

UNIV. OF

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—

GENERAL

CATALOGUE

1953 - 54

DAVIS

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UNIVERSITY OF CALIFORNIA

# Bulletin

## General Catalogue

**DAVIS CAMPUS**

Fall and Spring Semesters

1953-1954

JULY 15, 1953

**Price, Fifteen Cents**

**DAVIS, CALIFORNIA**

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*All announcements herein are subject to revision. Changes in the list of Officers of Administration and Instruction may be made subsequent to the date of publication, July 15, 1953*

# GENERAL CATALOGUE

DAVIS CAMPUS

# General Catalogue

DAVIS CAMPUS

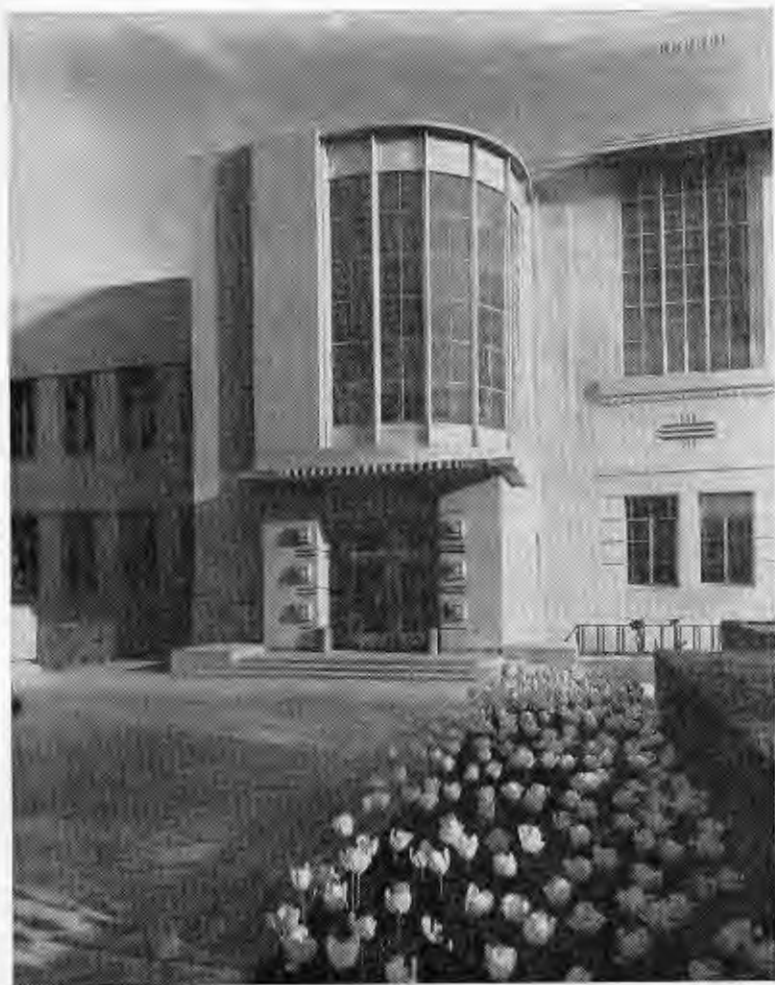
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UNIVERSITY OF CALIFORNIA

DAVIS



Entrance to administrative section of  
Library-Administration Building

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# CALENDAR, 1953-1954\*

## DAVIS CAMPUS

### First Summer Session

June 22, Monday Registration and first day of instruction.  
July 4, Saturday Independence Day—academic and administrative holiday.  
Aug. 1, Saturday First Summer Session instruction ends.

### Special Summer Session for Agriculture

July 13, Monday Registration and first day of instruction.  
August 21, Saturday Special Summer Session instruction ends.

### Second Summer Session

Aug. 8, Monday Registration and first day of instruction.  
Sept. 7, Monday Labor Day—academic and administrative holiday.  
Sept. 12, Saturday Second Summer Session instruction ends.

### Fall Semester

Sept. 14, Monday Fall semester begins.  
Sept. 17, Thursday }  
Sept. 18, Friday } Registration.  
Sept. 21, Monday Instruction begins.  
Nov. 26, Thursday Thanksgiving Day—academic and administrative holiday.  
Dec. 21, Monday Christmas recess starts—academic holiday.  
Dec. 24, Thursday }  
Dec. 25, Friday } Christmas holidays—administrative.  
Dec. 31, Thursday }  
Jan. 1, Friday } New Year's holidays—administrative.  
Jan. 2, Saturday Christmas recess ends.  
Jan. 4, Monday Instruction resumes.  
Jan. 16, Saturday Instruction ends.  
Jan. 18, Monday, to }  
Jan. 26, Tuesday } Final examinations.  
Jan. 28, Thursday Fall semester ends.

### Spring Semester

Feb. 8, Monday Spring semester begins.  
Feb. 12, Friday Registration.  
Feb. 15, Monday Instruction begins.  
Feb. 22, Monday Washington's Birthday—academic and administrative holiday.  
April 26, Monday, to }  
May 1, Saturday } Spring recess.  
May 31, Monday Memorial Day—academic and administrative holiday.  
June 5, Saturday Instruction ends.  
June 7, Monday, to }  
June 14, Monday } Final examinations.  
June 17, Thursday Spring semester ends.

\* For complete calendar, refer to University Calendar prepared by the Registrar each semester and issued at registration.

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804 Mechanics' Institute bldg,  
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203 Administration bldg, Los Angeles 24

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555 S Flower st, Los Angeles 17
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12
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\* Absent on leave.

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105 University Hospital, San Francisco 22

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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. It occupies eight different campuses throughout the State, namely: Berkeley, Davis, La Jolla, Los Angeles, Mount Hamilton, Riverside, San Francisco, and Santa Barbara.

## ADMINISTRATION

The Regents of the University of California, through 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 has general supervision of the discipline of students and recommends to the Regents all candidates for degrees. The dean or director of a school, college, or other division of the University has 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.

## CURRICULA AT DAVIS

Instruction is offered in (a) the College of Agriculture; (b) the College of Letters and Science; (c) the College of Engineering (Agricultural Engineering); (d) the School of Veterinary Medicine; and (e) a unit of the Graduate Division, Northern Section.

Curricula of four years in applied science in the College of Agriculture leads to the bachelor's degree in science (B.S.). The curricula include major subject offerings in: agricultural economics, agricultural education, agronomy, animal husbandry, dairy industry, enology, entomology and parasitology, food technology, general agriculture, genetics (animal science), genetics (plant science), home economics, irrigation science, landscape management, plant pathology, pomology, poultry husbandry, preforestry, preveterinary medicine, range management, soil science, vegetable crops, and viticulture.

The undergraduate curricula of four years in the College of Letters and Science lead to the bachelor's degree in arts (A.B.). Organized majors and professional curricula include American civilization, botany, chemistry, economics, English, French, German, history, mathematics, medical sciences, microbiology, physical science, physics, political science, premedical, Spanish, and zoölogy. Students who complete successfully the first two years in this College will qualify for the degree of Associate in Arts.

All courses required by the Colleges of Engineering in the first and second years of the Agricultural Engineering curriculum are offered on the Davis campus. The third year must be spent under the Colleges of Engineering on either the Berkeley or Los Angeles campus. The fourth year the student will return to the Davis campus.

The School of Veterinary Medicine offers a curriculum of four years, based upon two or more years of pre-professional work, and leading to the degree of Doctor of Veterinary Medicine (D.V.M.).

Graduate study, leading to advanced degrees, is offered to college graduates formally admitted to the Graduate School.

### SUMMER SESSIONS

In addition to the regular programs of instruction on the several campuses during the fall and spring semesters, the University also conducts one or more general sessions during the summer months. In 1953 there are two such summer sessions beginning on June 22 and on August 3. On the Davis campus qualified students may pursue the courses for advanced undergraduates numbered 199 and the graduate research courses numbered in the 200 series offered by the College of Agriculture and the School of Veterinary Medicine. A special Summer Session is also offered during the period July 13 to August 21 for teachers of vocational agriculture. At present the College of Letters and Science does not offer courses during the summer. Summer sessions are also conducted on the Berkeley, Los Angeles, and Santa Barbara campuses. Information about the Summer Sessions is available in the *Summer Sessions* bulletin, obtainable from the Registrar, or from the Office of the Summer Sessions, University of California, Berkeley 4.

### UNIVERSITY EXTENSION

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

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

Five principal methods of instruction are used by University Extension:

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

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

(3) Conferences and special activities, for periods ranging from two days to several weeks, provide intensive familiarization courses for interested groups.

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

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

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

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

\* For information concerning admission to the University through University Extension, see page 23.

**UNIVERSITY LIBRARY**

The University Library on the Davis campus, occupying much of the Library-Administration Building, contains about 90,000 books and receives annually about 3,000 current periodicals and serials. These have been selected to support the teaching and research needs of the College of Agriculture, the College of Letters and Science, and the School of Veterinary Medicine. The collection of works in agriculture and related fields is among the largest in the West. As an intelligence center for printed materials, the main library serves both students and faculty. It is supplemented by several specialized departmental collections which are primarily for laboratory or office use. Research materials not available in Davis are borrowed elsewhere through a nation-wide inter-library loan service. Trained reference librarians are available for information and advice on a 77-hour-a-week basis.

For further information students are referred to a pamphlet, *The Library: For Use and Enjoyment*, copies of which are available at the Library.

# 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. Formal application must be filed with the Registrar, University of California, Davis. Application blanks will be supplied upon request. The application should be filed during the semester preceding that for which the applicant wishes to register and must be filed not later than August 15 for the fall semester or January 15 for the spring semester.

Every applicant for admission pays 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.

Every new student, and every student returning to the University after an absence, must present at the time of medical examination by the University Medical Examiners a certificate establishing the fact that he has been successfully vaccinated against smallpox within seven years. Vaccination should be completed prior to registration. A form for this purpose will be furnished by the University.

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

## ADMISSION IN FRESHMAN STANDING

An applicant who has attended a junior college, four-year college, university, extension classes of college level, or any comparable institution since graduating from high school is subject to regulations governing admission in advanced standing (see below). Such college attendance may not be disregarded, whether or not any courses were completed.

### Admission on the Basis of the High School Record

The applicant, having filed formal application as directed above, must have the secondary schools he has attended send to the Registrar complete transcripts of record of all studies undertaken in those schools. Such transcripts must show that the applicant has been graduated from an accredited\* high school. The Registrar will then evaluate the high school record, and the applicant will be eligible for admission if he qualifies under any one of the following methods. (There are additional requirements for out-of-state students. See below.)

\* An accredited high school in California is one that has been officially designated, by the Board of Regents of the University, as a school from which students will be admitted to the University without examination on the basis of the high school record of subjects completed and scholarship attained. The list of accredited schools is published by the University annually. Accreditation by the University refers to the college preparatory function of the high school and implies no judgment regarding the other educational functions of the school. For information concerning the accrediting of schools, principals may communicate with the Office of Relations with Schools. For schools outside California, regional or other accrediting agencies are consulted; the University makes the final decision regarding acceptability. If the high school from which the applicant graduated is not accredited, the Registrar will, upon request, instruct the student regarding the procedure he should follow.

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

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

- (a) History .....1 unit. This requirement must be satisfied by 1 unit of United States history or 1 unit of United States history and civics.
- (b) English .....3 units. These may consist of any six semesters that give preparation in written and oral expression and in the reading and study of literature. Reading and study of contemporary literature may be included. The requirement in English must be satisfied by credit designated "English."
- (c) Mathematics .....2 units. These must consist of two semesters of elementary or advanced algebra, and two semesters of plane geometry, or solid geometry and trigonometry.
- (d) Laboratory 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 course  
chosen from one of  
the following .1 (or 2) units. (1) mathematics, a total of 1 unit (second-year algebra,  $\frac{1}{2}$  or 1 unit; solid geometry,  $\frac{1}{2}$  unit; trigonometry,  $\frac{1}{2}$  unit); (2) foreign language, either 1 additional unit in the same foreign language offered under (e), or 2 units of a different foreign language; (3) science, 1 unit of either chemistry or physics in addition to the science offered under (d) above.

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

3. Complete not less than 12 high school units of grade A or B in the work of the tenth, eleventh, and twelfth years; with not more than two units of subject deficiencies in the required list (a) to (f). (Grades earned in physical education, military science, R.O.T.C. and religion are *not* to be counted.)

4. Complete not less than 12 high school units with no grade lower than C in work taken in the tenth, eleventh, and twelfth years, exclusive of grades earned in religion, physical education, military science, and E.O.T.C.; with 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 or social science of which one must be United States History

5. Experimental Plan applicable September, 1953, through September, 1959. University authorities believe that high school students who follow the regular (a) to (f) pattern of subjects outlined above, together with the additional subjects recommended for particular majors will be well prepared for work in the University. However, the University does not wish to exclude a student who has followed a program of University preparatory studies recommended to him by his high school and will therefore admit an applicant on a grade-B average scholarship in a different program of University preparatory studies, provided such a program has been previously filed with and approved by the Board of Admissions and Relations with Schools. For the experimental plan in agriculture refer to the section, "Preparation for Curricula in Agriculture below.

6. In addition to the foregoing methods, the Board of Admissions and Relations with Schools authorizes from time to time experimental programs to test the validity of suggested procedures. Information about these programs is communicated promptly to school authorities in California by the Director of Relations with Schools. Also, the Registrar is charged by the Board with the authority and responsibility for waiving minor deficiencies when justification is evident in the form of unusual academic recommendations or transcripts.

### **Responsibility of High School Authorities**

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

### **Preparation for University Curricula**

In addition to those subjects required for admission each University curriculum involves certain preparatory subjects, which, if included in the high school program, will give a more adequate background for the student's chosen field of study. In some cases lack of a recommended high school course will delay entrance to certain University courses and postpone graduation from the University. Details of these recommendations will be found in the circular on **PREREQUISITES AND RECOMMENDED SUBJECTS** which may be obtained from the Registrar, University of California, Davis, or from the Assistant Director of Relations with Schools.

Both physics and chemistry, recommended as preparation for many curricula in the University, will, if completed in high school, meet part of the subject requirements for the degree of Associate in Arts in the College of Letters and



Science, and thereby give the student greater opportunity to choose elective subjects during his freshman and sophomore years.

The high school student should use special care in selecting a foreign language. Not only is the study of language a valuable part of a general education; a reading knowledge of some foreign language is very useful for advanced work in many departments. High school Latin 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.

### Preparation for Curricula in Agriculture

It is recommended that students entering the College of Agriculture complete as a part of or in addition to those subjects required for admission, the following subjects in high school: intermediate algebra, 1 unit, or intermediate algebra,  $\frac{1}{2}$  unit, and trigonometry,  $\frac{1}{2}$  unit; physics, 1 unit; and/or chemistry, 1 unit. Students proposing to major in irrigation science, or agricultural engineering should have in addition 1 unit of mechanical drawing. Failure to take the proper subjects in high school may delay completion of the University course beyond the usual four-year period.

To assist students in making out a high school schedule, there have been arranged below a number of programs of high school courses that will admit them to the University of California College of Agriculture.

1. Program covering the requirements for admission to the College of Agriculture—an "ideal" program for success in either college:

Scholarship requirement: a "B" average in seven of the 9½ units starred (\*).

<i>1st year</i>	<i>2nd year</i>	<i>3rd year</i>	<i>4th year</i>
English	English*	English*	English or Speech*
Algebra	Geometry*	United States history and civics*	Physics*
Foreign language	Foreign language*	Algebra*	Elective (Trigo- nometry)*
Elective	Elective	Chemistry*	Elective

This program would limit high school agriculture to three years, unless agriculture is carried as a fifth subject.

2. Minimum program:

Scholarship requirement: a "B" average in courses starred (\*). See Agricultural Experimental Plan on page 21.

<i>1st year</i>	<i>2nd year</i>	<i>3rd year</i>	<i>4th year</i>
English	English*	English*	Elective (English)
Algebra	Geometry*	United States history and civics*	Chemistry*
Agriculture or Home Economics	Agriculture or Home Economics	Intermediate algebra*	Elective (Trigonometry)
Elective	Elective	Agriculture or Home Economics	

This program would allow for four full years of agriculture or home economics in high school, but limits electives in other fields.

### 3. Program covering the most desirable requirements but omitting foreign language:

Scholarship requirement: "A" or "B" grades in 12 units taken in the 10th, 11th, and 12th years.

1st year	2nd year	3rd year	4th year
English	English	English	United States history and civics
Algebra	Geometry	Algebra	Elective (Trigonometry)*
	Elective	Chemistry	Physics
Elective	Elective	Elective	Elective

Four years of high school agriculture could be taken in this program.

### 4. Program omitting foreign language, with high scholarship required in selected 11th and 12th grade courses:

Scholarship requirement: "A" or "B" grades in six of the units starred (\*).

1st year	2nd year	3rd year	4th year
English	English	English*	English*
Algebra	Geometry	Algebra*	United States history and civics*
	Elective	Chemistry*	Physics*
Elective	Elective	Elective	Trigonometry*

#### AGRICULTURAL EXPERIMENTAL PLAN (Applicable September, 1952, through September, 1958)

Applicants for admission to the College of Agriculture will be admitted on a program in which additional science and/or mathematics, or two years' credit with A or B grades in high school agriculture or home economics, may be substituted for the foreign language requirement. Under this plan, A grades received in agriculture or home economics may not be used to balance C grades in other required subjects. A student admitted under this plan must realize that if after registration in the College of Agriculture he wishes to transfer to another college of the University, he must meet the admission requirements of that college.

#### Preparation for Curricula in Engineering

The prospective student in engineering will be seriously handicapped if he fails to include in his high school program certain subjects in addition to the general University requirements. Specifically, he should present the following total units: history, 1 unit; English, 3 units; algebra, 2 units; plane geometry, 1 unit; trigonometry,  $\frac{1}{2}$  unit; chemistry, 1 unit, or physics, 1 unit (both are desirable); foreign language, 2 units; mechanical drawing, 1 unit; and electives, 2 units. Without this preparation it will be impossible to complete the required curriculum in four years, because the student cannot register for certain freshman and sophomore courses to which matriculation subjects are prerequisite.

Laboratory courses in the various curricula of the Colleges of Engineering require manual skills in the operation and testing of machines and equipment. These courses are planned on the assumption that the student has had some

previous work which will develop the skills. Unsatisfactory laboratory performance which frequently results when such skills are absent can be traced to the fact that the student has had no prior manual training. It is therefore recommended that students wishing to enter the Colleges of Engineering elect shop courses in high school, especially machine shop, for at least one semester.

All applicants for admission to the Colleges of Engineering at either the freshman or junior level must take Qualifying Examinations. The *Engineering Examination Lower Division* is primarily an aptitude test, but presumes that the student has had the required subjects in high school, particularly those in mathematics through trigonometry, physics or chemistry, mechanical drawing, and English. No preparation beyond successful completion of the high school courses is required. The *Engineering Examination Upper Division* is based on the subject matter of the preengineering and engineering courses given in the first two years and presumes the completion of mathematics through integral calculus, general college chemistry, general college physics, descriptive geometry, English, and engineering drawing.

Out-of-state applicants are permitted to use the engineering examination both for the engineering requirement and for the nonresident examination requirement.

### Admission by Examination

(Applicable only to mature persons and to high school graduates)

Though the University does not offer entrance examinations, it accepts the results of examinations given by the Educational Testing Service for the College Entrance Examination Board. Information about dates and places of examination may be secured from the Educational Testing Service, P. O. Box 592, Princeton, New Jersey, or P. O. Box 9896, Los Feliz Station, Los Angeles 27, California. Definite arrangements to take the tests must be made at least four weeks prior to the date of the tests. If the applicant has completed all of the subjects in the (a) to (f) list above with grades of C or better, but is deficient in the scholarship average, he may clear his admission requirements by standard scores of 500 or above on the Scholastic Aptitude Test and on three achievement tests in subject fields. If he has not completed the (a) to (f) list of subjects with grades of C or better, he should consult the Registrar regarding the tests he must take. If his high school is unaccredited, he may offer an approved pattern of examinations concerning which he should consult the Registrar.

