11; laboratory: Sec. 1, W, 1-4.
Prerequisite: permission of the instructor.
Principles, construction, operation, installation, and maintenance of electric heating, lighting, and power equipment.
54. **Farm Machinery.** (3) II. Mr. French
Lecture, Tu Th, 10; laboratory, Tu, 1-4.
Prerequisite: Mathematics 50.
The mechanical principles; construction, and adjustment, and operation of tillage, seeding, harvesting machinery, and pest-control equipment; construction and testing of displacement and centrifugal pumps.
55. **Farm Power.** (3) I. Mr. Tavernetti
Lecture, M W, 9; laboratory: Sec. 1, M, 1-4; Sec. 2, Tu, 1-4.
Prerequisite: Mathematics 50.
Principles, construction, operation, and maintenance of Diesel engines, gas engines, tractors, and electric motors.
57. **Dairy Mechanics and Refrigeration.** (3) I. Mr. Perry
Lecture, Tu Th, 8; laboratory, Tu, 1-4.
Prerequisite: Mathematics 50.
Principles of steam generation and use, electricity, hydraulics, refrigeration and air conditioning with their application to agriculture.

AGRONOMY

51. Introduction to Agronomy. (3) I. _____

Lectures, M W F, 11.

The principles and practices of field-crop production. Cropping systems to maintain fertility and soil productivity; including soil improvement, rotations, fertilization, erosion control, and the processes of land preparation, seeding, and tillage.

52. Cereals and Forage Crops. (3) II. _____

Lectures, Tu Th, 11; laboratory: Sec. 1, W, 1-4; Sec. 2, Th, 1-4.

Classification, production, and use of the small grains, corn sorghum, hay, pasture, and succulent crops.

53. Miscellaneous Field Crops. (3) I. _____

Lectures, Tu Th, 9; laboratory, W, 1-4.

Adaptation, production, and use of the field bean, fiber, sugar, oil, and other field crops.

54. Agricultural Seed and Commercial Grading. (3) II _____

Lectures, Tu Th, 10; laboratory, Th, 1-4.

Prerequisite: Agronomy 50, 52, 53.

Commercial grading of field crops, such as cereals, grain sorghums, flax, beans, and hay. Factors determining quality of agricultural seed; germination, purity, weed seeds, seed cleaning and storage. Review of seed laws.

ANIMAL BIOLOGY

51A-51B. Animal Biology. (3-3) Yr.

Mr. Storer in charge, Mr. Asmundson, Mr. Cole, Mr. Goss,
Mr. Gregory, Mr. Kleiber, Mr. Kratzer, Mr. Lorenz,
Mr. M. A. Miller

Lecture, M W F, 9; demonstration and quiz sections: Sec. 1, W, 1-2; Sec. 2, W, 2-3; Sec. 3, W, 3-4; Sec. 4, Th, 1-2; Sec. 5, Th, 2-3; Sec. 6, Th, 3-4.

Structure, physiology, nutrition, and genetics of animals, with special reference to domesticated livestock and poultry. Required of all animal-production majors. Course 51A is prerequisite to 51B.

ANIMAL HUSBANDRY

50. Principles of Animal Husbandry. (4) I and II. Mr. Howell, Mr. _____

Lectures, M W F, 8; laboratory: Sec. 1, M, 1-4; Sec. 2, W, 1-4; Sec. 3, F, 1-4.

Principles and practices of livestock production. The selection of market classes and breeds of beef cattle, dairy cattle, sheep, hogs, and horses.

52. Feeds and Feeding. (3) II. Mr. Howell
Lectures, M W F, 10.
Prerequisites: Animal Biology 51A-51B or taken concurrently.
Composition and use of feedstuffs.

56. Horse Production. (2) II. Mr. Howell
Lecture, Tu, 9; laboratory, F, 1-4.
Prerequisites: Animal Husbandry 50 and 53.
Breeding, feeding, and management of horses.