### Removal of Admission Deficiencies

Before admission is approved, deficiencies in high school scholarship or subject requirements must be removed by examination (see above) or by completing additional courses. If the applicant's only deficiency arises from not having studied a required subject, he may remove the deficiency by a satisfactory grade in an approved course. Meanwhile a satisfactory scholarship average must be maintained in other studies pursued.

If the deficiency is caused by a low scholarship average or by a combination of low scholarship and incomplete subject preparation, the applicant may remove his deficiencies as follows:

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

- (a) a minimum of 15 units of college transfer courses with a grade-point average of 1.5, or

- (b) 30 units or more of college transfer courses with a grade-point average of 1.3, or
- (c) a grade C average or higher on completion of all published requirements for junior standing in a college or school in the University.

Ordinarily, graduates of California high schools who are not eligible for admission to the University are advised to attend one of the California junior colleges and complete there the lower division requirements of the college in which they wish to register. (See 5 below and the section on "Admission in Advanced Standing.")

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

(a) *University Extension*: Both class and correspondence courses are offered by University Extension. At Berkeley and at Los Angeles special programs of class courses are offered for students attempting to remove admission deficiencies. Only those with five units or less of scholarship deficiencies in high school records are eligible for these programs. Other courses, class or correspondence, are not restricted, but the applicant should have all courses he undertakes approved in advance by the Registrar to insure that they will be acceptable. To make up deficiencies in scholarship, grades received in this program must be definitely above a C average and must serve, not merely as specific make-up of deficiencies, but also as a demonstration of ability to do college work successfully.

(b) *Combination Program in the College of Agriculture*: For high school graduates with not more than three subject deficiencies, among which may not be included algebra or geometry, a combination program is offered in the College of Agriculture at Davis.

(c) *Summer Session*: For students with only one or two deficiencies a six-week or an eight-week Summer Session of the University or of an approved university, college, or junior college, may be used to make up the shortages if the records are received in time for clearance. Summer Session programs should be approved in advance by the Registrar.

3. By College Entrance Examination Board Examinations (refer to section on "Admission by Examination," page 22).

4. By postgraduate courses in regular sessions at accredited high schools.

5. As an alternative to making up high school subject deficiencies, an applicant from a California junior college or state college may be admitted on the basis of a record showing completion of at least 60 units of C-average work, in which must be included all the subjects required for junior standing in a school or college of the University.

6. In addition to the foregoing methods, the Board of Admissions authorizes from time to time experimental programs to test the validity of suggested procedures. Information about these programs is communicated promptly to school authorities in California by the Director of Relations with Schools. Also the Director of Admissions is charged by the Board with the authority and responsibility for waiving minor deficiencies when justification is evident in the form of unusual academic transcripts of record or recommendations.

### ADMISSION IN ADVANCED STANDING

An applicant for admission to the University in advanced standing must present evidence that:

(1) He has satisfied, through either high school or college courses, the subjects required for admission of high school graduates in freshman standing.

(2) His advanced work, in institutions of college level, has met the minimum scholarship standard required of transferring students (namely an average of grade C or higher in all college courses undertaken, including at least a C average in the last institution attended).

(3) He is entitled to return as a student in good standing to the last college attended.

The college scholarship average required of an applicant whose high school scholarship is below the required standard is described in the section "Removal of Admission Deficiencies," below.

As an integral part of the system of public education of California, the University accepts at full value approved transfer courses completed with satisfactory grades in the public junior colleges of the State. Many students complete their advanced studies at the University after spending the first two years of their college career in one of the many excellent California public junior colleges.

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

No applicant may receive transfer credit in excess of an average of 18 units per semester. After a student has earned 70 units acceptable on a degree (except credit allowed on the basis of military service and training) no further unit credit will be granted for courses completed at a junior college.

Extension courses taken at some institution other than the University of California may not be acceptable; decision as to their acceptability rests with the Registrar. If such a program is planned to apply toward a degree at the University, the approval of the Registrar should be sought in advance.

### **Removal of Scholarship Deficiencies by Applicants from Other Colleges**

If an applicant otherwise eligible seeks to transfer from other institutions of collegiate rank, but his college record fails to show a satisfactory scholarship average, he may be admitted only when the deficiency has been removed by additional work completed with grades high enough to offset the shortage of grade points. This may be accomplished by work in other approved higher institutions, in Summer Sessions, or by correspondence courses in the University Extension. Applicants with scholarship deficiencies in college records are not usually accepted for the admissions program classes in Extension.

### **LIMITATION OF ENROLLMENT OF OUT-OF-STATE APPLICANTS**

It has been necessary to limit somewhat the enrollment of nonresidents of California; only those of exceptional promise will be eligible for admission. Besides the normal admission requirements described in the sections on "Admission on the Basis of the High School Record," page 17, and "Admission in Advanced Standing," page 23, the special regulations given below apply to nonresident applicants. Children of alumni of the University of California and residents of Hawaii are not subject to the special nonresident requirements for admission.

**LOWER DIVISION**

Applicants directly from high school or with less than 60 semester units of acceptable college credits may be admitted to the freshman or sophomore class if they meet the following out-of-state scholarship requirement and present a satisfactory score on one of the scholastic aptitude tests.

**1. Out-of-State Scholarship Requirement:****(a) High School:**

Grade-point average 2.3 or better in subjects required for admission, if taken in secondary schools accredited by a state university or a regional association. Grade-point average 2.5 in subjects required for admission, if taken in secondary schools accredited by other agencies.

**(b) Advanced Standing:**

A scholarship record of not less than 1.7 is required on any college work undertaken if the applicant is in advanced standing (has done college work) but presents less than 60 semester units of acceptable college credits (1 unit of A counts 3 grade points, 1 unit of B counts 2 grade points, 1 unit of C counts 1 grade point, D and F yield no grade points). An applicant who has completed less than 15 quarter or 12 semester units of college work must, in addition, meet the minimum high school scholarship as stated above.

**2. Out-of-State Examination.**—A properly certified record of standing must be presented on one of the following examinations:

**(a) College Entrance Examination Board Scholastic Aptitude Test.** Arrangements must be made through the Educational Testing Service, Box 592, Princeton, New Jersey, or Box 9896, Los Feliz Station, Los Angeles 27, California.

**(b) American Council on Education Psychological Examination—College Level.** Arrangements may be made either through the applicant's own school or through the Registrar. In applying to the Registrar, the applicant should submit the name and address of a responsible school official who has agreed to administer the examination. Arrangements to take the examination through the University should not be made until a formal Application for Admission to the University is on file.

**UPPER DIVISION**

Applicants who present 60 or more semester units of advanced standing credit, according to the evaluation by the Registrar, are admitted under regular rules (see "Admission in Advanced Standing" above) except that in addition to submitting the usual transcripts, they must also submit a score on the College Transfer Test. This examination is administered by the Educational Testing Service, Box 592, Princeton, New Jersey, or Box 9896, Los Feliz Station, Los Angeles 27, California.

**ADMISSION OF RETURNING MEMBERS OF THE ARMED FORCES**

Some exceptions in the subject requirements for admission will be made for men and women whose schooling has been appreciably delayed by service in the armed forces. Such exceptions will apply, however, only when the scholarship record is high enough to indicate probable success in the University. Veterans whose scholastic records are good, and who do not have more than 3 units of high school deficiencies, are encouraged to apply even though they may not have all the usual requirements. A veteran with a good scholarship record but subject deficiencies will be classified as a special student until deficiencies are removed, or until all requirements for junior standing in the college of his choice have been completed.

### ADMISSION OF SPECIAL STUDENTS

Special students are persons 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 admitting each applicant under this classification are assigned by the Registrar. Ordinarily, a personal interview is required before final action can be taken; and, in general, special students are required to confine their attention to some special study and its related branches.

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

No person under the age of twenty-one will be admitted as a special student, but 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 admitted to regular status, if not candidates for degrees, may, with the approval of the dean of the college, pursue elective or limited programs.

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

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

### ADMISSION FROM SCHOOLS AND COLLEGES IN FOREIGN COUNTRIES

The credentials of an applicant for admission from a foreign country, either in undergraduate or graduate standing, are evaluated under the general regulations governing admission. An application, with official certificates and detailed transcripts of records, should be submitted to the Registrar several months before the opening of the semester in which the applicant hopes to gain admittance. This will allow time for the necessary correspondence relative to entrance and, if the applicant is admitted, will aid 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 will permit him to profit by instruction in this University. An applicant's knowledge of English is tested by an oral and written examination given by the University. 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 he has acquired the required proficiency in 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 taken in the University or in another English-speaking institution of approved standing.

*Foreign Student Advisers:* 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. Each student from another country, upon his arrival at the University, is urged to consult the Foreign Student Adviser, Room 204, Library-Administration Building, Davis.

### LATE ADMISSION AND REGISTRATION

The student or prospective student should consult the University calendar for the dates upon which he is expected to register and begin work. Failure to register on the stated registration days will cause difficulty in making a satisfactory program and retard the progress of both the student 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 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 regulation applies both to old and new students.

A qualified student or applicant who fails to register on the stated registration days at the opening of the semester, but who, nevertheless, appears *during the first two weeks of instruction*, will usually be permitted to register. After the first week, however, he is required to obtain written approval from all the instructors in charge of his proposed courses and from the dean of his college, before his registration can be completed. In no event will a student be permitted to register or file his study list after Friday of the sixth week of instruction.

### ADMISSION IN GRADUATE STANDING

Admission to the Graduate Division may be accorded holders of the bachelor's degree from institutions of acceptable standing on presentation of official transcripts showing all college or university work completed to date together with official evidence of the degree conferred, provided the undergraduate program represents the usual college course of four years, the scholarship record is satisfactory, and the student can be accommodated in the field in which he wishes to pursue study. The University may deny admission to graduate standing in cases where the scholarship record has not been satisfactory or where the undergraduate program has not furnished an adequate basis for advanced work leading to academic or professional higher degrees or certificates. This applies to graduates of the University of California as well as to graduates of other institutions. *In the absence of official records and official evidence of graduation or receipt of degree, registration will not in any case be permitted.*

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

A formal application is required of all persons seeking admission to the Graduate Division, Northern Section, of the University. The application blank may be obtained from the Office of the Dean of the Graduate Division, 102 Administration Building, University of California, Berkeley 4, and must be



filed, preferably twelve weeks before the date of registration. It should be accompanied by a money order or bank draft for \$5 in payment of the application fee.† *The application fee is chargeable to every person who files an application and is not returnable under any circumstances.* (For readmission of former graduate students, see below.) If applications and complete records are filed later than twelve weeks before the date of registration, the student's registration may be delayed, and he may be charged the late registration fee of \$2.

Every new student, and every student returning to the University after an absence, must present, at the time of the medical examination by the University Medical Examiner, a certificate establishing the fact that he has been successfully vaccinated against smallpox within seven years. Vaccination should be completed prior to registration. A form for this purpose will be furnished by the University.

An application for readmission is required of persons formerly registered in a regular session as graduate students who wish to return after an absence. The form for this purpose is obtainable from the Registrar, and no fee is charged. Each applicant is required, however, to file official evidence that he has been satisfactorily vaccinated as explained in the above paragraph for new students.

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

Applicants for admission to the Graduate Division on credentials from universities and colleges in foreign countries must take the Examination in English for Foreign Students described in the preceding section, to demonstrate whether or not their command of English will enable them to profit by instruction in the University.

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

For further information concerning the Graduate Division see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, obtainable from the Registrar, the Assistant Dean of the Graduate Division, or from the Dean of the Graduate Division, University of California, Davis or Berkeley.

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

## GENERAL REGULATIONS

CERTAIN GENERAL REGULATIONS govern residence and study in the academic departments. Unless otherwise stated, these apply to both graduate and undergraduate students.

### ROUTINE OF REGISTRATION

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

The prospective student should plan to arrive in Davis on Monday of registration week. A registration circular, which gives details of registration, is published each semester and is available on request. All new undergraduate students may be required to take certain examinations, including Subject A, which are scheduled for specific hours on Tuesday and Wednesday. A fee of \$1 is charged any student who fails to take a required examination at the prescribed time.

A student in 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. The authorization of the proper faculty must, however, be obtained by written petition before preparation for the examinations is begun.

Each student must file a study list with the Registrar at the time and place designated, showing his choice of courses to be pursued in any semester. Registration at a later date requires special permission. For further information, see "Late Admission and Registration," page 27.

In year courses the student must register for these courses at the beginning of each semester. He sometimes may 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.

Concurrent enrollment in resident courses and in extension courses is permitted only when the student's entire program has received the approval of the proper dean or study-list officer and has been registered before the work is undertaken.

After the study list is filed, a student may request changes in program 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 work. The Committee on Study Lists is authorized to withdraw study cards that do not comply with this regulation.

The name of any student who fails to comply with the regulations governing registration will not appear on the official class rolls.

### MEDICAL AND PHYSICAL EXAMINATION

To safeguard the health of the student and the University community, every new student (graduate and undergraduate) prior to the filing of his registration papers must visit the University Medical Examiners and pass a medical examination. Every new student (graduate and undergraduate) must possess at the time of registration a certificate testifying to successful vaccination against smallpox within the last seven years. A form for this purpose is furnished by the University. Tests for tuberculosis are a part of the examination



The Gymnasium

for all new students. Applicants for admission who have contagious diseases will be excluded. Any having physical conditions which grossly disturb the classwork of other students, such as convulsive seizures, should not apply for admission.

It is desirable that each prospective student have a physical examination by his own physician to determine his fitness for college work before coming to the University. Any defects capable of remedial treatment, such as diseased tonsils or imperfect eyesight, should be corrected to prevent possible loss of time from studies.

### **STUDENT HEALTH SERVICE**

The University maintains a Student Health Service on each major campus to conserve the time of students for their classwork and studies, by preventing and treating acute illnesses. This service is made possible in part 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 Davis may, at need, have such consultations and medical care on the campus as the Service is staffed and equipped to provide, from the time of payment of his registration fee to the last day of the current semester or the date of official withdrawal from the University. Surgical treatment is also included in the services offered when, in the opinion of the University Physician, this is necessary and within the limitations herein outlined.

During the semester, hospital care for a period up to thirty days may be given in the event of serious illness, on the recommendation of the University Physician. If at the end of the semester the patient is still ill he will be released from the hospital to the care of his home or community as soon as the University Physician considers it safe. Also, if injuries or illnesses are of a nature requiring prolonged care which will obviously prevent the continuance in college during the current semester, the patient will be returned to his community or home for definitive treatment. No surgical diagnosis will be made (as, for example, tumors of the bone) if such diagnosis would prevent the student from returning to college the same semester, or if it might necessitate immediate definitive treatment preventing the student's return to classes the same semester. 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 dealing with any chronic physical defects or illnesses present at the time of entrance to the University (for example, hernias, chronic bone and joint diseases or deformities, chronic gastrointestinal disorders, fibroids of the uterus, chronically infected tonsils, tuberculosis, syphilis, malignant diseases, allergic and endocrine disorders). Further, it does not take responsibility for any injury or illness wherein treatment has been initiated elsewhere, with the exception of first aid and emergency care. It does not take responsibility for treating remedial defects where medical or surgical treatment is elective and not of an emergency nature, and where the student's best interests will be served by treatment during vacation.

### **PHYSICAL EDUCATION AND USE OF GYMNASIUM**

All students, by paying the incidental fee, are privileged to use the gymnasium, swimming pool, tennis courts, and athletic fields. Equipment for games and sports is available for exercise and recreation, either with or without instruction.

### SUBJECT A: ENGLISH COMPOSITION

Every undergraduate entrant (except as noted below) must, when first registering in the University, take the *Examination in Subject A*, as a test of his ability to write English without gross errors in spelling, grammar, sentence structure, and punctuation.

This examination is offered at the opening of each fall and spring semester (see REGISTRATION CIRCULAR, obtainable from the Registrar). For late registrants a second examination (fee \$1) is given not more than two weeks after the first of each semester.

Results of the first examination are available on the following day. Students are graded as "passed" or "not passed." Any student absent from the required examination in Subject A is treated as having failed.

Every student who fails the Subject A examination must enroll in the special *Course in Subject A* (three hours weekly for one semester) which is without unit credit toward graduation. This course is subject to the same rules of grading as other University courses. A fee of \$20, payable before the study list is filed, is required for this course; the charge is repeated each time the student takes the course.

A student who has failed the examination in Subject A cannot take a second examination, but must enroll in the course in Subject A.

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

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

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

A student who maintains a grade of A in the course in Subject 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 considered as having fulfilled the Subject A requirement. Should any student fail in this course, he will be required to repeat the work in the next succeeding semester of his residence in the University.

### AMERICAN HISTORY AND INSTITUTIONS

Every student who intends to be a candidate for the bachelor's degree must demonstrate a knowledge of American History and Institutions. He may meet the requirement in any of the following ways:

1. By passing a single examination (without unit credit) in American History and Institutions.
2. By completing any two of the following courses, subject to the conditions noted below: † History 17A, 17B, 169, 174A, 174B, 176A, 176B, 178, 187; Political Science 1, 113, 128, 157A, 157B.

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

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

3. (a) By automatic equivalence granted for courses offered by collegiate institutions within the State of California, provided an official student's transcript of record indicates satisfaction of the requirement by such courses.

(b) By presenting a certificate of completion of acceptable courses at other collegiate institutions. Certificates may be obtained from the office of the Supervisor.

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

Further information concerning this requirement and concerning the examination necessary to meet it may be obtained from the Supervisor of the Requirement of American History and Institutions, Room 13, TB 1, Davis.

### MILITARY SCIENCE

Under the Act of Congress establishing the land-grant colleges, instruction in military science must be included in the curricula. The Board of Regents of the University of California has therefore directed that every undergraduate male student must pursue the study of military science during the first two years of residence.

Students must list the prescribed courses in military science on their study cards with other University courses. A petition for excuse from, or deferment of, military science must be filed within two weeks of the date of registration. Exception will be made where illness or physical disability occurs after that date. Further information about the requirement in military science, including a statement of the grounds upon which students may be excused, may be obtained from the Registrar.

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

### THE RESERVE OFFICERS' TRAINING CORPS

The Reserve Officers' Training Corps was established by Act of Congress in 1916. Its purpose is to train junior officers possessing qualities and attributes essential to their progressive and continued development in the United States Army Reserve and in the Regular Army. Military leadership is emphasized, with instruction in subjects common to all branches of the Army and in tactics and technique of the several branches. The University of California at Davis has a unit of the Reserve Officers' Training Corps, in which instruction by Army officers is offered in the tactics and technique of Infantry. The United States Government furnishes arms, equipment, uniforms, and textbooks for the use of all students enrolled in courses of the department. The R.O.T.C. program consists of two parts: 1) the required basic course, and 2) the elective advanced course and summer camp.

The lower division (basic) course is prescribed for all first-year and second-year undergraduate male students who are not otherwise exempt. During

the first year, the instruction is of a general type, applicable to the Army as a whole. In the second and later years, students receive specialized instruction in tactics and technique of the Infantry.

The upper division (advanced) course is open to students who successfully complete the basic course or who have received credit in lieu thereof, and to veterans having over one year of military service who meet the age and physical requirements. Students selected for the advanced course are those who have shown potentialities for leadership and command, and promise of developing into efficient officer material. Successful completion of the advanced R.O.T.C. course, and four years of education at the college level, will qualify the student for appointment as a Second Lieutenant in the United States Army Reserve. Students who complete the advanced course are also eligible to be commissioned in the University Cadets by the Governor of the State of California.