58. Milk Production. (2) II. Mr. Mead, Mr. Ralston
Lecture, F, 8; laboratory, F, 1-4.
Prerequisites: Animal Husbandry 50 and 53.
Breeding, feeding, and management of dairy cattle.

61. Swine Production. (2) I. Mr. Hughes
Lecture, Th, 8; laboratory, Th, 1-4.
Prerequisites: Animal Husbandry 50 and 53.
Selection, breeding, feeding, and management of hogs.

63. Beef Cattle Production. (2) I. Mr. Guilbert
Lecture, Tu, 8; laboratory, Tu, 1-4.
Prerequisites: Animal Husbandry 50 and 53.
Selection, breeding, feeding, and management of beef cattle.

64. Sheep Production. (2) II. Mr. Miller
Lecture, M, 9; laboratory, M, 1-4.
Prerequisites: Animal Husbandry 50 and 53.
Selection, breeding, feeding, and management of sheep.

BACTERIOLOGY

61. Elementary Bacteriology. (2) I. Mr. Mudge
Lecture-demonstration, W F, 10.
Nature, occurrence, growth and death of bacteria; relations of micro-organisms to agriculture.

BOTANY

50. Elementary Botany. (3) I and II. Mr. Currier, Mr. Robbins
Lecture, M W F, Sec. 1, 9; Sec. 2, 11.
Principles underlying the growth and reproduction of plants, including structure and function.

51. **Weed Control.** (2) I. Mr. Harvey, Mr. Robbins
Lecture, Tu Th, 8; laboratory, Tu, 1-4.
Prerequisite: Botany 50, or equivalent, and the permission of the instructor.
Weed characteristics and identification; principles and methods of weed control; laws and regulations.
60. **Botany Laboratory.** (2) I and II. Mr. Currier, ——
Sec. 1, W, 1-4; Sec. 2, S, 9-12.
Offered concurrently with or following Botany 50, to satisfy the University matriculation requirement in science. Laboratory exercises designed to illustrate botanical principles.

CHEMISTRY

50. **Elementary Chemistry.** (3) I and II. Mr. Volman, ——
Lecture, M W, 11; laboratory and quiz: Sec. 1, M, 1-4; Sec. 2, Tu, 1-4; Sec. 3, W, 1-4; Sec. 4, Th, 1-4; Sec. 5, F, 1-4; Sec. 6, S, 9-12.

DAIRY INDUSTRY

50. **Elements of Dairying.** (3) I and II. Mr. Phillips
Lecture, Tu Th, 9; laboratory, M, 1-4.
Dairy Industry 50 is prerequisite to all other dairy industry courses.
Composition, properties, care, and handling of milk; the Babcock and acidity tests; cream separators.
51. **Cheesemaking.** (3) I. Mr. Phillips
Lecture, Tu, 11; laboratory, Th, 10-4.
Manufacture of the various types of cheese; preparation and care of starters; manufacture of casein.
52. **Buttermaking.** (3) II. Mr. Abbott
Lecture, M W, 10; laboratory, M, 1-4.
Creamery buttermaking; standardization of acidity; pasteurizing and churning the cream.
53. **Ice-Cream Making.** (3) I. ——
Lecture, W F, 8; laboratory, Sec. 1, W, 1-4; Sec. 2, F, 1-4.
Prerequisite: Agricultural Engineering 57; may be taken concurrently.
Care, preparation, and ingredients used in manufacturing ice cream; freezing, hardening, and storing; condensing of skim milk for ice-cream manufacture.
54. **Market Milk.** (3) II. Mr. Roadhouse
Lecture, Tu Th, 10; laboratory: Sec. 1, W, 1-4; Sec. 2, F, 1-4.
Conditions affecting the quality of milk; different grades of milk; pasteurization, standardization, and bottling; tests for quality and adulteration; inspection of dairies and milk plants.