### STUDY-LIST REGULATIONS

At the beginning of each semester each student must file with the Registrar, on a specified date, a detailed study list bearing the approval of a faculty adviser or other designated authority.

The presentation of this study list and its acceptance by the college are evidence of the student's obligation to perform 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 formal permission from the dean of the college, makes the student liable to enforced withdrawal from the University, or to other appropriate disciplinary action.

Each college has certain study-list limits with which the student must comply. Detailed regulations of the respective colleges are given in later pages of this bulletin.

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

Every student must satisfy his instructors, in such ways as they may determine, that he is performing his work in a proper manner. Instructors will report to the President from time to time the names of students whose attendance or work is unsatisfactory.

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

*Other general requirements.*—The student's attention is directed to further University regulations concerning the requirements in scholarship, and concerning candidacy for degrees. The student should plan his program of studies carefully in relation to these requirements, and consult promptly with his adviser or the dean of the college or school concerning any irregularities in the program that may require special approval.

### 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 filing this announcement later than the appointed date, a fee of \$2 is charged. In 1953-1954 these dates are: Monday, October 5, for candidates who expect to com-

plete their work in January, 1954; and Monday, March 1, for candidates for graduation in June, 1954.

All candidates for the bachelor's degree must 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 applies both to students entering 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 must be completed at this University in resident courses of instruction during 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 may transfer from one major department to another after the opening of the last semester of his senior year.

### HONORS

Honor students include those who 1) have completed 60 units with at least a B average in the College of Agriculture, 2) have received honorable mention with the degree of Associate in Arts or upon attaining junior standing in the College of Letters and Science (Davis). Honors are granted also with the bachelor's degree. Regulations concerning honors are given with explanations of curricula in the various colleges, in later pages of this bulletin.

### CREDIT AND SCHOLARSHIP

In both the University and the high school the amount of the student's work is evaluated in terms of units; the quality of his scholarship, in terms of grades. For more exact determination of the scholarship, the University assigns a numerical value in grade points to each scholarship grade (see below).

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

High school credit, when 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 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 and 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 regarded as equivalent to one University semester's work of college level; that is, a student desiring to make up any high school subject deficiency by offering work of college level can in one University semester earn as much credit as in one high school year.

The value of a University course in units is one unit for three hours of work by the student per week per semester. The credit value assigned to a course is determined by the number of hours of work required of the student and not by the number of class meetings per week. For most courses the average student is expected to spend two hours in preparing for one hour of lecture or recitation.



### GRADES OF SCHOLARSHIP; GRADE POINTS

The result of a 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 among the members of a class.

Grade E (not passed) indicates a record below passing, but one which may be raised, without repetition of the course, by success in 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.

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 or in the College of Agriculture, the student must obtain 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.

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

### 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, a student dismissed for unsatisfactory scholarship will be excluded from the University for an indefinite period, and his connection with the University is presumed to be ended by such exclusion.

The conditions under which *undergraduate students* may be dismissed are:

*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

- (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.

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 a student under their supervision; or, by suspending the provisions of this regulation, they may permit a student subject to dismissal to remain in the University or permit the return to the University of a student dismissed under this regulation.

Graduate students who acquire scholarship deficiencies are subject to action at the discretion of the Dean of the Graduate Division.

### CREDIT BY EXAMINATION

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 on the student's record in the same manner as are regular courses of instruction. 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 University courses undertaken.

Arrangements must be made in advance with the dean of the student's college or school; his approval, and that of the instructor 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. All examinations will, as far as practicable, be conducted in writing. For each, a maximum time will be assigned beforehand which no student is allowed to exceed. The time for examination sessions will be not 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 among the regular requirements in a course, there can be no individual exemption, 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.

Reexaminations are permitted only for the purpose of raising grade E (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. Methods of raising nonpassing grades to passing grades are described 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 Registrar upon entrance.

### REMOVAL OF DEFICIENCIES

A student who receives a grade lower than C in a lower division course may, on repeating the course, receive the grade assigned by the instructor and grade points appropriate to that grade. The foregoing privilege does not apply to grades in upper division or graduate courses. A student who receives grade E or F in an upper division or graduate course may, on successfully repeating 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, before such service, had undertaken one or more courses forming part of an announced sequence. Such a student may, with the approval of the dean of his college or school (or if he is a graduate student, with the approval of the Assistant Dean of the Graduate Division), be permitted to repeat any course previously undertaken in the sequence, irrespective of the grade previously assigned, and to receive the new grade assigned by the instructor and grade points appropriate thereto; provided, however, that for a course so repeated the student may receive unit credit toward graduation, or toward the satisfaction of major requirements, only in an amount not to exceed the difference between the full unit value of the course and the number of units, if any, which he has previously received from the same course.

For the purpose of raising an E to a passing grade the student may, with the consent of the instructor concerned and of the dean of the appropriate school or college, have the privilege of a "condition examination." Reexaminations for removal of deficiencies are not provided in Summer Sessions courses.

Any examination, term paper, or other exercise which the instructor may require of the student to raise an 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; 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 an E to a passing grade, \$2 is charged. The fee for a permit for two or more special examinations of this type is \$3. There is no fee 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. The Registrar will provide a form of petition for a special examination or for admission to an examination with a class, with instructions concerning procedure. Grade E in a course in which a final examination is regularly held can be raised to a passing grade only if the student passes a satisfactory final examination.

If a student who has received a 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. But if, meanwhile, the student has repeated the course and has again received an 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 a grade D or higher in any course following a reexamination for the purpose of raising an E to a passing grade, will be given a grade of F in the course.

Ordinarily, no grade points shall be assigned to a student who raises a grade E or F, incurred in an upper division or graduate course, to a passing grade by *successfully repeating* the course; or to 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). An exception to this rule is permitted, however, when the deficiency consists solely in the *omission* of the final examination or other required exercise because 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, to the Dean of Students; by graduate students, to the Assistant 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 of \$1 is charged for each additional transcript. Students who plan to teach or to seek other employment after graduation, should obtain one or more transcripts as official evidence of attendance at the University.

Application for a transcript of record should be made directly to the Registrar one week in advance of the time when needed.

### LEAVE OF ABSENCE AND HONORABLE DISMISSAL

A student in good standing who has need to withdraw for a short time but who wishes to retain his status in classes and resume work before the end of the current semester should apply for a *brief leave of absence* which expires on a definite date. A petition for this purpose is available from the Registrar. No excuse for absence will relieve a student from the need to complete all work in each course to the satisfaction of the instructor.

For any college exercise other than a final examination, leave to be absent or an excuse for absence should be presented to the instructor in charge. Leave to be absent from a final examination should be sought by written petition to the proper faculty.

If a student must depart suddenly, as in a family emergency at home, he should write the Registrar as soon as possible, requesting a leave.

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

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

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

### DISCIPLINE

The University authorities assume that the student 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

authorities will take such action as, in their opinion, his conduct warrants. Students who fail to utilize properly the opportunities freely given to them by the University must expect to have their privileges curtailed or withdrawn.

*Administration.*—By authority of the Academic Senate, the President of the University administers student discipline and has full power to act. He accomplishes this duty through the assistance of his teaching staff, the administration officers concerned with student welfare, and the Faculty-Administration Committee on Student Discipline.

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

*Student self-government.*—The Welfare Council of the Associated Students advises the Faculty-Administration Committee on Student Discipline regarding student views on conduct, penalties, and procedures, and recommends measures for improvement of student conduct. The Council is responsible for a program to create among the students attitudes and opinions favorable to good conduct.

## MISCELLANEOUS INFORMATION

### SITE AND CLIMATE

THE DAVIS CAMPUS of the University of California is adjacent to the City of Davis in the center of the Sacramento Valley. The University properties, totaling more than 3,000 acres, are in a prosperous agricultural area of varied crops and livestock production. Sacramento is 13 miles to the east, while Berkeley and San Francisco are within two hours by rail, bus, or automobile.

The climate at Davis is typical of the Great Central Valley of California, cool in the winter rainy period, and warm in the long, dry summer season. Average winter temperatures (December to February) are about 47° to 51° F; summer temperatures (August and September) average about 71° to 75° F. The heat of summer is tempered by breezes from the Bay Region that make for cool nights. The average annual rainfall is 17 inches.

### EXPENSES OF STUDENTS

It is not possible to give exact figures for the budget of a student on the Davis campus; costs will vary according to personal tastes and the financial resources of the individual. In general, total expense for a college year of two semesters will average about \$900 for residents of California and \$1,200 for nonresidents. Expenses of about \$200 for resident students and \$350 for nonresident students are necessary during the first month upon entering college. It is possible to live simply and to participate moderately in the life of the student community on a limited budget. The best that University authorities can do to assist the student in planning his budget is to indicate certain expenses and to mention others that will probably be necessary.

*Tuition.*—For residents of California tuition is free. Any student classed by the University Attorney as a nonresident pays a tuition fee of \$150 per semester in addition to the incidental fee (see nonresident tuition below).

*Incidental fee.*—The incidental fee at Davis is \$42.50 each semester for undergraduates and \$35 for graduates. This fee, which must be paid on the date of registration, covers certain expenses of students for use of library books, for athletic and gymnasium facilities and equipment, for lockers and washrooms, for registration and graduation, for all laboratory and course fees, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service. 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 Davis 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.

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

*Miscellaneous expenses.*—Books and stationery for a student in liberal arts courses average \$50 to \$70 a year. Books and special equipment for students in the preprofessional and professional programs cost \$50 to \$200. Exact information on these items may be obtained by writing directly to the school or department. Women students taking physical education are required to buy gymnasium shoes which cost about \$5. Students who fail to pass the required examination in Subject A must pay a fee of \$20 for the course in Subject A (see page 32).

*Nonresident tuition.*—The University charges a tuition fee to every student who has not been a legal resident of the State of California for 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 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 is classified as a nonresident if he 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.

Tuition in the academic colleges is free to students who have been residents of the State of California for 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 in addition to the incidental fee. On the approval of the Dean of the Graduate Division, the nonresident tuition fee may be remitted for graduate students in the academic departments who enter without deficiencies, who have proved that they are distinguished scholars, and who are carrying full programs toward the fulfillment of requirements for academic higher degrees. For conditions of eligibility for exemption from, and of possible commutation of, this fee, see the ANNOUNCEMENT OF THE GRADUATE DIVISION.

Any student in doubt about his residence status may communicate in person or by letter with the Attorney for the Regents in Residence Matters,  $\frac{7}{8}$  the Registrar, or at Room 910, Crocker Building, San Francisco 4, California.

*The eligibility of a person 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 after an absence, is required to make a "Statement as to Residence" on the day of registration, on a form provided for that purpose, and his status with respect to residence will be determined by the Attorney soon after registration. Application by former or continuing students for reclassification in resident status must be filed within ten days after regular registration; and by late registrants, within one week after registration. No application may be made for a change of classification with respect to some preceding semester.

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

### **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. 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; and if 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 must 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.

### **LIVING ACCOMMODATIONS**

Advice and information about all types of living accommodations may be obtained from the Housing Office. The University maintains residence halls for men and women, dining halls, and emergency housing apartments for married veterans. Board and room in the University dormitories cost about \$320 a semester. The price is about the same in private homes in the city of Davis and in the fraternities.

Rooms in the residence halls contain the necessary furniture, linen, and blankets; the rent includes the weekly laundering of linen. For further information write to the Housing Office, University of California, Davis.

Householders and students are expected, at the time arrangements are made for accommodations, to have a contract in writing which covers terms of payment, indicates whether or not rent is to be paid during vacations and what laundry facilities are available, states the number of meals served per day, and includes any other matters which would affect mutual business relations. Students should read with care any contemplated contract, in order that no misunderstanding may arise on the part of either the householder or the student. Contracts for residence in the University residence halls are for the period of a semester.

Every undergraduate student is required to file a residence card. No approval is required for the college residence of men students. All women students are required at registration to have their college residence approved by the Counselor for Women. 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. Undergraduate women students who do



not live in their own homes are expected to live in houses approved by the University. Every undergraduate woman must have the written endorsement of the Counselor for Women for her college residence before completing her registration. Every undergraduate woman under 21 years of age not living in campus housing must have not only the permission of the Counselor for Women for her college residence, but also the permission of her parent or guardian, whose approval must be indicated by signature on the women's residence card provided at registration.

*Fraternities.*—Fraternity membership is by invitation only. Most of these organizations provide living quarters and meals for their members. Information about fraternities may be obtained by addressing the Dean of Students on the Davis campus.

### STUDENT EMPLOYMENT

Many students who attend the University expect to earn a part of their expenses. However, the undergraduate curricula are organized on the assumption that a student will give most of his time and attention to college studies and, if possible, the student should avoid outside employment until he has become adjusted to his new environment, has established sound study habits and is maintaining a good scholastic standing. By the end of the first semester the student should know the demands of University life and his own capabilities well enough to plan a program combining studies and work for subsequent semesters.

A limited number of part-time jobs is available to students who can adjust their academic programs to the employers' needs. Usually, programs must be arranged before referrals for employment can be given. Men with a limited amount of time or difficult schedules may often supplement their income by doing casual work such as gardening, housework, or miscellaneous odd jobs on the campus and in the community. Some jobs for room, board, or both are available with work hours adjustable to the academic schedule.

Women students have some opportunities for work in food service on the campus. Private homes occasionally provide room and board in exchange for assistance within the home. There is also a limited amount of clerical and stenographic work, though hardly enough to meet the student demands.

The University Bureau of Occupations assists students in finding part-time employment both on and off the campus. There is no charge for this service. Personal interviews are necessary as arrangements cannot be made satisfactorily by correspondence. Those wishing part-time work should register with the Bureau of Occupations upon arrival on the campus.

### OPPORTUNITIES FOR ACQUIRING AGRICULTURAL SKILLS

Many students who enroll as undergraduates in the College of Agriculture with the intention of making a career in the production fields of agriculture have had little or no opportunity to acquire the basic manual skills that form an essential part of successful farming.

The University of California does not prescribe practical farm experience as a requirement for graduation nor does it grant degree credit for the acquisition of manual skills attained by repetitive practice.

As a result of a grant by the late Mr. Fred H. Bixby, the Division of Farm Practice was organized to assist undergraduates in acquiring such practical farm experience.

Each new student is questioned as to his agricultural experience and facility with the skills involved in his proposed major subject. The results are placed in the hands of his individual academic adviser.

Two separate programs are open to him under the supervision of the Farm Practice Division working coöperatively with the subject matter division of the student's major subject. In some fields there is ample opportunity for all major students to find employment in connection with Experiment Station projects dealing with production problems.

For others, however, land has been allocated to the Farm Practice Division where students may learn, by actual doing, the use of farm implements and the various manual skills.

In addition, the Farm Practice Division will assist students in finding opportunities with selected farmers in all areas of the State where they may participate as employees in various farm operations to supplement their college instruction. Many students find that the summer vacation period is the most convenient time to enlarge their knowledge and skill in farm operations, while others may find it advantageous to take a leave of absence for a semester or more to insure participation in at least one complete production cycle.

During the period of employment, a Farm Practice representative makes frequent visits to the student and his teacher-employer to develop records and recommendations that will be of value to the student when he seeks permanent employment upon graduation. Also, many students find that they are able to establish contacts that lead to permanent jobs as the result of such practical training employment.

Students who have had limited practical farm experience are encouraged to discuss this problem with their faculty advisers and to contact the Farm Practice Office soon after registration, to insure sufficient time for the development of a job opportunity that best meets their requirements for practical training in farming and to avail themselves of the noncredit skills training program that is in operation on the campus.

### **VETERANS AFFAIRS**

The Office of Veterans Affairs maintains liaison between veterans and the Veterans Administration, the State Department of Veterans Affairs, and other agencies offering veterans educational benefits, and assists veterans in becoming assimilated into the life and spirit of the University. This office is located in Room 207, Library-Administration Building. Offices of the United States Veterans Administration are located as follows:

Oakland Sub-Regional Office, 1305 Franklin Street, Oakland, California  
San Francisco Regional Office, 49 Fourth Street, San Francisco, California  
Sacramento Office, 921 Tenth Street, Sacramento 14, California

In order to enroll under the provisions of Public Law 346 (G.I. Bill) and obtain full veteran benefits, veterans must present an original or supplemental Certificate of Eligibility, register within the University's announced registration period, and file a study list. In order to enroll under the provisions of Public Law 16 (Rehabilitation), authorization to complete such enrollment must be obtained from the United States Veterans Administration Office and be received by the Office of Veterans Affairs prior to registration. Veterans should apply to their local United States Veterans Administration Office in sufficient time to receive a Certificate of Eligibility or proper authorization prior to registration, or the veteran must be prepared to pay all expenses (tuition, fees, books, and supplies). Refunds of such expenditures may be made later to the veteran student based upon the effective date of the Certificate of Eligibility.

Veterans who are transfers from the Berkeley or San Francisco campuses

of the University of California without a change of objective or degree, and whose training under Public Law 346 has not been interrupted in excess of four months, need only present a Veterans Transfer Notice from the campus last attended. A veteran must present a supplemental certificate if (1) he has been out of training more than four months, (2) he has not completed the last term or session in which enrolled under veterans benefits, (3) he has attended University Extension; or (5) he last attended a campus within the regional jurisdiction of a different Veterans Administration region. If the transfer is into a different Veterans Administration region, the veteran should request a transfer of his files to the proper regional office.

Information regarding educational benefits available from the State of California (CVEI) may be obtained from the State Department of Veterans Affairs located at 700 Capitol Avenue, Sacramento, California, or by writing to 515 Van Ness Avenue, San Francisco, California.

Veterans wishing to enroll under the provisions of Public Law 550 ("Korean" G. I. Bill) should obtain from the United States Veterans Administration a Certificate for Education and Training which should be filed with the Office of Veterans Affairs upon completion of registration. These veterans must be prepared to pay all fees and educational costs at the time of registration as education and training allowances are paid to the veteran by the Veterans Administration. The first monthly payment will normally be received 60 to 75 days after compliance with the above.

### SCHOLARSHIPS, PRIZES, LOANS

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

*Scholarships and Fellowships.*—A circular giving information about undergraduate scholarships may be obtained from the Registrar. Students who maintain an excellent scholarship standing are eligible to make application. Awards are made on the basis of scholarship, financial need, character, and promise. Holders of undergraduate scholarships must enroll for a minimum of 12 units a semester. Applications for scholarships for any academic year (July 1–June 30) must be filed with the Committee on Undergraduate Scholarships not later than the preceding December 31 by students already in attendance, and not later than March 1 by entering students. Application forms are available each year from the beginning of the last week in November in the office of the Committee on Undergraduate Scholarships.

Information about fellowships for graduate students may be obtained from the Assistant Dean of the Graduate Division. Fellowships and graduate scholarships are ordinarily awarded as a mark of honor, on the basis of scholarship, and 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 Assistant Dean of the Graduate Division not later than February 20 (February 21 when the 20th falls on Sunday), prior to the academic year for which the award is sought.

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

*Loans.*—The loan funds for both graduate and undergraduate students are administered in the office of Dean of Students. Loans are not available to students in their first semester of residence at the University. Applicants are

required to have a creditable scholarship record and must present a satisfactory repayment program. There are no loans available by which a student may finance his entire college course.

### STUDENT ACTIVITIES

Students participate both in the general student affairs of the University and in their own activities. The entire student body has membership in the Associated Students, an organization which governs all student affairs on the campus and supervises the honor system.

The students publish the *California Aggie*, a weekly newspaper, and *El Rodeo*, a yearbook.

Opportunity to participate in many forms of athletics is presented. The University of California at Davis is a member of the Far Western Conference and stresses both intercollegiate and intramural athletics. The major sports include football, basketball, boxing, track, and baseball; the minor sports are tennis, wrestling, golf, riding, swimming, and skiing.

The Associated Students support other activities including a band, an orchestra, the men's and women's choruses, debating, dramatics, radio broadcasting, and the rifle team. The California Club is an organization designed to emphasize the unity of student life on all campuses of the University.

Many organizations sponsor the development of special interests. The Music Association encourages the further use of talents; the Women's Association includes all women students on the campus; and the International Forum promotes friendly relations between foreign-born and native students, and studies world problems. Students in agriculture maintain clubs serving those interested in various special fields.

# REQUIREMENTS AND CURRICULA IN THE SEVERAL COLLEGES AND SCHOOLS

## COLLEGE OF AGRICULTURE\*

THE PROSPECTIVE STUDENT should read the requirements and recommendations for admission on pages 17-28.

### Faculty Advisers and Study-List Requirements

*Freshman and Sophomore Years.*—No Associate in Arts degree is given in the College of Agriculture. Each student designates a major subject upon matriculation and must consult his adviser each semester for guidance in following the requirements of the curriculum which includes the major of his choice. Program schedules for the freshman and sophomore years are shown for each curriculum. Students who are unable to meet the suggested outlines of study during the first two years may take some of the requirements in their junior or senior year. It should be noted, however, that any great departure from the recommended programs may delay graduation beyond the normal four-year period.

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

*Approval of Study List.*—The study lists of all students must be endorsed by the major-subject adviser before they may be filed with the Registrar. Students will not be permitted to enroll for fewer than 12 or more than 18 units a semester without approval of the Dean of the College of Agriculture.

### Honors

*Honors in Junior and Senior Years.*—Students who have completed 62 units with an average of at least 2 grade points for each unit undertaken and who maintain this average are designated as honor students, receiving recognition in the student directory and certain privileges in the use of the library.

*Honors at Graduation.*—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. The student who has done work of unusual excellence may be recommended for highest honors. The list of students to whom honors and highest honors in the College have been awarded is published in the COMMENCEMENT PROGRAM.

### Requirements for the Degree of Bachelor of Science

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

1. Satisfy the general University requirements as follows:

- (a) *Subject A.* The Subject A examination in English composition is required of every undergraduate student at the time of his first registration in the University.
- (b) *Military or Naval Science* (for male students).

\* For details concerning agricultural curricula on the other campuses, see PROSPECTUS OF THE COLLEGE OF AGRICULTURE, obtainable without charge from the Registrar, University of California, Davis.

- (c) *American History and Institutions.* The student may meet this requirement by the passing of an examination in American History and American Institutions or by the completion of courses prescribed by the University.
  - (d) *Residence in the University during the senior year* in the college in which the degree is to be taken.
  - (e) *Attain at least as many grade points as units of credit* in courses undertaken at this University.
2. Satisfy the general requirements of the College of Agriculture as follows:
- (a) *At least 12½ units of University work.* Not more than 4 units may be in lower division physical education courses.
  - (b) *Thirty-six units of the above total in upper division courses* (courses numbered 100-199).
  - (c) *Nine units of mathematics.* Matriculation work may be offered toward this requirement, counting each year of high school work as 3 units. Trigonometry taken in high school is recommended as partial satisfaction of this requirement.
3. Satisfy the requirements of one of the following curricula in the College of Agriculture.

#### AGRICULTURAL ECONOMICS

Instruction in agricultural economics is intended to prepare the student for leadership in rural affairs. A wide choice of courses within the required fields is permitted. Thus, the student may obtain a broad university education without sacrifice of the training essential to successful raising, processing, and marketing of farm products. It is sought to foster in the student an ability to analyze the impact of economic forces upon general welfare, as well as upon the economic efficiency of the farm enterprise. There are three major fields in which graduates from this department are employed. Many engage in farming as proprietors or managers. Others are employed by commercial agencies, by agricultural marketing organizations, by handlers of farm products, materials, and equipment, or by farm credit agencies. Still others become teachers (after additional graduate work) or obtain work with public agencies, such as the agricultural extension service, and state and federal agencies dealing with economic issues. Students who expect to become professional agricultural economists should complete one or more years of graduate work.

There are no formal subdivisions or major groups within the agricultural economics curriculum although students are permitted to develop various sub-fields by selection of courses within the required curriculum. Thus, the major in agricultural economics may consist of general studies within the curriculum or it may emphasize farm management, land economics, or marketing. Students who plan a particular emphasis should consult with their major adviser in order that during the freshman and sophomore years an appropriate selection of courses may be made to prepare properly for the expected field of emphasis. A student planning an emphasis in farm management or land economics will be advised to take certain work in the physical sciences, and in soils, irrigation, and agricultural engineering. Similarly, those planning an emphasis in marketing will be advised on an appropriate selection of courses.

Attention is called to the fact that not all of the courses in agricultural economics are offered both at Davis and at Berkeley and that only a few courses are offered at Los Angeles. Although a major in agricultural economics may be completed either at Davis or Berkeley, the student desiring to emphasize farm management will find a more ample selection of courses in other departments at Davis while the student desiring to emphasize land economics or marketing will find a more ample course offering at Berkeley.

To graduate with a major in agricultural economics, a student must have at least a grade C average in all courses taken in agricultural economics. Students who do not maintain such an average may be required to withdraw from the major at any time.

#### Curriculum in Agricultural Economics

(a) Required:	Units
Bacteriology, botany, chemistry, geology, physics, physiology, zoölogy, or additional mathematics*	18
*Mathematics	6
English or speech	6
Business administration or economics	15
Anthropology, geography, history, philosophy, political science, psychology, or sociology and social institutions	12
Agriculture	15
	<hr/> 72

(b) In addition to the above, every student must complete at least 15 units of upper division work in agricultural economics selected with the approval of the major adviser.

One course in statistics is required, which may also be used to satisfy the business administration or economics requirement indicated above.

#### Example of Agricultural Economics Program

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
English 1A-1B	3	3	Business Administration 1A	3	3
Chemistry 1A, 8	5	3	Mathematics 13	3	3
Economics 1A-1B	3	3	Physics 2A-2B	3	3
Mathematics 11A-11B	3	3	Physics 3A-3B	1	1
Elective	..	2	Geology 1	..	3
			Animal Husbandry 7	3	..
			Agronomy 1	3	..
			Agricultural Engineering 12	..	2
			Elective	..	2
	<hr/> 16	<hr/> 16		<hr/> 15	<hr/> 16

#### AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

This curriculum provides a broad agricultural training for students who desire a general course in agriculture. Two specializations or majors are available:

(1) a major in agricultural education for those who intend to qualify for teaching agriculture in the high schools and junior colleges of the State, and  
 (2) a major in general agriculture for students who desire preparation for occupations requiring training which may involve two or more major agricultural fields.

The basic requirements provide a good foundation in the physical and biological sciences and in English and economics, and include the necessary prerequisites for many courses in all of the major agricultural departments. These general requirements include 50 units of course work. In addition to the basic preparation, introductory courses in animal husbandry, dairy industry, poultry husbandry, agronomy, vegetable crops, horticulture, and agricultural engineering and upper division courses in each of the major agricultural departments are available to make up the 50 units of required work in agriculture.

\* This requirement is satisfied by courses in college algebra, analytic geometry, and calculus. Students should consult advisers regarding this requirement.

**Majors**

(1) *Agricultural Education.*—This major is designed specifically to provide the undergraduate preparation required for teaching agriculture in California high schools and junior colleges. It provides the preparation required for teaching vocational agriculture under the Smith-Hughes Act and for the special secondary credential in that subject, as well as for teaching general courses in agriculture and related science. (See "Requirements for Teaching Credentials," page 91.)

State Department of Education requirements for the special vocational credential include the following:

1. Three years of farm experience or its equivalent.
2. Technical agriculture subjects totaling 60 units selected to insure that the minimum number of units are included in each of the following fields:

	<i>Minimum</i>	<i>Recommended</i>
(a) Plant and soil science.....	15	20
(b) Animal science .....	15	20
(c) Agricultural engineering and mechanics.....	8	10
(d) Agricultural economics and rural sociology..	6	10

Students who have not acquired the requisite farm experience should consult their major adviser for assistance in arranging for summer work.

There are two credentials which authorize the holder to teach general agriculture: the general secondary credential and the special secondary limited credential. The special secondary limited credential authorizes the holder to teach the agricultural subjects named in the credential and requires 8 units of work in each of the subjects named. A special secondary credential in vocational agriculture entitles the holder to teach vocational agriculture in departments organized under the Federal and State Vocational Acts.

For requirements of the general secondary credential see "Requirements for Teaching Credentials," page 91.

(2) *General Agriculture.*—Among the occupations for which this major provides preparation are the following: farming, agricultural extension and farm advisory work, sales and service positions with firms which process and distribute agricultural products and equipment, and for positions with federal and state departments of agriculture.

The basic requirements are identical with those of agricultural education, but the 50 units of agriculture may be selected in terms of the training needed, provided the minimum requirements are met.

**Curriculum in Agricultural Education and General Agriculture**

<i>(a) Required:</i>	<i>Units</i>
Chemistry .....	13
Physics .....	6
Botany and zoölogy (including laboratory); and additional botany, zoölogy, or bacteriology.....	12
Soil science or geology.....	3
Genetics .....	4
Economics .....	6
English and/or speech.....	6
	50



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

Certain courses are required by the following majors:

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

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

A minimum of 8 units of Agricultural Engineering must be completed in this major.

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

#### Example of Agricultural Education and General Agriculture Program

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science .....	2	2	Military Science .....	2	2
Chemistry 1A-1B .....	5	5	Physics 2A-2B .....	3	3
Animal Husbandry 7 .....	3	..	Economics 1A-1B .....	3	3
Animal Husbandry 8 .....	1	..	Bacteriology 2 .....	4	..
Botany 1 .....	..	5	Chemistry 8 .....	3	..
Zoölogy 1A .....	4	..	Poultry Husbandry 1 .....	..	3
Elective .....	..	3	Pomology 2 or 12 .....	3	..
			Vegetable Crops 1 .....	..	3
			Elective .....	..	3
	15	15		18	17

#### ANIMAL SCIENCE

The animal science curriculum is designed to train men in the fundamentals of animal production, including the handling and processing of animal products. It thus covers a very broad field. The courses include the physical and biological sciences, with English and economics, in a general requirement of 67 units listed below.

This is followed by a wide range of specialization in the upper division work between and within the majors involved—animal husbandry, genetics, and poultry husbandry.

Graduates are fitted to enter a variety of animal-production and technical fields, including general agriculture. They may also become teachers (after additional graduate work) and investigators, or proceed with graduate work in genetics, nutrition, agricultural chemistry, and physiology, or complete the course in veterinary medicine.

#### Majors

*Animal Husbandry.*—Instruction in animal husbandry deals with the basic sciences and their application to livestock husbandry, with special reference to conditions in California.

The department has developed herds and flocks of several breeds of each species of livestock of economic importance. These are used for student instruction in breeding, feeding, management, and judging.

Nutrition, physiology, genetics, and wool laboratories, a respiration chamber and a psychrometric room for large animals, and a small animal colony are provided in the Animal Science Building. The departments of Zoölogy, Agronomy, and Entomology and Parasitology, as well as the School of Veterinary Medicine, cooperate closely in research and teaching with the Animal Husbandry Department.

**Genetics.**—The principles of genetics are the same in plants and animals (see "Plant Science," page 59), but mathematical and statistical methods play an especially important role in the improvement of domestic animals by selective breeding. Students who intend to specialize in the genetics of farm animals should therefore obtain an adequate mathematical background for the study of modern statistical methods.

**Poultry Husbandry.**—Courses in this major present the applications of scientific knowledge to commercial poultry production. Special emphasis is placed upon the methods of poultry husbandry practiced in California and other western states.

The introductory course consists of a survey of the poultry industry in the United States, including the application of the several sciences which contribute methods used in poultry husbandry. Laboratory instruction deals with the biology of the fowl, culling and selection, poultry products, and flock management. Advanced courses in the application of genetics, physiology, biochemistry, and embryology to poultry production provide a review of knowledge regarding successful methods of breeding, feeding, and incubation, as well as the basis for the experimental solution of problems in these fields. Special studies are designed to be taken by advanced undergraduates or graduates and provide opportunities to become acquainted with experimental methods; they involve work dealing with some form of poultry or poultry products elected by the student.

This major prepares students for commercial chicken and turkey farming, for service or production work with poultry breeders, hatcheries, and feed manufacturing firms, and for positions with organizations dealing with poultry products or supplies. Students with good scholarship and sound fundamental training are eligible for employment in federal, state, or commercial experimental work, and in agricultural extension services. Excellent opportunities exist for men in graduate study in fields related to poultry husbandry.

#### Curriculum in Animal Science

(a) Required:	Units
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

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67

(b) In addition, students must complete a minimum of 12 units of upper division work in one of the following departments, or in a closely related department, selected with the approval of the major adviser: animal husbandry, poultry husbandry, and genetics.

Certain courses are required by the following majors:

**Animal Husbandry:** Animal Husbandry 7, 8, 103, and 110. Animal Husbandry 103 satisfies the animal nutrition requirement, and 101 or Poultry Husbandry 106 may be counted as part of the 16 chemistry units required

of all students. Chemistry 1A, 1B, and 8 are also included in these 16 units. All animal husbandry majors must take either Animal Husbandry 108 or 118 and one other organized production course. Students in this major must spend the last two semesters (before the degree) in residence as bona fide animal husbandry majors.

*Genetics:* Chemistry 1A, 1B, 8; Botany 1; Zoölogy 1A, 1B, 100; Physiology 1, 1L. Recommended: Mathematics 3A, 3B, 105; German 1, 2.

*Poultry Husbandry:* Majors in this subject are required to take Poultry Husbandry 1. Animal Husbandry 101 should be taken as part of the curricular requirements in biochemistry. Poultry Husbandry 104 will satisfy the animal nutrition requirement. Zoölogy 100A and 100C, or an equivalent course in embryology, are also required.

#### Example of Animal Science Program

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Zoölogy 1A-1B	4	4	Chemistry 8	3	..
Chemistry 1A-1B	5	5	Animal Husbandry 101	..	3
English 1A	3	..	Bacteriology 2	4	..
Economics 1A	..	3	Economics 1B	..	3
Animal Husbandry 7, 8, Poultry Husbandry 1, or elective	4 or 3	..	Geology 1	3	..
English 1B, or elective	..	3	Physics 2A-2B	3	3
			Botany 1	..	5
			Zoölogy 100A	2	..
	<hr/>	<hr/>		<hr/>	<hr/>
	18 or 17	17		17	16

#### ENTOMOLOGY AND PARASITOLOGY

The curriculum in this department is organized to furnish the basic training for students planning to make a career of one of the phases of entomology and parasitology, and to serve the needs of students in the general fields of biology and agriculture. The fundamental background is intended for those individuals planning to engage in research, teaching, public service, or in one of the many commercial fields of the numerous phases of entomology and parasitology. Careers are open for graduates of the four-year curriculum with private, municipal, county, state, and federal agencies employing entomologists and quarantine officers, inspectors, and technicians; and as pest control operators. Professional positions on the higher levels in college teaching and in experiment station work, as well as research with commercial organizations, usually require additional training. Such training, with special emphasis in one or more of the fields of entomology and parasitology, may be obtained in a minimum of from one to two years of graduate study leading to a higher degree. (See ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.)

The several principal fields of entomology offered, with the material covered in each field, are as follows:

*Agricultural Entomology.*—The study of insects and related arthropods which attack agricultural crops, their life histories, mode of injury, economics, distribution, and methods of control.

*Systematic Entomology.*—The field dealing with the phylogeny, classification, nomenclature, and identification of insects.

*Apiculture or Beekeeping.*—A study of the life history, practical handling, and the agricultural importance of the honeybee.

The courses offered give the student a general training in the subject. Corollary courses in other departments, such as weed and plant disease control, enable the student to fit himself for practical agricultural work in these fields.

**Curriculum in Entomology and Parasitology**

(a) Required:	Units
Chemistry .....	13
Agriculture and/or forestry, other than entomology and parasitology .....	6
Botany and zoölogy .....	20
Bacteriology .....	4
Mathematics* and/or physics .....	6
English and/or speech .....	6
Genetics .....	3
Plant or animal physiology or nutrition or biochemistry .....	3
Plant or animal pathology .....	4
Geography, geology, or paleontology .....	3
	68

(b) In addition to the above, every student shall complete a summer practice course in entomology and parasitology (course 49).

(c) In addition to (b) above, students must complete at least 23 units of courses in entomology and parasitology. (Courses 100, 106, 112, and 127 should be included.)

**Example of Entomology and Parasitology Program**

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science .....	2	2	Military Science .....	2	2
Chemistry 1A-1B .....	5	5	Entomology 100 .....	..	4
English 1A-1B .....	3	3	Chemistry 8 .....	3	..
Zoölogy 1A-1B .....	4	4	Bacteriology 2 .....	4	..
† Elective .....	3	3	Physics 2A-2B .....	3	3
			Botany 1 .....	..	5
			† Elective .....	3	3
	17	17		15	17

**FOOD SCIENCE**

The curriculum in food science is intended to prepare students for service and leadership in the food processing industries—dairy industry, enology, and food technology (including plant and animal products). The courses include the physical and biological sciences with English and economics in a general requirement of at least 62 units, as mentioned below, followed by intensive specialization in the upper division work between and within the majors involved.

Several lines of specialization are open to the student. Graduates are fitted for careers in plant operation and the handling of milk, fresh fruits or vegetables intended for processing, animal products, in chemical research and control, or in the economic and business side of the food-processing industries. Many graduates are engaged in creameries, wineries, breweries, canneries, freezing plants, dried fruit packing plants, and other food plants. Some have followed the plant operation, managerial, or sales phases of the food industries. Others are engaged in research or teaching in various universities and experiment stations and in federal government research and food-inspection laboratories. A student may also undertake graduate work to fit him more particularly for one of these fields.

\* Analytic geometry and calculus, statistics, or biometry.

† Recommended electives: Agronomy 1, Animal Husbandry 7, Vegetable Crops 1, Agricultural Engineering 12, or Geology 1.

### Majors

No formal subdivisions have been made in the curriculum; but with the approval and advice of his faculty adviser, a student may plan a curriculum leading to specialization in one of the following majors:

**Dairy Industry.**—Instruction in this major is offered in the principles and art of manufacturing dairy products for the student who wishes to enter dairy manufacturing; 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 with additional graduate work, a technician, or a research worker in an agricultural college.

The facilities of the Department of Dairy Industry consist of a modern dairy plant, with the latest types of equipment for dairy products manufacturing, and chemical, bacteriological, and testing laboratories. The dairy manufacturing is in daily operation: market milk is pasteurized, and butter, cheese, ice cream, condensed milk, and dried milk are processed regularly. This provides excellent opportunities for student instruction. Courses in dairy cattle production are given by the Department of Animal Husbandry, which maintains a well-equipped dairy barn and a herd representing the principal breeds of dairy animals.

**Enology.**—The Department of Viticulture offers facilities for undergraduate and graduate work in enology. A vineyard of over 1,000 named varieties of wine grapes is maintained for instruction and research. The Enology Building, designed for teaching and investigation, provides chemical and microbiological laboratories, fermentation and conditioning rooms, distilling equipment, and storage and aging cellars for research on wines and brandies. Classroom instruction is supplemented by cellar practice.

Students primarily interested in grape and raisin production will normally major in viticulture under plant science.

**Food Technology.**—The laboratories and facilities of this department afford opportunity for instruction and research in the application of chemistry, physics, and biology to the manufacture, utilization, and preservation of foods. Typical fields of advanced study include the biological and chemical factors involved in the preparation and preservation of canned, dried, and frozen foods; enzyme behavior and control; foreign chemicals in food products; behavior and properties of the pigments of foods; the properties of and the utilization of yeasts, molds, and bacteria; influence of maturity, variety, and cultural conditions on the quality of processed fruits and vegetables; factors influencing acceptability of foods as evaluated by taste panel; development of new food products; and food plant sanitation.