60. Creamery Practice. (2-3) I and II. Mr. ———, Mr. Crouch
Discussion section, I: M, 8; II: F, 10; laboratory units and hours to be arranged.

Prerequisite: Dairy Industry 54, 51.

Practice in various departments of the creamery laboratory.

58. Dairy Plant Management. (4) II. Mr. ———

Lecture, M W, 9; laboratory, Th, 1-4, and three hours to be arranged.

Prerequisite: Dairy Industry 54 and 51.

Organization, operation and management of manufacturing plants; the keeping of creamery records.

ENTOMOLOGY AND PARASITOLOGY

51. Entomological Practice. (3) I. Mr. Bohart

Lecture, M W, 8; laboratory: Sec. 1, M, 1-4; Sec. 2, F, 1-4.

Identification, life histories, habits, and control of injurious insects. Supervised field excursions.

52. Beekeeping. (3) II. Mr. Eckert

Lecture, M W, 8; laboratory, W, 1-4.

Anatomy, life history, and habits of the honeybee; apparatus used in modern beekeeping; practice in handling bees.

60. Advanced Entomology. (2-4) I and II. Mr. Bailey and Staff

Hours by arrangement.

Special problems in entomology. Open only to advanced students of good scholastic standing.

Special emphasis is placed upon quarantined insects and regulatory work, insecticide laws, and such phases of the subject as will prepare students for border and county inspection work.

GEOLOGY

50. General Geology. (3) II. Mr. Gilbert

Lectures, M W, 10; one additional hour to be arranged.

Prerequisite: one year of high school chemistry, or Chemistry 50 and the consent of the instructor.

Minerals and rocks; weathering and erosion of rocks; study of sub-surface water, volcanoes, earthquakes, and mountain-building movements.

HISTORY

54A-54B. History of Western Europe. (3-3) Yr. Mr. Puryear

Tu Th, 8.

The growth of western European civilization from ancient times to the present.

54A is not prerequisite to 54B. A weekly discussion hour is to be arranged.

57A-57B. History and Institutions of the United States. (2-2) Yr.

M W F, 11.

Mr. Shideler

57A is not prerequisite to 57B.

The third hour each week is for study and discussion.

The completion of *either* 57A or 57B and passing a special examination on the United States Constitution will satisfy the graduation requirement of American History and Institutions of the Two-Year Curricula.

58A-58B. History of the Americas. (3-3) Yr.

Mr. Shideler

M W F, 8.

An introductory course in the history of the Western Hemisphere from the discovery to the present.

58A is not prerequisite to 58B.

HORTICULTURE**50. Fruit Growing. (3) I and II.**

Mr. Hansen, Mr. Philp

Lecture, M W F, 10.

Prerequisite: Botany 50, which may be taken concurrently.

Principles of fruit growing, with special reference to California conditions.

52. Plant Propagation. (2) II.

Mr. Hansen

Lecture, M, 9; laboratory: Sec. 1, M, 1-4.

Prerequisite: Botany 50.

Plant propagation, with special emphasis on fruit plants.

53. Orchard Operations. (2) I.

Mr. Philp, Mr. Hansen

Lecture, Tu, 9; laboratory: Sec. 1, W, 1-4.

Prerequisite: Horticulture 50, which may be taken concurrently.

Lectures and field practice with laying out and planting orchards, selection of orchard locations, pruning, spraying, and orchard management.

54. Orchard Operations. (2) II.

Mr. Philp

Lecture, W, 8; laboratory: Sec. 1, W, 1-4.

Prerequisite: Horticulture 50, which may be taken concurrently.

Lectures and field practice with pollination, spraying, thinning, and orchard management.

55. Orchard Operations. (3).

Mr. Philp, Mr. Hansen

Six-weeks' summer course, beginning August 3, 1946.

Hours to be arranged.

Prerequisite: Horticulture 50 and 53 or 54.

Fruit harvesting, packing, variety study, and standardization.

- 59. Citrus and other Subtropical Fruits. (3) I.** Mr. Claypool
Lecture, M W F, 10.
Prerequisite: Horticulture 50.
The subtropical fruit industry, including avocados and dates, with special emphasis on citrus.
- 61. Viticulture. (3) I.** Mr. Jacob
Lecture, Tu Th, 10; laboratory, Tu, 1-4.
Prerequisite: Horticulture 50 or consent of instructor.
Climate in relation to grape-production; history and distribution of grape growing; grape development and ripening; the principal varieties, harvesting, packing, and marketing table grapes; drying raisins.
- 62. Vineyard Operations. (3) II.** Mr. Jacob
Lecture, Tu Th, 10; laboratory, Tu, 1-4.
Prerequisite: Horticulture 50 or consent of the instructor.
Cultural operations in establishing and maintaining vineyards; planting; training; pruning; cultivation and irrigation; thinning and girdling; insect and disease pests; vineyard management.
- 63. Enology. (3) I.** Mr. Amerine, Mr. Castor
Lecture, W, 1; laboratory, W, 2-5, and three hours to be arranged.
Prerequisite: Chemistry 50, or equivalent; Bacteriology 61 and Horticulture 61, which may be taken concurrently.
Identification of wine-grape varieties. Wine production is influenced by the variety of grape and the type of wine desired; wine analysis; plant design and operation.
- 64. Enology. (3) II.** Mr. Amerine
Lecture, W F, 9; laboratory, F, 1-4 and one lecture hour to be arranged.
Prerequisite: Horticulture 63 or consent of instructor.
Influence of environment and variety on the wines produced; wine types; tasting and scoring; diseases and their control.
- 70. Enology Practice. (2) I and II.** Mr. Amerine
Six hours' laboratory to be arranged. May be repeated once for credit.
Prerequisite: Horticulture 63 and 64, which may be taken concurrently.
Practice in winery operation and laboratory control.

IRRIGATION

- 51. Plane Surveying. (3) I.** Mr. Brown
Lectures, Tu Th, 9; laboratory, Th, 1-4.
Prerequisite: plane trigonometry and consent of instructor.
Principles; field practice; calculations and mapping with special reference to irrigation, drainage, and agricultural engineering problems.

- 53. Irrigation Practice. (3) I.** Mr. Brown
Lecture, Tu Th, 11; laboratory: Sec. 1, M, 1-4; Sec. 2, Tu, 1-4.
Prerequisite: Mathematics 50.
Soil moisture in relation to irrigation practice; water requirements of crops; preparation of land; design of farm ditches and pipe lines; measurements of water; development of farm water supplies; selection and operation of pumping plants.

LANDSCAPE GARDENING

- 50. Landscape Gardening. (4) I and II.** Mr. Stahl
Lecture, Tu Th, 9; two 3-hour laboratory periods to be arranged.
Prerequisite to all other courses in landscape gardening.
Study of ornamentals; lawn making; plans for home grounds; a brief history of landscape art.
- 51. Plant Materials. (2) I.** Mr. Stahl
Lecture Tu Th, 10.
Fall flowering trees and shrubs; plans for private and service areas.
- 53. Nursery Practice. (2) I.** Mr. Stahl, Mr. Calmette
Lecture, Th, 1-2; laboratory, Th, 2-5.
Growing and care of ornamental plants in seed beds, cold frames, lath houses, and nurseries.
- 54. Nursery Practice. (2) II.** Mr. Stahl, Mr. Calmette
Lecture, Th, 1-2; laboratory, Th, 2-5.
Propagation and pruning of ornamental trees and shrubs; tree digging, balling, canning; general nursery care; field trips.
- 55. Floriculture. (2) I.** Mr. Stahl, Mr. Calmette
Lecture, Tu, 1-2; laboratory, Tu, 2-5.
Commercial greenhouse, lath house, and garden culture of foliage and flowering plants. Study of annuals, herbaceous perennials, bulbs and bedding plants.
- 56. Floriculture. (2) II.** Mr. Stahl, Mr. Calmette
Lecture, Tu, 1-2; laboratory, Tu, 2-5.
Greenhouse management and other problems related to floriculture practices.
- 60. Advanced Landscape Gardening. (2-6) I, II.** Mr. Stahl, Mr. Calmette
Hours by arrangement.
Prerequisite: consent of the instructor.
Open only to students who have completed the first year's work with high scholastic standing.