Graduate instruction may be taken either at Davis or Berkeley, depending upon the student's interests.

### Curriculum in Food Science

(a) Required:	Units
Chemistry .....	10
Microbiology .....	8
Botany or zoölogy .....	5 or 3
Physics (including laboratory) .....	8
Biochemistry and/or physiology .....	6
Mathematics (including differential calculus) .....	6
Speech and/or English .....	6
Economics .....	6

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

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

Certain courses are required by the following majors:

*Dairy Industry*: Animal Husbandry 103, and 108; Chemistry 1A, 1B, 5, and 8; Dairy Industry 1, 2, 49 (or equivalent practical experience), 160A, and 160B.

*Enology*: Agricultural Engineering 102; Botany 1 and 7; Chemistry 1A, 1B, 5, 8, and 101 (or 109); Viticulture 1, 105, 116, 117, 124, 125, and 140.

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

**Example of Food Science Program**

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science .....	2	2	Military Science .....	2	2
Chemistry 1A-1B .....	5	5	Physics 2A-2B .....	3	3
Botany 1 or Dairy Industry 1 and 2 .....	5 or 4	..	Physics 3A-3B .....	1	1
Mathematics 11A-11B ...	3	3	Chemistry 5 .....	3	..
*Zoölogy 10 or elective ..	..	3	Chemistry 8 .....	3	..
English 1A-1B .....	3	3	Bacteriology 1 .....	..	5
			Economics 1A-1B .....	3	3
			Elective .....	..	3
	18 or 17	16		15	17

**HOME ECONOMICS**

The Department of Home Economics was organized to serve the interests of the family. Its curriculum is designed to serve a two-fold purpose: to afford a liberal and balanced preparation for teachers of home economics, extension workers, and homemakers; and to provide specialized training for the professional fields which have developed out of general home economics. These purposes are served by the major in general home economics. Five other majors, including general home economics—child development, clothing and textiles, family economics, food chemistry and technology, and nutrition and dietetics are available on the Berkeley campus.

**Curriculum in Home Economics**

(a) Required:	Units
Chemistry .....	8
Economics .....	6
Psychology .....	3
Bacteriology (including laboratory) .....	4
Physiology .....	3
Public health, botany, or zoölogy .....	3
English or speech .....	6
Statistics .....	3
	<hr/> 36

(b) In addition, 36 units of upper division work distributed among the allied fields of home economics and chosen with the approval of the major adviser. (This requirement is ordinarily satisfied chiefly by upper division courses in home economics.)

\* Dairy Industry students only.

The following courses are required for the General Home Economics major: \* Home Economics 1A, 1B, 6, 7, 112A, 112B, 132, 133, 134, 140, 141 (or 142), 144, 150, 162, 175; Decorative Art 6A, 6B, 130A (or Home Economics 152). For the teaching credential, 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 "Requirements for Teaching Credentials," page 91.

#### Example of General Home Economics Program

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Chemistry 1A, 8.....	5	3	Home Economics 7, 6.....	3	3
English 1A-1B.....	3	3	Economics 1A-1B.....	3	3
Home Economics 12.....	2	..	Bacteriology 2.....	4	..
Decorative Art 6A-6B.....	2	2	Mathematics 13.....	..	3
Psychology 1A.....	3	..	Physiology 1.....	3	..
Elective.....	..	8	History 17B.....	..	3
			Zoology 10.....	..	3
			Elective.....	3	..
	15	16		16	15

#### IRRIGATION SCIENCE

The irrigation science curriculum is designed to give students a broad training in the fundamentals of irrigation. The success of almost all forms of agricultural development in arid or semi-arid regions depends largely upon irrigation. This curriculum is intended to meet the needs of those desiring to engage in irrigated farming as well as of those undertaking research and teaching, service with public agencies, or the management of irrigation enterprises.

Training is provided in the agricultural phases of irrigation. Consideration is given to the plant-soil-water system and to the engineering problems related to the supply, distribution, and the measurement of water. The major includes courses in mathematics, chemistry, and physics, together with basic courses in botany, soil science and other fields which are necessary for a thorough understanding of the principles of irrigation. Undergraduate instruction covers water supply, water rights, water quality and salinity, land preparation and irrigation systems, drainage, the use of irrigation water, organization of irrigation enterprises, and the principles underlying irrigation in its soil and plant relationships. Advanced instruction is offered in hydrology, irrigation hydraulics, soil moisture, the moisture relations of plants, and other phases of irrigation.

Laboratory facilities are available, including indoor and outdoor hydraulic installations and equipment for studies of plant-soil-water relations. The more than 2,000 acres of irrigated land which comprises the University Farm afford an opportunity to study many types of irrigation systems serving a diversity of crops.

Graduates in this curriculum are prepared to become managers, hydrographers, and water masters of irrigation districts and water companies; managers of large farm enterprises or operators of individually owned farms; instructors and scientists in schools, universities, and experiment stations; and workers in agricultural extension services and in other state or federal agencies dealing with the supply, use, control, and conservation of water. A number of commercial opportunities are available with irrigation equipment companies and as irrigation consultants.

\* See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE for details concerning the five other majors.

**Curriculum in Irrigation Science\***

(a) Required:	<i>Units</i>
Mathematics (including integral calculus) .....	6
Chemistry .....	16
Physics (including laboratory) .....	8
Botany (including plant physiology) .....	9
Engineering (surveying) .....	3
Bacteriology .....	4
Economics .....	3
Geology .....	3
English and/or speech .....	6
Soils .....	8
	66

(b) In addition, students must take at least 24 units in irrigation to be selected with the approval of the major adviser.

(c) In addition to the above, students must take 3 units in agricultural engineering dealing with agricultural power.

**Example of Irrigation Science Program**

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science .....	2	2	Military Science .....	2	2
Botany 1 .....	5	..	Physics 2A-2B .....	3	3
Chemistry 1A-1B .....	5	5	Physics 3A-3B .....	1	1
Geology 1 .....	..	3	Chemistry 5 .....	3	..
English 1A-1B .....	3	3	Mathematics 8A-8B .....	3	3
Economics 1A .....	..	3	Engineering 1A .....	3	..
	15	16	Elective .....	..	6
				15	15

**PLANT SCIENCE**

The plant science curriculum is designed to turn out well-trained men and women in plant production, including the handling and certain phases of the processing of plant products, and also to lay a good foundation for future specialization in graduate study. The course includes the physical and biological sciences, with English and economics, in a general requirement of 65 units as listed on page 62.

A wide range of specialization is offered in the upper division work between and within the majors involved, including agronomy, genetics, landscape management, plant pathology, pomology, vegetable crops and viticulture.

Graduates are fitted to enter a variety of occupations in the production and technical fields, as well as in general farming. A few examples of such positions are those of managers of orchards, vineyards, and farms producing field or vegetable crops; field representatives for commercial organizations and marketing associations; salesmen for concerns handling agricultural equipment and chemicals; plant breeders; agriculture teachers in high schools or junior colleges (with additional graduate work); employees of federal, state, and other governmental agencies; and laboratory and field technicians in public service and in commercial laboratories.

\* Mechanical drawing is required and should be taken in high school, or through University Extension.



*Graduate Work*

The student may pursue graduate work leading to the degree of Master of Science on the Davis campus in the following plant science fields: agronomy, genetics, horticulture (pomology, viticulture), plant pathology, and vegetable crops.

Students may prepare for a research career in plant science by seeking a doctorate in agricultural chemistry, botany, comparative biochemistry, genetics, plant pathology, plant physiology, or soil science.

Students contemplating graduate work in plant science should familiarize themselves with the requirements for higher degrees. (See ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.) They are strongly advised to include appropriate basic courses, such as languages and mathematics, in their undergraduate programs.

**Majors**

*Agronomy.*—Instruction is given in the underlying principles and practices of the production, processing, and utilization of field crops, which include cereals, beans, oil, fiber, cultivated forages, and range, green manure, and cover crops.

Upper division work is concerned with the relationships of environment, crop distribution, varietal adaptation, soil fertility and soil management to crop production. Factors determining quality and value as well as the processes of manufacturing crop products are considered. The principles of crop improvement and the value of pure seed are stressed.

The major is flexible enough to allow the student to prepare for farming, commercial work, positions with government agencies, or for graduate study.

The Department of Agronomy offers graduate instruction leading to the degree of Master of Science. Problems related to agronomy leading to the degree of Doctor of Philosophy may be undertaken under the supervision and in the laboratories of agronomy staff members in the fields of agricultural chemistry, comparative biochemistry, genetics, plant physiology, and soil science.

Ample field, laboratory, and greenhouse facilities are available for research with field crops. Problems suitable for graduate students include investigations in genetics and plant breeding as related to the improvement of bean, cereal, fiber, forage, oil, and other field crops; physiological and chemical problems of crops as related to factors such as light, heat, drought, and disease resistance; crop and soil inter-relations with special reference to legumes, crop residues, enzymes, and crop sequences.

*Genetics.*—It is possible to arrange various combinations of courses so as to complete an undergraduate major in genetics. Such a major must include general genetics and either plant or animal cytology; it may include plant breeding, fruit breeding, vegetable breeding, organic evolution, theory of probability, or statistics.

Prospective students should study general botany and zoölogy, followed by either plant or animal morphology, anatomy, physiology, and taxonomy. Students intending to specialize in statistics as a genetic tool should have at least one semester of calculus.

*Landscape Management.*—This major is designed to train the student in the basic knowledge of the culture and management of plants for landscape use as well as the construction materials and their uses in the landscape.

In addition the major offers a variety of supplementary courses which will train a student for specific interests in the field. By proper selection of courses in other fields, majors in Landscape Management can prepare themselves for

careers in landscape management, turf management, the production and distribution of ornamental plants.

Facilities planned for this department include extensive outdoor growing areas, greenhouses, lathhouses, laboratories and workshops, and controlled environmental rooms and storage facilities for flowers, bulbs, and plants. Specific problems of advanced study in landscape management can be arranged with other departments.

Although the fundamentals of landscape design are covered in the course of instruction it is not intended that this curriculum will prepare students for a career in landscape architecture.

*Plant Pathology.*—The upper division courses afford instruction in the different types of plant diseases and the principles and techniques of plant pathology.

Those desiring to go into professional work involving teaching or research ordinarily take several years of graduate work after attaining the bachelor's degree. For such students the following courses are recommended: botany (taxonomy, anatomy, cytology, physiology, and mycology), bacteriology, entomology, genetics, chemistry (quantitative, organic, and biochemistry), physics, soils, zoology, French, and German.

*Pomology.*—This major deals with the principles and practices involved in the production of all deciduous tree fruits, nuts, bushberries, strawberries, and olives.

Upper division lecture and laboratory instruction is directed toward the evaluation and integration of such orchard operations as pruning, fruit thinning, spraying, fertilization, irrigation, and cultivation and their influence upon the ultimate quantity and quality of the fruit produced, whether fresh or processed. The effects of environment (site, soil, climate), selection of varieties and root-stocks, use of plant growth regulators, propagation methods, attention to the need of cross-pollination facilities, and experimental techniques are some of the subjects studied in relation to fruit production. The principles involved in fruit handling including harvesting, packaging, pre-cooling and storage are stressed.

The major is flexible enough to permit the student to prepare for fruit growing as a vocation either independently or as a superintendent for others, or for a position as field representative of a fertilizer or spray company, an employee of a federal or state governmental agency, or for graduate study.

The Department of Pomology offers graduate instruction for the degree of Master of Science in Horticulture. Also problems related to horticulture and leading to the degree of Doctor of Philosophy may be studied under the supervision of pomology staff members in such fields as botany, plant physiology, genetics, soil science, and comparative biochemistry.

Facilities available for both undergraduate and graduate studies include well-equipped laboratories and cold storage rooms, greenhouse and lathhouse space, and fruit variety and species collections including more than 20 species and 1,000 named varieties. Orchards totaling over 300 acres of the major California fruit crops are maintained under irrigation and are used for research and instruction.

Problems suitable for graduate students include studies on such varied subjects as the genetics and techniques of fruit breeding, the chemistry of fruit maturation, factors influencing flower formation and fruit setting, and the mineral nutrition of fruit crops.

*Vegetable Crops.*—This major deals with all the various aspects of the production, harvesting, and distribution of the many important California vegetables.

The upper division lecture and laboratory studies are concerned with the principles and practices of plant production, soil management, transplanting, fertilization, irrigation and weed control in their effects on yield and quality. Seed production, variety adaptation, soil and climate as factors in vegetable production, special cultural techniques, development of new varieties, mechanical harvesting, and post-harvest handling for fresh market, canning, or freezing are considered. Flexibility is provided by the various courses of the major so as to prepare students for vegetable farming, employment with seed, fertilizer, shipping and processing companies, graduate study, or positions in governmental agencies. Courses in allied fields may be used to broaden the vegetable production option.

The Master of Science degree is offered by the department. Work for the degree of Doctor of Philosophy may be taken under staff members of the Vegetable Crops Department on a problem related to vegetable production in any one of six fields of concentration: agricultural chemistry, comparative biochemistry, botany, genetics, plant physiology, and soil science.

The department is equipped with excellent chemical, physiological, and morphological laboratories, greenhouses, lathhouse, specially constructed bulb-storage house, cold storage facilities, and 140 acres of land with a complete irrigation system for studies on the problems of this major California industry.

*Viticulture.*—This major comprises the study of the grapevine and its products. Teaching and investigation are directed toward the improvement of the production and quality of table grapes, wines, raisins, and other products of the grape.

Upper division instruction includes such cultural operations as pruning, thinning, girdling, fertilization, and cultivation. Methods of propagating the vine, the breeding and testing of new varieties, insect and disease control, and the use of growth-regulators are part of the course work. The basic importance of soil, climatic conditions and variety is emphasized in relation to the yield and quality of the fruit and its products.

The world's most complete collection of cultivated grape varieties, native species and hybrids, is maintained for instruction and research. A vineyard of 95 acres supplies fruit of the important varieties for studies on packing, pre-cooling, and storage. Laboratories, greenhouse space, and a field house provide facilities for the growing and handling of the vine and its fruit.

Graduate instruction leading to the degree of Master of Science in Horticulture is offered by the Department of Viticulture. Problems related to viticulture and leading to the degree of Doctor of Philosophy may be studied under the supervision of viticulture staff members in such fields as genetics, cytology, plant physiology, or soil science.

#### Curriculum in Plant Science

(a) Required:	Units
Chemistry (may include biochemistry) . . . . .	16 - 13
Botany and plant physiology . . . . .	9 - 7
Physics . . . . .	6 - 4
Bacteriology . . . . .	4 - 3
Economics . . . . .	3 - 3
English and/or speech . . . . .	6 - 6
Genetics . . . . .	4 - 4
Plant pathology . . . . .	4 - 4
Geology, soils, irrigation, or plant nutrition . . . . .	6 - 6
Entomology . . . . .	4 - 4
Zoology or 3 additional units of botany or plant physiology . .	3 - 0

65

2  
75

3  
78

(b) In addition, students must complete a minimum of 12 units of upper division work in one of the following majors, or in a closely related major, selected with the approval of the major adviser; agronomy, genetics, landscape management, plant pathology, pomology, vegetable crops, and viticulture.

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

Certain courses are required by the following majors:

*Agronomy.*—Agronomy 1, Chemistry 1A, 1B, 5, 8 (or 101); Botany 1, 7; Soil Science 106, 110 (or Irrigation 110); Zoölogy 10.

*Genetics.*—Chemistry 1A, 1B, 8; Zoölogy 1A. Recommended: Mathematics 3A, 3B, 105; German 1, 2.

*Landscape Management.*—Chemistry 1A, 1B, 5, and 8; Botany 1, 7, and 108 or 120A; Landscape Management 3, 104, 105, 107; Pomology 109.

*Plant Pathology.*—Zoölogy 1A (or 10); Soil Science 110, or 106.

*Pomology.*—Chemistry 1A, 1B, 5, 8; Botany 1, 7 (or 120A, 120B, and 121A, 121B); Pomology 2. Recommended: Pomology 105, 106A, 106B, 112, 121; Agricultural Engineering 103; Irrigation 110.

*Vegetable Crops.*—Chemistry 1A, 1B, 8; Botany 1, 7; Vegetable Crops 122, 190. Botany 107, Agricultural Engineering 103, 104, and Agricultural Economics 140 may be used for upper division credit in the major.

*Viticulture.*—Chemistry 1A, 1B, 5, 8; Botany 1, 7; Viticulture 1, 105, 116. Recommended: Viticulture 124 and 125 or Pomology 112 and 121; Agricultural Engineering 103; Irrigation 110.

#### Example of Plant Science Program

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science . . . . .	2	2	Military Science . . . . .	2	2
Botany 1 . . . . .	5	..	Chemistry 5, 8 . . . . .	3	3
Chemistry 1A-1B . . . . .	5	5	Bacteriology 2 . . . . .	4	..
Economics 1A . . . . .	..	3	Botany 7 . . . . .	..	4
English 1A-1B . . . . .	3	3	Physics 2A-2B . . . . .	3	3
Zoölogy 10 . . . . .	..	3	Agronomy 1 or Pomology 2 .	3	..
			Vegetable Crops 1 or		
			Viticulture 1 . . . . .	..	3
	15	16		15	15

#### PREFORESTRY†

The School of Forestry of the University of California occupies the Forestry Building on the Berkeley campus. The School has a permanent summer camp in the Plumas National Forest where all undergraduates spend one summer in field practice work and instruction.

The preforestry work of the freshman and sophomore years is administered by the College of Agriculture, and it is possible to complete the requirements for admission to the School of Forestry.

† It is suggested that students interested in the study of forestry write to the School of Forestry, 243 Forestry Building, University of California, Berkeley 4, for the ANNOUNCEMENT OF THE SCHOOL OF FORESTRY for more detailed information.

## Curriculum in Preforestry

(a) Required:	<i>Units</i>
Botany (general botany).....	5
(This requirement is based on Botany 1 as given at Berkeley.)	
Chemistry (general inorganic and organic).....	8
Engineering (plane surveying).....	6
Economics (elements of economics).....	6
Geology (structural).....	3
Mathematics (analytic geometry and differential calculus)..	6
Physics (general physics with laboratory).....	8
Statistical methods.....	3
Zoölogy (general biology).....	3
Speech, English.....	6
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(b) For admission to the School of Forestry, a student must have junior standing with at least 60 units of credit, including essentially the prescribed subjects listed above, and a grade average of C or higher. The summer field practice course, Forestry 49, is prerequisite to all required forestry courses.

The schedule of study offers a broad basic training in the first four semesters. To complete his work for the degree of Bachelor of Science in the normal eight-semester period, the student should adhere closely to the recommended program, which follows. It enables him to complete the maximum number of lower division courses in an orderly manner and without conflicts. Much of this work is prerequisite to necessary courses in the School of Forestry, and by following the recommended program the student is prepared to make an advantageous selection of electives and a logical arrangement of requirements after his admittance to the School of Forestry.

## Example of Preforestry Program\*

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science.....	2	2	Military Science.....	2	2
Chemistry 1A, 8.....	5	3	Physics 2A-2B, 3A-3B... 4	4	4
Botany 1.....	5	..	Engineering 1A.....	3	..
English 1A-1B.....	3	3	Economics 1A-1B.....	3	3
Mathematics 13.....	..	3	Mathematics 11A-11B....	3	3
Geology 1.....	..	3	Zoölogy 10.....	..	3
Elective.....	..	3			
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## PREVETERINARY MEDICINE

The School of Veterinary Medicine offers instruction leading to the Bachelor of Science and Doctor of Veterinary Medicine degrees. Preveterinary training, however, is completed in the College of Agriculture and is designed to prepare students for further training in the School of Veterinary Medicine.

\* Trigonometry and geometrical drawing are prerequisite to Forestry 49, and should be taken in high school.