LANGUAGES AND LITERATURE

ENGLISH

50. Effective Writing. (3) I and II. Mr. Fishman, Mrs. Sikes, ———
 I: M W F, Sec. 1, 8; Sec. 2, 10; Sec. 3, 11. II: M W F, Sec. 1, 8; Sec. 2, 9;
 Sec. 3, 10.
 Effective reading, studying, and note-taking; dictionary use, grammar,
 spelling, and punctuation; sentence and paragraph construction; some
 business writing.

***60. Composition.** (3) I and II. ———, ———

M W F, 11.

Prerequisite: English 50.

The planning and writing of papers, with some reading.

70. Introduction to Literature. (2-3) I and II. ———

Tu Th, 10.

Prerequisite: English 50 or Subject A.

Class analysis of selected literature. This course may be repeated once
 for credit.

FRENCH

51. Elementary French. (4) I. Mr. Nelson

M Tu W Th F, 11.

Prerequisite: two years of high school French.

GERMAN

52. Elementary German. (4) II. Mr. Fishman

M Tu W Th F, 10.

Prerequisite: two years of high school German.

PUBLIC SPEAKING

50. Elements of Public Speaking. (3) I and II. Mr. Fishman, Mrs. Wright

I: M W F, 9. II: M W F, Sec. 1, 8; Sec. 2, 9.

Prerequisite: English 50 or Subject A.

***60. Principles and Types of Speech.** (3) I and II. Mr. Fishman

M W F, 9.

Prerequisite: Public Speaking 50.

SPANISH

50A. Elementary Spanish. (3) I and II. ———

M Tu W Th, 9.

This course corresponds to the first year of high school Spanish.

* Not to be given, 1946-1947.

50B. Elementary Spanish. (3) II. _____

M Tu W Th, 9.

Prerequisite: course 50A or one year of high school Spanish.

52. Spanish. (4) II. Mr. Nelson

M Tu W Th F, 11.

Prerequisite: courses 50A-50B or two years of high school Spanish.

MATHEMATICS AND PHYSICS**A. Algebra. (3)* I.**

Mr. G. A. Baker, Mr. Roessler, _____

Tu Th S, 8, 10.

For students without credit for high school algebra.

Fundamental principles and formulas; simple equations with illustrative applications.

B. Geometry and Computation. (3)* II. _____

Tu Th S, 8, 10.

For students without credit for high school geometry.

Fundamental propositions of geometry, with simple applications; trigonometric functions; logarithms, significant figures.

50. Agricultural Mathematics. (3) I and II.

M W F, 8, 10.

Mr. Burdette, Mr. Roessler, _____

Solving the various problems commonly met in agriculture and related vocations.

60. Intermediate Algebra. (3) I and II.

Mr. G. A. Baker, Mr. Burdette, _____

Tu Th S, 8; M Tu W Th F, 9, 11.

Prerequisite: one year of high school algebra. One and one-half years of high school algebra is advised. Students who need extra drill will attend the section which meets five days a week. Not open to students who have received credit for two years of high school algebra, or course 3A, or 8 given at Berkeley.

70. Trigonometry. (3) I and II.

Mr. G. A. Baker, Mr. Patten, _____

M W F, 10, 11.

Prerequisite: plane geometry; one and one-half years of high school algebra or course 60.

Course 70 includes plane trigonometry and spherical right triangles.

82. General Physics. (4) II. _____

Lectures, M W F, 10; laboratory: Sec. 1, M, 1-4; Sec. 2, Tu, 1-4.

Elementary mechanics, heat, electricity, sound, and light.

* Credit in Veterans' Training Programs only.

MILITARY SCIENCE

5-6. Basic Infantry Training (first year). (2-2). _____

Drill, Tu Th, 11-12; theory, two hours to be arranged.

Organization, infantry drill, national defense act, obligations of citizenship, military history and policy, current international situation, military courtesy, map reading, rifle marksmanship.

7-8. Basic Infantry Training (second year). (2-2). _____

Drill, Tu Th, 11-12; theory, two hours to be arranged.

Duties of noncommissioned officers, military history, infantry weapons, musketry, scouting and patrolling, combat principles.

100A-100B. Advanced Infantry Training (third year). (3-3). _____

Drill, Tu Th, 11-12; theory, three hours to be arranged.

Open to all students who have completed Military 8 and to veterans of one or more years' service.

Duties of noncommissioned and commissioned officers, military history, infantry weapons, scouting and patrolling, combat principles, and administrative duties, as pertain to commissioned officers.

MUSIC

Band and Orchestra.

Mr. Gittinger

Band, chorus, and orchestra are noncredit extracurricular activities open to all interested and qualified students.

Students enrolled in Military Science 5-6 and 7-8 may satisfy a part of the Tuesday and Thursday drill requirements by playing in the military band. Students not enrolled in these courses may receive credit for military band by enrolling in Military Science 109, which may be repeated for credit each semester.

PHYSICAL EDUCATION

*Men***1. Physical Training, Recreation, and Competitive Sports. ($\frac{1}{2}$ - $\frac{1}{2}$) Yr.**

Mr. Toomey, Mr. E. S. Wilson, Mr. Schall, Mr. Hickey, Mr. Stromgren
Sections meet twice weekly at hours to be arranged.

Students may enroll for physical education as an elective course. Sections are organized in baseball, basketball, boxing, football, golf, riding, soccer, tennis, touch-football, track, wrestling, swimming and water sports. Men qualified for athletics may enroll in any sport pursued at Davis, such as football, basketball, etc., and receive credit for this elective.

33. First Aid. ($\frac{1}{2}$) I and II.

The Staff

2 hours weekly.

The standard and advanced courses are combined. Upon successful completion, the Red Cross Certificate is awarded. Fee, \$1, including textbook. Fifty cents without textbook.

*Women***26. Physical Education. ($\frac{1}{2}$) I and II.**

Two 1-hour periods a week by arrangement.

Sections in archery, badminton, volleyball, riding, swimming, life-saving, swimming formations.

33. First Aid. ($\frac{1}{2}$) I and II.

The Staff

2 hours weekly.

The standard and advanced courses are combined. Upon successful completion, the Red Cross Certificate is awarded. Fee, \$1, including textbook. Fifty cents without textbook.

PLANT PATHOLOGY**52. Plant Diseases. (3) II.**

Mr. Hewitt

Lecture, Tu, 9; laboratory, M W, 10-12.

Prerequisite: Botany 50.

Identification, cause, and control of plant diseases important to California agriculture.

POULTRY HUSBANDRY**51. Elementary Poultry Production. (3) I.**

Mr. Lorenz, Mr. Kratzer

Lecture, Tu Th, 8; laboratory, Tu, 1-4.

Poultry breeds and their uses, incubation, brooding, rearing, and housing; flock management and culling; production, grading, handling, and preparation of poultry and eggs for market.

52. Principles of Poultry Husbandry. (3) II.

Mr. Lorenz, Mr. Kratzer

Lecture, Tu Th, 9; laboratory, Tu, 1-4.

Prerequisite: Animal Biology 51A, and 51B, which may be taken concurrently, and Mathematics 50.

Anatomy, physiology, and reproduction; importance of diseases and sanitation; nutrition and feeding; breeding and selection.

53. Incubation and Brooding Practice. (3) I.

Prerequisite: Poultry Husbandry 51 taken earlier or concurrently.