## Curriculum in Preveterinary Medicine

	<i>Units</i>
English composition and additional English or speech.....	6
Chemistry (general, inorganic, organic, and analytical).....	16
Zoölogy .....	8
Physics (mechanics, heat, light, electricity) .....	6
Restricted electives† .....	12
	48

## Example of Preveterinary Medicine Program

The following schedule of study need not be rigidly adhered to but it satisfies the requirements without conflicts. This schedule also satisfies the general requirements of the Animal Science Curriculum if Botany 1, Geology or Soils, Bacteriology 1, and Economics 1A-1B are taken as electives.

FRESHMAN YEAR			SOPHOMORE YEAR		
<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science .....	2	2	Military Science .....	2	2
English 1A .....	3	..	Chemistry 8, 5 .....	3	3
English 1B or Speech 1A ..	..	3	Physics 2A, 2B .....	3	3
Chemistry 1A, 1B .....	5	5	Electives .....	8	9
Zoölogy 1A, 1B .....	4	4			
Elective .....	3	3			
	17	17		16	17

## RANGE MANAGEMENT

The curriculum in Range Management is designed to give students broad training and to qualify them as managers of ranch properties, as farm advisors, as range technicians in state and federal agencies, and for graduate studies leading to positions in teaching and research. Range management has been growing in importance in the past few years and has made very great advancement in California. The California Agricultural Experiment Station has several research projects on the various range problems; many farm advisors are taking range management information to the ranchers; and several state and federal agencies have both research and educational programs in this field.

Approximately 37,000,000 acres, or one-third of the wild lands in California, are used to some extent for domestic livestock grazing. The actual grazing value of many of the acres is low, but collectively, they are the supporting base for California's second largest agricultural industry—livestock production. Much of this land also has values other than livestock grazing, in watershed development, timber production, recreation, and wildlife.

The varied nature of range management work, whether it be in public service or as a ranch operator, makes it desirable that a student entering this field have some training in several or all of the following fields: animal husbandry, agronomy, range management, soils, forestry, watershed management, and wildlife. For this reason, the student must spend either his third or fourth year on the Berkeley campus where he takes required courses chiefly in range management.

The first and second years of the Range Management curriculum offer a broad basic training. Since the number of courses required in the freshman

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

and sophomore years is large, students are advised to adhere closely to the program. The junior and senior years are purposely not crowded with specific required courses to make it possible for the student to exercise considerable selection in the courses he wishes. For example, if the student has a special wish to take more courses in animal husbandry, forestry, or some other field, the large space for electives will make it possible for him to do so.

#### Curriculum in Range Management

(a) Required:	<i>Units</i>
Chemistry (General Inorganic; Organic) .....	8
Zoölogy (General) .....	8
Botany (General; Plant Physiology) .....	9
English and/or Speech (Composition) and/or Elements of Speech .....	6
Geology or Soils (Structural Geology or Elements of Soil Science) .....	3 or 4
Engineering (Plane Surveying) .....	3
Physics (Mechanics; Heat; Light; Electricity) .....	6
Economics (Principles) or Economics (Principles) and Agricultural Economics .....	6
Animal Husbandry (Judging; Feeds and Feeding; Management; Meat Production) .....	10
Agronomy (Crop Production; Forage Crops; Range Plants)	9
Forestry (Range Management; Forest Ecology; Range Techniques; Range Utilization; Grassland Ecology) .....	12
Soils (Medium for Plant Growth) .....	4
	84 or 85

(b) In addition to the above required courses the student must elect at least 15 units from the following list of restricted electives.

	Fall <i>Units</i>	Spring <i>Units</i>
Agricultural Economics 145 (Land Economics) .....	..	3
Agricultural Economics 140 (Farm Management) .....	3	..
Animal Husbandry 7 (Introduction to Animal Husbandry) .....	3	..
Animal Husbandry 101 (Animal Biochemistry) or Biochemistry 102 (Principles of Biochemistry) .....	..	3
Animal Husbandry 117 (Physiology of Reproduction) .....	..	3
Animal Husbandry 110 (Physiology of Domestic Animals) .....	5	..
Botany 8 (Poisonous Plants) .....	..	2
Botany 107 (Weed Control) .....	..	4
*Botany 108 (Taxonomy of Seed Plants) .....	..	4
Economics 2 (Economic Statistics) or Math. 13 (Elementary Statistics) .....	3	or 3
Forestry 104 (Silviculture) .....	4	..
Forestry 125 (Forest Influences) .....	3	..
Forestry 132 (Forest Photogrammetry) .....	..	3
Genetics 100 (Principles of Genetics) .....	3	or 3
Genetics 100C (Genetics Laboratory) .....	1	or 1

\* Should be elected by students who wish to meet United States Civil Service requirements.

Irrigation 125 (Water Supply and Surface Hydrology) .....	4	..
Soils 100 (Soil Characteristics) .....	4	..
Soils 101 (Soil Morphology and Development) .....	..	3
Soils 101F (Soil Morphology and Development, Lab.) ..	..	1
Zoölogy 116 (Economics of Vertebrate Zoölogy)		
Davis or Zoölogy 116 (Wildlife Management)		
Berkeley .....	3 or 4	
Zoölogy 125 (Animal Ecology) .....	..	3

(c) In addition Forestry 49R, a summer field course of six weeks in applied range management is required without units of credit. This comes at the end of the sophomore year and during the six weeks of the first regular summer session at the University. Students should send application for the summer field course to the Administrative Assistant, 243 Forestry Building, University of California, Berkeley 4, by March 1 of the year of enrollment. The first two weeks of the summer course will be devoted to textbook and library work in Berkeley and the other four weeks will be a field trip covering range areas throughout the State.

#### Example of Range Management Program

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science .....	2	2	Military Science .....	2	2
English 1A-1B .....	3	3	Botany 7 .....	..	4
Chemistry 1A, 8 .....	5	3	Economics 1A-1B .....	3	3†
Zoölogy 1A-1B .....	4	4	Engineering 1A .....	3	..
Botany .....	..	5	Soils 106 .....	..	4
Elective .....	3	..	Physics 2A-2B .....	3	3
			Electives .....	6	..
	17	17		17	16

#### The Professional Courses‡ are Listed as Follows:

JUNIOR YEAR—DAVIS		
	Fall Units	Spring Units
Animal Husbandry 103 (Feeds and Feeding) .....	3	..
Animal Husbandry 8 (Livestock Judging) .....	1	..
Animal Husbandry 104A and 104B (Livestock Management) .....	1	1
Animal Husbandry 118 (Meat Production) .....	..	4
Agronomy 110 (Principles of Crop Production) .....	3	..
Agronomy 112 (Forage Crops) .....	..	3
Agronomy 115 (Range Plants) .....	..	3
	8	11

SENIOR YEAR—BERKELEY		
	Fall Units	Spring Units
Forestry 103 (Principles of Ecology) .....	3	..
Forestry 133 (Grassland Ecology) .....	..	3
Forestry 102 (Range Techniques) .....	..	3
Forestry 123 (Range Utilization) .....	3	..
Soil Science 110 (The Soil as a Medium for Plant Growth) .....	4	..
	10	6

† A course in Agricultural Economics may be substituted for Economics 1B.

‡ Courses listed for junior year may be taken in senior year and vice versa.



## SOIL SCIENCE

The soil science curriculum provides training for laboratory and field research and for professional employment in soil surveying, soil conservation, extension work in soils, soil advisory work in ranch and farm planning and management, soil fertility experimentation, and in land appraisal and utilization. Many graduates are employed by agencies of the federal or state governments. Opportunities for employment as soil fertility specialists are also frequently available with large agricultural corporations.

Graduate study leading to the degree of Doctor of Philosophy in Soil Science is offered to qualified students. This degree is usually required for employment in advanced research and university teaching.

Since soil science is a profession, a basic education in the subject, rather than a study of applied phases, is emphasized. The field of soil science is concerned with several aspects of soils. The chemical and physical properties of soils are studied. In particular, the nature of soil clays, the function of organic matter, and the behavior of water in the soil are stressed. The functions of microorganisms in the soil constitute an important topic. Pedology is a branch of soil science which deals with the origin and characteristics of natural soils in the field. Finally, emphasis is given to a study of the means by which plants obtain their nutrients from the soil.

The upper division portion of the four-year program is offered only at Berkeley. Thus, students must be prepared to reside in Berkeley during the last two years of their program; and to graduate from that campus. Junior and state college students are advised to obtain information regarding the opportunity for continued instruction before applying for admission to any campus other than the Berkeley campus.

For those students who can continue for one or more years at Davis, courses in applied agricultural science may be profitably taken as electives. The location of the Davis campus in an important agricultural region offers to the alert student an opportunity for observation of agricultural practices.

## Curriculum in Soil Science

(a) Required:	Units
Mathematics (analytic geometry and calculus).....	6
Chemistry (including physical chemistry).....	19
Physics (including laboratory).....	8
Botany (including plant physiology).....	9
Plant Nutrition .....	2
Bacteriology .....	4
Mineralogy .....	4
Geology (including petrology).....	6
Economics or, economics and agricultural economics.....	6
English and/or speech.....	6
	70

(b) In addition, students must take at least 24 units in soil science, to be selected with the approval of the major adviser.

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

## Example of Soil Science Program

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science .....	2	2	Military Science .....	2	2
English 1A-1B .....	3	3	Chemistry 5, 8 .....	3	3
Botany 1 .....	5	5	Economics 1A-1B .....	3	3
Chemistry 1A-1B .....	5	5	Bacteriology 2 .....	4	..
Mathematics 11A-11B .....	3	3	Geology 1 .....	..	3
Elective .....	3	..	Physics 2A-2B .....	3	3
			Physics 3A-3B .....	1	1
	<hr/>	<hr/>		<hr/>	<hr/>
	16	18		16	16

## COLLEGE OF LETTERS AND SCIENCE (DAVIS)

THE FIRST TWO YEARS in the College of Letters and Science constitute the lower division. During this period the student should fulfill the prerequisites for his major work and should seek to establish a basis for broad culture and sound judgment. The requirements of the first two years, designed for these purposes, are given in detail below. The degree of Associate in Arts is awarded when the student has completed these requirements with at least a C average, a year's residence in this University, and the final semester in residence in this College. Many persons find that two years of general education are sufficient preparation for their subsequent life activities.

The upper division, consisting of the third and fourth years, is a period of more advanced study and limited specialization. For admission to the upper division, a student must either (a) have received the Associate in Arts degree in the College of Letters and Science at Berkeley, Davis, or Los Angeles, or (b) have fulfilled, in this University or elsewhere, the requirements for admission to the upper division set forth below.

About half of an upper division student's time is devoted to advanced study in some particular field, called the major, usually a program of related courses set up by one department. Certain combinations chosen from more than one department are known as group majors. The major or group major completed is stated on the diploma.

The College of Letters and Science aims to provide an education whose value is not limited by possible vocational use. In this respect it differs from a purely technical college. For example, a major in English might lead ultimately to a professorship in English; but its value would not disappear if the person should enter 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 any inquiring mind.

To safeguard this character of instruction in the College, there has been set up a Letters and Science List of Courses, from which the student must choose nearly all his electives.

The maintenance of a B average (or better) secures valuable privileges, especially in the upper division, where this standing qualifies one as an honor student.

After 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.*—At registration every lower division student will report to a faculty adviser, by whom his study list must be approved. A special adviser is provided for each student who contemplates a major not offered on the Davis campus. The study list may total 12 units or more a semester without special permission in respect to quantity of work; but the maximum is 16 units for a freshman and for a transfer student in his first semester of residence at this University. Any request to take fewer than 12 units must be approved by the Dean of the College.

In addition to these study-list limits, two lower division courses in physical education, with degree credit totaling not more than 1 unit, may be included in a student's program in any semester or session. Not more than 4 units of credit in physical education may be counted toward graduation.

A lower division student may seek advice from his proposed major department or committee.

*Advisers for Students Entering with Advanced Standing.*—A lower division student transferring into the College of Letters and Science will report to a

faculty adviser; an upper division transfer student must consult the adviser for his major. Any transfer student who has problems unrelated to the major should consult the Dean of the College.

*Upper Division.*—Each upper division student must designate his major or group major on his study list. He must register with his major department or with the committee in charge of his group major. His study list must be approved (in relation to his major program) by a representative of the major department or of the group major committee.

If a student in the lower division fails to complete the preparation for a major, both in subjects and grades, he may, at the option of the department, be denied the privilege of majoring in the subject concerned.

The major may be changed only by permission of the Dean of the College, and of the department to which the student petitions to transfer. When the change has been authorized, the Registrar will notify the departments concerned.

Every student must complete at least 6 units in his major during the last or senior year: either 3 units each semester, or 2 units in one semester and 4 units in the other.

A student who enters as a senior in the College of Letters and Science after attending another college of this University, or another collegiate institution, must complete at least 24 units, including 18 units in upper division Letters and Science courses, of which at least 12 units will normally be in his major department or group major in this University.

*Status of Courses in Professional Curricula.*—The first year of certain designated professional curricula (for example, in the School of Medicine) is accepted as a year's work toward the A.B. degree. If this substitute is offered for a major in Letters and Science, all the courses required or included as part of the student's program in that curriculum become requirements for the degree.

### Degree of Associate in Arts

The degree of Associate in Arts will be granted when the candidate has satisfied the following requirements:

1. Completion of not less than 60 units which may be counted toward the A.B. degree, with an average grade of at least C in all courses undertaken in this University.
2. Completion of requirements (a) to (e) inclusive, below.
3. Completion of at least the two final semesters (24 units or more) in residence at this University, and at least the final semester in the College of Letters and Science.

Honorable mention with the degree of Associate in Arts will be granted a student who attains an average grade of B or better for all units undertaken. The list of students who receive honorable mention with the degree of Associate in Arts will be sent to the chairmen or advisers 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.

### Admission to the Upper Division

To be admitted to the upper division of the College of Letters and Science, the student (1) must have completed at least 60 units of college work with a grade-point average of not less than 1.00 (a C average) in all work done in the University and (2) must have satisfied the following general and specific requirements: (a), (c), and (d) as shown below; 12 units of foreign languages under (b); and at least three of the four sequences under (e). However, requirements (a) to (e) inclusive must be completed before graduation.

A student who transfers to the Davis campus of the University after having completed the requirements for upper division standing in the College of Letters and Science at Berkeley or Los Angeles shall be admitted to the upper division in this College. A student transferring from another college of this University or from another collegiate institution must meet the requirements for admission to the upper division, but will not be held strictly to the time distribution of requirements, provided the credit allowed him in the College of Letters and Science at this University totals 60 units or more.

Certain of the requirements listed below may be satisfied by courses taken in the high school. The satisfaction of requirements in the high school does not, however, reduce the amount of work required in this University for the degree of Associate in Arts (60 units) or for the A.B. degree (120 units).

General and specific requirements for admission to the upper division are as follows:

(a) *General University Requirements:*

Subject A.

Military Science and Tactics, 8 units, 4 semesters (men).

(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. 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, including 2 units (6 semester hours) of laboratory, chosen from the following list:

High school physics\*, 3 units (1 high school credit).

High school chemistry\*, 3 units (1 high school credit).

Bacteriology 1\*, 2\*.

Botany 1\*, 7, 14\*, 16\*.

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

Geology 1, 3.

Physics 2A, 2B, 3A-3B†, 4A-4B-4C†.

Physiology 1, 1L\*.

Zoology 1A\*, 1B\*, 10.

(e) *Additional:* A sequence (of 4 to 6 units) in subjects of college level in each of four of the following six groups:

**YEAR COURSES IN FULFILLMENT OF REQUIREMENT (e) ABOVE**

**Group 1—English and Speech**

English 1A-1B.

**Group 2—Foreign Languages**

In addition to (b) above, one college course of not less than 4 units. Classics. Greek 1A-1B; Latin 1, 2. Two years of high school Latin are accepted as satisfying this requirement.

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

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

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

\* Will be accepted as fulfilling the laboratory requirement.

† Two courses satisfy the laboratory requirement.

**Group 3—Mathematics**

Any two of the following courses: C or high school trigonometry, 3A or 11A, 3B or 11B, 8, 9, 10, 13.

**Group 4—Social Sciences**

Economics 1A–1B.  
 \*Geography 1 and 2.  
 History 4A–4B, 17A–17B.  
 Political Science 1 and 2.  
 Psychology 1A and 1B or 33.  
 Sociology 1 and 2.

**Group 5—Philosophy**

Philosophy 6A–6B.  
 Philosophy 20A–20B.

**Group 6—Fine Arts and Literature**

This may be satisfied by two or more courses which may or may not form a sequence.

Art 1A, 1B, 1C, 1D, 10.  
 Classics 34, 35.  
 English 44A, 44B, 46A, 46B.  
 Music 21A, 21B, 27A, 27B.  
 Speech 2A.

*Summer Session courses.*—A student who desires 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.

*University Extension courses.*—Requirements (b), (c), (d), and (e) may be met in whole or in part by the completion of acceptable courses in University Extension. For a list of such courses, see the announcements of University Extension. Any student intending to use Extension courses for satisfying the requirements set forth above should first secure written approval from the Dean of the College of Letters and Science, Davis.

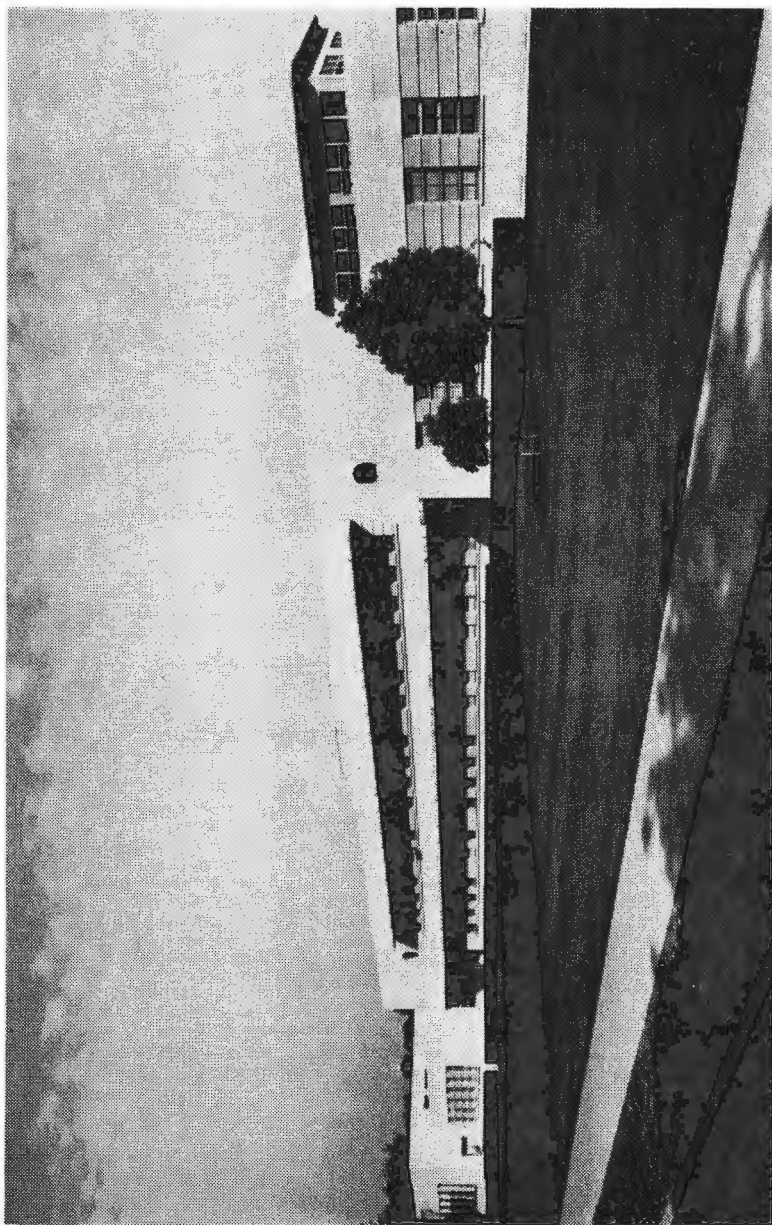
**Requirements in the Upper Division**

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. 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 received 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 called 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 1.5 or better in the work undertaken during the junior and senior years.)

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



The Chemistry Building

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

4. The requirement of American History and Institutions must be completed by all candidates for the bachelor's degree. A student may complete this requirement in any one of the following four ways:

(a) by passing a single examination, for which no unit credit will be assigned;

(b) by completing certain courses;

(c) by presenting an official transcript from a collegiate institution in California, stating that the requirement has been fully satisfied there by courses taken;

(d) by presenting a certificate of completion of acceptable courses at another collegiate institution.

5. At least 36 units chosen from the upper division courses named in the *Letters and Science List* (see page 79), with the exceptions there noted, must be completed after the student has attained upper division standing.

6. The student must complete a major of at least 24 upper division units according to the specifications given below.

7. Any candidate for the A.B. degree who enters the College of Letters and Science with senior standing, after attending another college of this University, or another collegiate institution, is required to be enrolled during the senior or final year in resident courses of instruction at this University in the College of Letters and Science. During this period the student must complete at least 24 units, including at least 18 units in upper division courses, of which normally 12 units must be in the major. He may offer two University of California summer sessions as equivalent to one semester; but, in any event, he must complete in resident instruction at least one regular semester of his senior year.

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

### Majors for the A.B. Degree

A major consists of a substantial group of coordinated upper division courses, representing one or more departments of the College. If one year of an acceptable professional curriculum, for example the first year of the School of Medicine, 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.

A major 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, a student who has completed all requirements for the degree of Associate in Arts may be permitted by the Dean of the College, on recommendation by the department, to count not more than 6 units of upper division work taken in the lower division as part of the major, but not as part of the 36 units of upper division work required to be completed in the upper division.

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



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

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

See further, under Study-List Regulations, page 70.

#### ORGANIZED MAJORS AND PROFESSIONAL CURRICULA

To fulfill the major requirement for the A.B. degree, a student may select one of the organized programs listed below. It is possible to prepare other suitable programs. A student may therefore present a plan for a major program to the Executive Committee of the College. If the plan is approved, the committee will designate a member of the faculty to take charge of the student's special major and to approve the upper division study lists and the completion of the major.

The departmental programs designated below are described in detail under Courses of Instruction in the GENERAL CATALOGUE, DAVIS CAMPUS:

American Civilization	German	Physics
Botany	History	Political Science
Chemistry	Mathematics	Pre dental
Economics	Medical Sciences	Premedical Curriculum (see Medical Science)
English	Microbiology	Spanish
French	Physical Science	Zoölogy

#### GROUP MAJORS

##### American Civilization

*Group Major Adviser:* Mr. W. Turrentine Jackson.

*Preparation for the Major.*—Required: Economics 1A-1B, English 1A-1B or Speech 1A-1B, History 4A-4B, Political Science 1 and 2. The student must have maintained an average grade of C or higher and must have obtained the degree of Associate in Arts or upper division standing.

*The Major.*—Twenty-four units, of which 21 units are to be selected by the student with the approval of the committee in such fields as geography, American history, political science, economics, sociology, 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 3 of the 24 units.

##### 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 School of Medicine may reduce by one year the total time for attaining the two degrees, by offering the first year of the School of Medicine curriculum as the senior year in 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 School of Medicine, 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 School of Medicine 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 School of Medicine, and if he is admitted to the School of Medicine may register simultaneously as a senior in the College of Letters and Science. The curriculum of the first year of the School of Medicine 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 School of Medicine is limited. Candidates for admission in the first-year class are accepted primarily on the basis of scholarship, particular emphasis being placed on the required subjects. Two personal interviews are also held. Arrangements for personal interviews are made by the Dean's office after a formal application has been filed and credentials rated. In addition, each applicant must take the Medical College Admission Test.

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

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

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

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

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

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

(b) Ordinarily not more than one applicant will be accepted from outside the continental United States and Hawaii. This applicant must have completed at least one year at the University of California or at an equivalent institution in the United States, one semester of which must have been completed previous to February 15 of the year of admission. It may happen that a student who has completed the premedical curriculum and attained full senior standing in the College of Letters and Science is not admitted to the School of Medicine. 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 School of Medicine. This can be done without in any way interfering with the completion of the premedical requirements.

An applicant for admission to the School of Medicine who in any year is unsuccessful in gaining admission to the School on account of an inferior scholarship record, may, at the proper time, present a second application for admission. His success in being granted 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 School of Medicine 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. If he desires to begin his work in a later year, he is required 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 School of Medicine. 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 School of Medicine, provided he has completed work in the specific subjects required for admission. The minimum requirements in these subjects in terms of courses offered at Berkeley are: English 1A-1B (or Speech 1A-1B); Chemistry 1A-1B, 5, 8; Physics 2A-2B, 3A-3B; Zoölogy 1A-1B, 4, 100; 8 units of a modern foreign language. Psychology 160, 168 and Public Health 160A, 160B are recommended strongly.

The Committee on Admissions to the School of Medicine 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 School of Medicine, see the ANNOUNCEMENT OF THE SCHOOL OF MEDICINE.

#### Premedical Curriculum

*Adviser:* Mr. L. E. Rosenberg.

In order that entrance to the School of Medicine 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 School of Medicine. A suggested program follows:

FIRST YEAR			SECOND YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
*Subject A .....	..	..	Military Science .....	2	2
Military Science .....	2	2	Zoölogy 1A-1B .....	4	4
Chemistry 1A-1B .....	5	5	†Foreign Language .....	4	4
†English 1A-1B or Speech 1A-1B .....	3	3	Year Course (See require- ment (e) for degree of Associate in Arts).....	3	3
‡Foreign Language.....	4	4	Year Course (See require- ment (e) for degree of Associate in Arts).....	3	3
Electives as necessary to make up units.....	..	3	Elective .....	1	..
	—	—		17	16
	14	17			

\* For regulations concerning Subject A, see page 32; American History and Institutions, page 32.

† English: any 3 units in composition plus any 3 units in English literature will satisfy this requirement. Speech 1A or 1B may be offered in place of either course in English. If the student fails to pass the examination in Subject A it will be necessary to postpone English (or Speech) until he has completed the course in Subject A, for which no credit in units is given. The student is advised to substitute in the interim one of the year courses under requirement (e) for the degree of Associate in Arts in place of English (or Speech).

‡ See double dagger (§) footnote on next page.

THIRD YEAR		
Course	Fall Units	Spring Units
Physics 2A-2B .....	3	3
Physics 3A-3B .....	1	1
†Chemistry 5 .....	3	or 3
†Chemistry 8 .....	3	or 3
Zoölogy 100A .....	2	..
Zoölogy 100C .....	2	..
Zoölogy 104 .....	3	..
Elective .....	..	5 or 11
	17	15

#### FIRST YEAR, SCHOOL OF MEDICINE

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

*Adviser:* Mr. L. E. Rosenberg.

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

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

#### Physical Science

*Group Major Advisers:* Mr. Patten, Mr. Reiber.

*Major in Physical Science.*—This major is designed primarily for students who wish to obtain subsequently a general secondary credential with a major in this field. It should be noted that the lower division requirements parallel to a considerable degree those of the major in chemistry or physics. In addition, it is recommended that the teaching minor be in mathematics or biological science.

*Preparation for the Major.*—Required: Chemistry 1A-1B, 5, Physics 4A, 4B, 4C, Mathematics 11A-11B. If the teaching minor is mathematics, courses 3A-3B, 4A-4B should be substituted for 11A-11B.

*The Major.*—Twenty-four units of upper division work in chemistry and physics taken in accordance with a plan approved by the major adviser. These must include Chemistry 8, 9, 109 or their equivalent, and a minimum of 6 upper division units in physics (Physics 129 is not acceptable). The balance of the 24-unit requirement may consist of chemistry and/or physics courses.

All units in chemistry in excess of 13 are counted as upper division units, and if taken in the upper division will count as upper division credit toward the 36-unit requirement of the College of Letters and Science.

#### Letters and Science List of Courses

*Of the 120 units required for the degree of Bachelor of Arts, at least 108 units must be in courses chosen from the Letters and Science List of Courses. Any course not included in this list, but required, or accepted, as part of a major or as a prerequisite to a group major, shall, for any student in that major or group major, but for no others, be treated as if it were in the Letters and Science List of Courses.*

† Foreign language: the School of Medicine requirement is 8 units of credit in a modern foreign language, and the requirement for the degree of Associate in Arts is 16 units in not more than two languages. These may be satisfied partly in high school.

A student who has completed all or part of the language requirement in high school may take Chemistry 5 or Chemistry 8 in the second year.

The following list refers to the courses as given in the departmental offerings for the fall and spring semesters, 1953-1954.

Agricultural Economics 120, 125.	History. All undergraduate courses.
Animal Husbandry 101, 110, 125, 130.	Latin. All undergraduate courses.
Art. All undergraduate courses.	Mathematics. All undergraduate courses.
Bacteriology. All undergraduate courses.	Military Science and Tactics. A total of not more than 8 units of lower division courses.
Botany. All undergraduate courses except 8 and 107.	Music. All undergraduate courses. A total of not more than 8 units from performance courses.
Business Administration 1A, 1B.	Philosophy. All undergraduate courses.
Chemistry. All undergraduate courses.	Physics. All undergraduate courses.
Classics. All undergraduate courses.	Physiology 1, 1L.
Decorative Art. All undergraduate courses.	Plant Pathology 124A, 124B.
Dramatic Art. All undergraduate courses.	Political Science. All undergraduate courses.
Economics. All undergraduate courses.	Psychology. All undergraduate courses.
Education 110.	Sociology. All undergraduate courses.
English. All undergraduate courses.	Soil Science 106, 110.
Entomology 100, 106, 112, 127.	Spanish. All undergraduate courses.
Food Technology 116.	Speech. All undergraduate courses.
French. All undergraduate courses.	Veterinary Science 124, 140, 140L.
Genetics 100, 100C, 103, 106.	Zoölogy. All undergraduate courses.
Geological Sciences. All undergraduate courses.	
German. All undergraduate courses.	
Greek. All undergraduate courses.	

#### HONORS

Honors are granted only with the bachelor's degree; honorable mention is given with the Associate in Arts degree. Honor students in the upper division are as follows:

(a) Any student who has received honorable mention with the degree of Associate in Arts (or with junior standing) and who is in the first semester of the upper division;

(b) Any upper division student who has an average of at least 2 grade points for all units of undergraduate work undertaken at the University of California;

(c) Any upper division student specially approved for listing in honors status by the Committee on Honors of the College, either on recommendation made by departments of instruction, or on some other basis determined by the Committee.

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

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

Departments may offer special honors courses in reading and in research with credit to be determined by the instructors in charge, subject to such general restrictions as may be imposed by the department, the College, or the Committee on Courses of Instruction of the Davis Division, Northern Section of the Academic Senate. Such an honors course may consist of additional work in connection with a regular course of instruction, or may be independent.

Special honors courses may be taken by any student named on the honors list of the College, and by any other student authorized to do so by the Committee on Honors.

Credit in any honors 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. He should complete any reorganization of his program with all possible promptness.

Each semester an honor student may take, subject to the approval of the instructor concerned, one course in which he will be graded only "passed" or "not passed" provided that this course is not required for his major and not related to the field of his major. To take such a course the honor student must present a petition, approved by the instructor, to the Dean of the College before the last date on which courses may be added to the study list. The status of a course on the "passed" "not passed" basis may not be changed after that date. Units thus gained are not counted in the total required for graduation (120 units) for which grade points are recorded.

An honor student in senior standing who has attained at least a B average in the junior year at the University of California has 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 with distinction, and whose general record is satisfactory to the Committee on Honors.

Before Commencement each department and also the major adviser for each group major will determine, by such means as they may deem best (for example, by 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 the department and the Committee on Honors, display marked superiority may be recommended for the special distinction of highest honors.

The Committee on Honors will consider recommendations from the departments and the group major advisers, and will transmit to the Faculty of the College of Letters and Science (Davis) its recommendations concerning the award of Honors and Highest Honors.

The list of students receiving honors or highest honors is published in the annual COMMENCEMENT PROGRAM.



Main entrance of Agricultural Engineering Building

## COLLEGES OF ENGINEERING\*

### Agricultural Engineering

THE COLLEGES OF ENGINEERING, Berkeley and Los Angeles, with the coöperation of the College of Agriculture, offer the curriculum in Agricultural Engineering leading to the degree of Bachelor of Science.

The first two years of this curriculum may be taken at Davis; the third year is given only at Berkeley or Los Angeles; and the summer field course and the senior program at Davis. However, the entire facilities of the Engineering Colleges at Berkeley and Los Angeles are available to train the agricultural engineering student in his first three years in the same manner as other engineering students are trained. The senior courses at Davis are planned to take advantage of the agricultural staff and laboratories, in such fields as soil science, agronomy, and irrigation, and particularly of the staff and facilities of the Department of Agricultural Engineering. The curriculum is designed to prepare the student to apply engineering principles to agricultural practice. The engineering courses given at Davis include the design, selection, operation, and maintenance of farm power and machinery; the design and construction of farm structures; selection of building materials; design of farmstead sanitation, lighting, and water supply; and theory of heat transfer, evaporation, and processing. A course in irrigation covers hydraulic systems, ground-water supplies and plant use of water. Soil profiles, properties, structures, classification, and management are included in a supplementary course in soil science. A special summer practice and travel course is offered which includes a study of engineering problems on typical farms in California; inspection of dairy processing plants, fruit and vegetable packing plants, dehydrators and implement manufacturing plants; and laboratory and field studies of farming equipment.

#### EXAMPLE OF AGRICULTURAL ENGINEERING PROGRAM (College of Engineering)

<i>Freshman Year</i>					
Berkeley or Davis			Los Angeles		
<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Course</i>	<i>Fall Units</i>	<i>Spring Units</i>
†Military Science.....	2	2	†Military Science and Physical Education ...	2	2
Mathematics 3A-3B .....	3	3	Mathematics 5A-5B .....	5	3
Physics 4A .....	4	4	Physics 1A .....	3	3
Chemistry 1A, 8 .....	5	3	Chemistry 1A-1B .....	5	5
Engineering 22, 23 .....	2	2	Engineering 2, 8 .....	3	2
Engineering 1A .....	3	..	Engineering 11A .....	..	2
Elective .....	..	3	Engineering 1FA .....	..	1
	—	—	Engineering 48 .....	1	..
Engineering 48 (recom- mended) .....	15	17		—	—
	1	..		16	18

\* Prospective students should consult the ANNOUNCEMENT OF THE COLLEGES OF ENGINEERING.

† Or Naval Science (3 units per semester—not available at Davis).



## Sophomore Year

Berkeley or Davis			Los Angeles		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
*Military Science	2	2	*Military Science and Physical Education	2	2
Mathematics 4A-4B	3	3	Mathematics 6A-6B	3	3
Physics 4B-4C	4	4	Physics 1D-1C	3	3
†Engineering 40-41	3	4	Engineering 15A-15B	3	3
Engineering 35	..	3	Electives	7	7
Engineering 24	2	..			
†Agricultural Engineering 12	..	2			
Elective	3	..			
	17	18		18	18
Agricultural Engineering 49 (6)—required field course at Davis.			Agricultural Engineering 49 (6)—required field course at Davis.		

## Junior Year

Berkeley			Los Angeles		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Engineering Design 102B	3	..	Engineering 102B	3	..
Mechanical Eng. 103	3	..	Engineering 103A	..	3
Mech. Eng. 105A-105B	3	3	Engineering 105A-105B	3	3
Civil Engineering 108A	3	..	Engineering 108B	2	..
Civil Engineering 108F	1	..	Engineering 108F	..	1
Electrical Eng. 100A-100B	3	3	Engineering 100A-100B	3	3
Electrical Eng. 104A-104B	1	1	Engineering 104A-104B	2	2
Agricultural Economics 140	..	3	Mathematics 110C	3	..
Engineering Design 106 (or Civil Eng. 107A)	..	4	Electives	2	6
Elective	..	3			
	17	17		18	18

## Senior Year

## Davis

Course	Fall Units	Spring Units
Agricultural Engineering 113	..	4
Agricultural Engineering 114	3	..
Agricultural Engineering 115	3	..
Agricultural Engineering 180	..	1
Mechanical Engineering 151 (or Physics 112)	3	..
Mechanical Engineering 152A (or Chemistry 109)	..	3
Irrigation 120	3	..
Soil Science 106	..	4
Agromony 1	3	..
Elective (completing at least 12 units in the humanities)	3	3
	18	15
Recommended technological electives: Agricultural Economics 140, Agricultural Engineering 198 or 199, Agricultural Engineering 106, Animal Husbandry 101, Bacteriology 1, Botany 1, Botany 107, Chemistry 101, Chemistry 109, Dairy Industry 1, Irrigation 125, 130, 160, Soil Science 110, Zoölogy 10	..	2 to 5

\* Or Naval Science (3 units per semester—not available at Davis).

† Agricultural Engineering 12 is recommended but not required of students entering as juniors.

‡ Not offered at Davis.

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

The allocated technical courses have been limited in order to provide opportunity for the student to take cultural courses. For students registered in the College of Engineering at Berkeley, 12 units of free electives are required for graduation, of which 3 units must be selected in English or speech, and a total of 9 units from any two of the remaining groups:

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

Engineering students who are also to be candidates for military commissions may present 6 units of R.O.T.C. upper division work in place of the same number of elective units. The state requirement for 6 units of American history and institutions technically falls in the 9 units of free electives, but it is possible for these subjects to be passed by examination if greater advantage is to be taken of the wide selection of nonengineering courses available at Berkeley and Los Angeles.

Students preparing for careers in teaching, research, or analytical design should intensify their undergraduate work and plan for graduate work. The ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the ANNOUNCEMENT OF THE GRADUATE DIVISION, SOUTHERN SECTION, describe the requirements for advanced degrees. Fellowships or half-time assistantships are available to superior students.



Main entrance to Veterinary Science Building, showing reading room on the left

## SCHOOL OF VETERINARY MEDICINE\*

THE SCHOOL OF VETERINARY MEDICINE offers a two-year curriculum leading to the degree of Bachelor of Science and a two-year graduate curriculum leading to the degree of Doctor of Veterinary Medicine.

### Admission to the School of Veterinary Medicine

Candidates for admission to the School of Veterinary Medicine must complete:

- A. Mathematics, 6 units‡; Subject A; military or naval science; and American History and Institutions, as required.
- B. At least 60 units of credit in one of the colleges of the University of California or in an accredited institution, including the prescribed subjects listed in the following preveterinary curriculum (except that minor shortages may be waived by the Admissions Committee of the School of Veterinary Medicine):

<i>Preveterinary Curriculum</i>	<i>Units</i>
English composition and additional English or speech.....	6
Chemistry (general, inorganic, organic, and analytical).....	16
Zoölogy .....	8
Physics (mechanics, heat, light, electricity).....	6
Restricted electives† .....	12
	48

The preveterinary curriculum offers a well-balanced basic training in natural science and the humanities which will not only prepare the candidate for the courses in the School of Veterinary Medicine, but also to meet the varied problems of his chosen profession.

*Enrollment in the School is limited, with the candidates being selected in major part on the basis of scholarship. The student should, therefore, plan his program in such a way that in the event that he fails to enter the School of Veterinary Medicine, he can complete the requirements for the bachelor's degree in some other curriculum without loss of time.*

Students are admitted to the School of Veterinary Medicine in the fall of each year. The necessary application blanks may be obtained after January 1 from the Registrar, University of California, Davis, and filed with him before April 1. All the requirements need not be completed at that time, but the student must supply a transcript showing work in progress.