One 1-hour conference period a week and practice daily, including Sunday, for nine weeks, 7:30-8:00 A.M., 12:00 M. to 12:15 P.M., 4:00-5:00 P.M.

Operation of incubators, brooding of chicks, and keeping of detailed records. Intended primarily for students who desire additional practical experience.

54. Pen Practice. (2) II.

Prerequisite: Poultry Husbandry 52 taken earlier or concurrently.

One 1-hour conference period a week and practice daily, including Sunday, for six weeks, 7:30-8:00 A.M., 12:00 M to 12:15 P.M., 4:00-5:00 P.M.

Management of laying hens; the keeping of accurate records. Intended primarily for students who desire additional practical experience.

55. Utility Poultry Breeding. (2) I.

Mr. Asmundson

Lecture, M W, 8.

Prerequisite: Poultry Husbandry 51 and 52, taken earlier or concurrently.

The principles and practice of breeding poultry for egg and meat production.

56. Turkey Production. (2) II.

Mr. Asmundson

Lecture, Tu Th, 10.

Prerequisite: Poultry Husbandry 51 and 52.

Breeds and breeding, incubation, brooding, rearing, nutrition, housing, marketing, and sanitation.

57. Poultry Nutrition. (2) I.

Mr. Kratzer

Lecture, M W, 9.

Prerequisite: Poultry Husbandry 52, Chemistry 50, Animal Biology 51A-51B.

Principles of poultry nutrition; poultry feeds and rations.

58. Special Problems. (1-2) I and II. The Staff, Mr. Asmundson in charge
By arrangement.

Prerequisite: Poultry Husbandry 51 and 52 completed or taken concurrently, and consent of the instructor.

PSYCHOLOGY

52. General Psychology. (3) II.

M W F, 8.

Prerequisite: consent of the instructor.

An introduction to the facts and principles of psychology.

SOIL SCIENCE

52. Soils. (3) II.

Mr. Cole

Lecture, Tu Th, 8; laboratory: Sec. 1, Tu, 1-4; Sec. 2, W, 1-4; Sec. 3, Th, 1-4.

Prerequisite: Mathematics 50.

Origin, formation, texture, and structure of the soil; control of soil-moisture relations, problems of alkali; effects of drainage, irrigation, crop rotations, fertilizers, and amendments; crop adaptations; erosion, soil management.

TRUCK CROPS

- 51. Truck Crops. (3) I.** Mr. O. A. Lorenz, Mr. Knott
Lecture, Tu Th, 8; laboratory: Tu, 1-4.
Growing and marketing of the important vegetable crops.
- 52. Vegetable Improvement. (3) II.** Mr. G. N. Davis
Lecture, Tu Th, 11; laboratory, Tu, 1-4.
Prerequisite: Botany 50, and Truck Crops 50, or Agronomy 50, or Landscape Gardening 50, or Horticulture 50.
Improvement of vegetables; seed harvesting, curing and storing, hybridization and selection.
- 53. Vegetable Varieties. (3) I.** Mr. P. G. Smith
Lecture, Th, 1; laboratory, Th, 2-5, S, 9-12.
Prerequisite: Truck Crops 50.
Classification, identification, origin, history, types, and uses of vegetable crop plants; inspection and standardization. Two Saturday field trips at a total cost of about \$7.50.
- 54. Advanced Truck Crops. (2-4) II.** The Staff
Hours by arrangement.
Open only to advanced students of good scholastic standing.

VETERINARY SCIENCE

- 51. Animal Hygiene. (2) I.** _____
Lecture, Tu Th, 9.
Prerequisite: Animal Biology 51A-51B.
Disease control among farm livestock, including poultry; intelligent co-operation with the veterinarian and with official agencies.

VITICULTURE—(See Horticulture)

POSTMASTER: *Return within five days to the University of California, Berkeley 4, California. Return postage guaranteed.*