*Admission in Advanced Standing.*—An applicant for admission in advanced standing may be accepted under the following conditions:

1. He must furnish evidence that he was eligible for admission to the first semester of the School of Veterinary Medicine.
2. He must show that he has satisfactorily completed courses equivalent in kind and amount to those given in the School of Veterinary Medicine in the semester or semesters preceding that in which admission is desired.
3. He may be required to pass examinations in any or all subjects for which credit is asked.

\* Prospective students should consult the ANNOUNCEMENT OF THE SCHOOL OF VETERINARY MEDICINE, obtainable without charge from the Registrar, University of California, Davis.

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

‡ May be completed in high school.

### **Selection of Applicants**

Enrollment in the School of Veterinary Medicine is limited for reasons explained below. Candidates for admission are selected primarily on scholarship with particular emphasis being placed on the preveterinary requirements. A personal interview may be required; if so, the Chairman of the Committee on Admissions will notify those concerned. Eligible applicants will not be considered until after the last date for filing applications.

For the information of those applicants who may be concerned with residence requirements, the following statements relative to residency are offered:

1. Not more than five applicants in each class whose legal residence is other than that of California will be accepted. The Committee on Admissions, however, is not obligated to select any out-of-state applicants.
  - a. These five out-of-state applicants will ordinarily be selected from the bordering western states of Arizona, Nevada, and Oregon, and from the Territory of Hawaii. To be considered an applicant from one of these places mentioned, the student must be a legal resident of that state or territory.
  - b. An exceptional candidate from anywhere in the world will be considered.
2. To be considered a California applicant, a student must have completed his preveterinary work in a college or university of this State and must be a legal resident of the State of California, who lived in the State prior to the beginning of his preveterinary work. An exception will be made for a legal resident of California who left the State temporarily for the completion of all or part of his preveterinary work.
3. Applicants entering the State of California to complete the preveterinary curriculum will not be considered among the applicants of the State of California.

It is necessary to limit enrollment in the School. The basic reason is the supply of clinical material. Registration of students in excess of material and facilities available has been tried at other veterinary schools. It resulted in so many students necessarily being assigned to limited numbers of cases that accreditation of the schools attempting it became jeopardized.

Minimum requirements for accreditation are outlined by the American Veterinary Medical Association and the Bureau of Animal Industry, United States Department of Agriculture, the largest employer of veterinarians in this country.

The two final years of the curriculum in Veterinary Medicine are administered by the Graduate Division, Northern Section. Upon completion of the requirements for the degree of Bachelor of Science, application must be filed for admission to the Graduate Division through the Dean of the School of Veterinary Medicine. Further information is given in the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, which may be obtained from the Assistant Dean of the Graduate Division, Room 201, Library-Administration Building.

### **Requirements for the Degree of Bachelor of Science**

The degree of Bachelor of Science with a major in Veterinary Science is granted, upon the recommendation of the Faculty of the School of Veterinary Medicine, to students who:

1. Satisfy the general University requirements\* including:
  - (a) Subject A.
  - (b) Military or Naval Science.
  - (c) American History and Institutions.
  - (d) Residence at Davis during the final undergraduate year in the School of Veterinary Medicine.
  - (e) Attainment of at least as many grade points as units of credit in courses undertaken at this University.
2. Complete, in the School of Veterinary Medicine, the following 73 units of prescribed courses. This total may be reduced in the case of students with advanced standing.

	<i>Units</i>
(a) Biochemistry .....	5
(b) Physiology .....	9
(c) Genetics .....	3
(d) Botany .....	2
(e) Nutrition .....	3
(f) Veterinary Science .....	45
(g) Zoölogy .....	6
	73

### **Requirements for the Degree of Doctor of Veterinary Medicine**

A. The candidate for the degree of Doctor of Veterinary Medicine must have completed the requirements for the bachelor's degree in one of the colleges or schools of the University of California or at another college or university of approved standing.

B. He must give satisfactory evidence of possessing a good moral character.

C. He must have studied veterinary medicine for the equivalent of eight semesters of sixteen weeks each. The last two years must have been spent in the University of California School of Veterinary Medicine. He must have completed the required work, have fulfilled satisfactorily all special requirements, and have received throughout the entire veterinary course a satisfactory grade as determined by the Faculty of the School and by the Graduate Council of the Northern Section.

### **Graduate Study**

For information on work leading to higher degrees other than the D.V.M., see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, which may be obtained from the Assistant Dean of the Graduate Division, Room 201, Library-Administration Building.

### **PLAN OF STUDY**

#### **Preveterinary Curriculum**

The following schedule of study need not be rigidly adhered to but it satisfies the requirements without conflicts. This schedule also satisfies the general requirements of the Animal Science Curriculum if Botany 1, Geology or Soils, Bacteriology 1, and Economics 1A-1B are taken as electives.

\* See page 48 for the College of Agriculture degree requirements. Note that 124 units altogether are required for the B.S. degree.

FRESHMAN YEAR			SOPHOMORE YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Military Science .....	2	2	Military Science .....	2	2
English 1A .....	3	..	Chemistry 5, 8 .....	3	3
English 1B or Speech 1A. . .	..	3	Physics 2A, 2B .....	3	3
Chemistry 1A, 1B.....	5	5	Electives .....	6	9
Zoölogy 1A, 1B.....	4	4			
Elective .....	3	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	17	17		14	17

### Veterinary Curriculum

The completion of the first two years of the curriculum of the School of Veterinary Medicine satisfies the requirements for the degree of Bachelor of Science. The courses are primarily preclinical sciences but are closely correlated with and are basic to the work in the clinical sciences of the last two years.

The following are the schedules for the first two years of the School of Veterinary Medicine, corresponding to the junior and senior years of undergraduate study. The graduate curriculum in the School of Veterinary Medicine is given under the third and fourth years.

FIRST YEAR			SECOND YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Veterinary Science 120, 140	10	6	Veterinary Science 121, 124	10	5
Veterinary Science 140L .. .	..	3	Veterinary Science 122A,		
Zoölogy 107 .....	4	..	122B .....	5	5
Animal Husbandry 101 .. .	..	3	Veterinary Science 123A,		
Zoölogy 100A .....	2	..	123B .....	4	4
Veterinary Science 102 .. .	..	2	Botany 8 .....	..	2
Nutrition .....	3	..	Veterinary Science 125 .. .	..	2
Genetics 100 .....	..	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	19	17		19	18

THIRD YEAR			FOURTH YEAR		
Course	Fall Units	Spring Units	Course	Fall Units	Spring Units
Veterinary Medicine 201, 202.	4	4	Veterinary Medicine 206, 207.	4	4
Veterinary Medicine 203, 204.	4	5	Veterinary Medicine 208.....	3	..
Veterinary Medicine 230, 205.	4	3	Veterinary Medicine 223, 240.	5	5
Veterinary Medicine 220, 221.	3	4	Veterinary Medicine 251A, 251B	5	5
Veterinary Medicine 235, 222.	3	2	Veterinary Medicine 252A, 252B	1	1
Veterinary Medicine 254A, 254B	0	0	Veterinary Medicine 256A, 256B	1	1
Veterinary Medicine 260.....	1	..	Veterinary Medicine 270A, 270B	0	0
	<hr/>	<hr/>		<hr/>	<hr/>
	19	18		19	16

\* At Berkeley and Los Angeles, Zoölogy 1A may be taken, by special arrangement, in the freshman year, provided Chemistry 1A is taken concurrently.

## GRADUATE DIVISION, NORTHERN SECTION\*

The University of California offers opportunities for graduate study in academic and professional fields on its campuses at Davis, Berkeley, San Francisco, Mount Hamilton, Los Angeles, and Riverside, and at the Scripps Institution of Oceanography at La Jolla. Graduate study and research in the University's centers of instruction at Berkeley, Davis, Mount Hamilton, and San Francisco is administered by the Council of the Graduate Division, Northern Section, which maintains offices on the Berkeley campus under the Dean of the Graduate Division. The work offered on the campuses at Los Angeles, Riverside, and La Jolla is administered by the Graduate Division, Southern Section, with offices at Los Angeles.

The University endeavors to publish full information for the guidance of graduate students. Failure of students to acquaint themselves fully with the organization and regulations of the University may cause complications for which the student is expected to assume the responsibility. For all information affecting the status of graduate students not contained in the official University bulletins, application should be made at the Office of the Graduate Division, 201 Library-Administration Building. Special announcements for the information and guidance of graduate students are published from time to time in the *University Calendar* and on the bulletin boards. Students should consult the bulletin boards regularly.

### Organization of Graduate Study and Research

Graduate study and research is offered at Davis in:

Agricultural Chemistry	Horticulture
Agricultural Engineering	Irrigation
Agronomy	Mathematics
Animal Husbandry	Microbiology
Botany	Nutrition
Chemistry	Plant Pathology
Comparative Biochemistry	Plant Physiology
Comparative Pathology	Poultry Science
Comparative Pharmacology and Toxicology	Preveterinary Medicine
Comparative Physiology	Soil Science
Education	Vegetable Crops
Entomology	Veterinary Medicine
Food Science	Veterinary Science
Genetics	Zoology

The School of Veterinary Medicine offers a curriculum leading to the degree of Doctor of Veterinary Medicine (see page 89).

Graduate study and research is offered in certain subjects represented in the existing departments of the College of Letters and Science.

For complete information concerning opportunities for graduate study and research, students should confer with the department concerned. An Assistant Dean of the Graduate Division, Northern Section, is resident on the Davis campus in Room 201 Library-Administration Building.

### 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 agricul-

\* For specific requirements for admission to candidacy for degrees in the Graduate Division, see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.



ture or homemaking, or the general secondary teaching credential, or both. At least one year of graduate work is required to fulfill the requirements.

The special credential permits the holder to teach vocational agriculture under the Smith-Hughes Act or family life education under the Federal and State Vocational Education Acts, but without a general secondary credential the future teacher will be severely handicapped.

*\*The Special Secondary Credential in Vocational Agriculture.*—The University of California coöperates with the Bureau of Agricultural Education of the State Department of Education in offering the graduate training required for the special vocational agriculture credential. The upper division and professional courses in education required for this credential are available on the Davis campus. Students desiring admission to the graduate training for the special credential must apply for and receive "cadet" appointments from the Chief of the Bureau of Agricultural Education. Appointments are made only after personal interviews. Application must also be made for admission to the Graduate Division of the University. Since supervised teaching comprises a major part of this training, students spend one semester of this fifth year in directed teaching centers. (See "Incidental Fee," page 41.)

*The Special Secondary Limited Credential in Agriculture.*—This credential authorizes the holder to teach the agricultural subjects named in the credential in secondary schools and requires 8 semester units of work in each of the subjects named. It does not authorize the holder to teach vocational agriculture in departments organized under the Federal and State Vocational Acts. Fifteen semester hours of professional work in education, including 4 semester units of directed teaching in agriculture, are required.

*The Special Secondary Credential in Homemaking.*—The University of California coöperates with the Bureau of Homemaking Education of the State Department of Education in offering the training required for this credential. The required upper division and professional courses in education are available on the Davis and Berkeley campuses, and the undergraduate courses comprising the general major in home economics satisfy the subject-matter requirements for this credential.

Normally one semester of graduate work devoted primarily to supervised teaching and instruction in professional methods is required to complete credential requirements.

*The General Secondary Credential.*—The holder of the general credential with a major in agriculture or homemaking 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, George-Deen, etc.).

The candidate for the recommendation for the general credential must satisfy the following specific requirements of the State Department of Education:

1. A four-year college course with an acceptable bachelor's degree.
2. One year of thirty semester hours of postgraduate work of upper division or graduate level or a year of postgraduate preparation which an accredited institution certifies as fulfilling institutional requirements for a postgraduate year of work. This work shall include:
  - (a) Six semester hours in professional education courses.

\* A special summer session for high school teachers of vocational agriculture will be offered on the Davis campus beginning July 13, 1953, and ending August 21, 1953. This session will offer courses in education and agriculture for students who are candidates for teaching credentials and for teachers of agriculture and farm advisors who desire graduate training. Courses will also be offered for teachers who desire to complete requirements for administrative and supervisory credentials.

(b) Six semester hours in subject fields commonly taught in junior and senior high schools.

This postgraduate work shall be completed following admission to graduate standing.

3. Forty semester hours of general education with a minimum of six semester hours in each of the following four areas:

- (a) Science and mathematics.
- (b) The practical arts and the fine arts, such as art, music, homemaking, health education, physical education, industrial arts, and similar fields.
- (c) Social studies.
- (d) The communicative arts, such as languages, literature, speech arts, and similar fields.

Courses offered in fulfillment of the general education requirement may also be applied toward the fulfillment of major and minor requirements, provided the courses are within the same subject as the major and minor.

4. Twenty-two semester hours of professional work in education including the following areas:

- (a) The scope and function of the secondary school.
- (b) Growth and development; learning process; mental hygiene or personal development.
- (c) Counseling and guidance.
- (d) Curriculum; methods; evaluation of instruction at the secondary level.
- (e) Six semester hours of directed teaching. At least one-half of this requirement shall be completed by teaching any grade from seven through twelve. Successful teaching experience in public schools or in private schools of equivalent status may be substituted for directed teaching at the rate of one year of full-time teaching for one-half the requirement.

5. One major and one minor in teaching fields commonly taught in California senior or four-year high schools, or a major\* in a field not commonly taught and two minors\* in acceptable teaching fields. The minimum requirement for a major shall be thirty-six semester hours except for special fields. Twelve semester hours of the work for the major\* shall be upper division or graduate work. The minimum requirement for a minor shall be twenty semester hours.

6. The completion of a two-semester hour course or the passing of an examination on the provisions and principles of the Constitution of the United States.

7. A scholarship record of C or better is required in the teaching major, the teaching minor, the courses in Education including supervised teaching, and in the total college program both graduate and undergraduate.

\* For University of California recommendation a teaching major and a teaching minor in subjects taught in high schools must be presented. The teaching major is defined as 36 units, including 24 units of upper division or graduate work. The teaching minor is defined as 20 units including ordinarily 9 units of upper division or graduate work. The student must maintain the following scholarship ratings in the various classifications of this work:

Upper division work .....	A grade-point average of at least 1.5
Postgraduate work .....	A grade-point average of at least 1.75
Education courses .....	A grade-point average of at least 1.0
Work for the major .....	A grade-point average of at least 1.75
Work for the minor .....	A grade-point average of at least 1.0

# THE TWO-YEAR CURRICULA IN AGRICULTURE COLLEGE OF AGRICULTURE

## GENERAL INFORMATION

THE UNIVERSITY OF CALIFORNIA, in its Two-Year Curricula in Agriculture, offers prospective farmers, persons preparing for related vocations, and all others interested in California agriculture a systematic training on a college level in a university atmosphere and a rural environment. Formal scholastic qualifications are not required. This opportunity is intended for both men and women. It is open not only to high school graduates, but to other qualified persons at least eighteen years of age who wish to study agriculture without undertaking a four-year curriculum leading to an academic degree.

The nature of the subject matter covered and of the instructional methods employed is such, however, that only those persons having adequate preliminary practical farm experience, or those otherwise genuinely motivated, can hope to realize the fullest possibilities of the training facilities available. Efficient agricultural production or effective performance in a related technical or semi-professional field is assumed to be the educational objective of every student.

A Certificate of Graduation is awarded those students who meet the requirements set forth in this bulletin. Although some courses are required of all candidates for graduation, the studies have been grouped into major-subject programs. This grouping facilitates scheduling (and it also permits students to pursue definite vocational objectives. However, with the approval of the Supervisor of Two-Year Instruction, students may satisfy the requirements for graduation by the completion of a more generalized program of studies. Certain prerequisite courses must be taken in the sequence specified in each major-subject program.

Besides the four-year degree curricula and the regular two-year curricula in agriculture offered at Davis, special one- and two-semester programs in applied agriculture are offered for adult students. These special programs have no admission requirements, and the usual prerequisite courses may be waived. All special programs, however, must be approved by the Supervisor of the Two-Year Curricula and by the instructors concerned.

## POSITIONS OPEN TO GRADUATES

Most of the graduates and former students in the University Farm School and the later Nondegree and Two-Year Curricula are either managing their own farms or are employed as farm managers and foremen; this situation will probably continue. Many of the older alumni, however, are now engaged in related agricultural vocations.

Close contact with the agricultural industry of the State enables members of the teaching and research staff to anticipate the demands for trained men in the various fields, to meet the changing needs of the industry, and to recommend graduates for employment. Positions of responsibility usually require, besides the regular college courses, one or more seasons of practical training under commercial conditions. Such experience, which often results in business connections leading to permanent employment, may be obtained during summer vacations or through apprenticeship after graduation. Much depends upon the candidate's inherent ability.

Many different vocations have been open to graduates of the Two-Year Curricula in the past, and the demand for trained personnel still continues. Positions that pay adequate wages and permit advancement are often available for assistant buttermakers, cheesemakers, ice-cream makers, milk testers, and assistant technicians in commercial dairy-manufacturing and distribution plants; herdsmen; advanced registry testers; skilled poultry and apiary workers; horticultural and dairy inspectors; field agents in the fruit-and-vegetable standardization and shipping-point inspection services; county agricultural inspectors; caretakers of private estates; foremen of public parks, landscape contractors, nurserymen, and florists; field men, salesmen, and skilled workers for seedmen; weed- and rodent-control specialists; workers skilled in controlling insect and other household and farmstead pests; plant- and disease-control specialists and contractors; and foremen of water delivery for irrigation districts and large farm enterprises. The rapidly expanding field of food preservation (canning, dehydration, and freezing storage) offers new opportunities to graduates in truck crops and horticulture.

### **TRAINING IN AGRICULTURAL SKILLS**

Supported by a generous gift to the University by the late Mr. Fred H. Bixby, a program has been developed to offer training without credit in various agricultural skills.

The Division of Farm Practice provides opportunities to obtain practical agricultural experience by working on selected farms and in agricultural industries over the State. On-campus training in skills has been organized to supplement classroom instruction.

Students who have had limited practical farm experience are encouraged to discuss this problem with their faculty advisers and to contact the Farm Practice Office soon after registration to insure sufficient time for the development of a job opportunity that best meets their requirements for practical training in farming and to avail themselves of the noncredit skills training program that is in operation on the campus.

### **ADMISSION AND REGISTRATION**

*Requirements for Admission.*—Admission to the Two-Year Curricula is granted any qualified person who has a high school diploma or who, if not a high school graduate, is at least 18 years of age. Application blanks may be obtained from the Registrar. 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. Credentials from schools beyond the eighth grade (including those from any foreign schools attended) should be submitted at the time of application.

Prospective students who are not graduates of a high school, whose high school academic record is less than average, or who have little or no practical farm or related vocational experience, should make application *in person* and be interviewed by the Supervisor of the Two-Year Curricula, or his representative. Such personal application should be made at least 30 days prior to the opening of any regular semester.

### **ADVANCED STANDING**

Candidates for graduation from the Two-Year Curricula will receive credit for equivalent courses completed with a grade of C or higher in junior colleges or other institutions of collegiate rank. In every instance, however, the

final year of residence and the completion of a major-subject curriculum, or its equivalent as determined by the major-subject adviser, is required for the Certificate of Graduation.

#### **EXTRA-SESSION WORK**

Two-Year students who have completed at least one semester in residence may, with the approval of the instructor, the head of the subject-matter department, and the Supervisor of the Two-Year Curricula, undertake extra-session work. Under this plan, credit toward the Certificate of Graduation is given for a special problem, dealing with the laboratory or field phases of a subject and pursued during the Christmas recess or the summer vacation period, provided the four following regulations are complied with:

- (1) The problem shall require 1 to 8 weeks' effort of 8 hours a day, 5 days a week.
- (2) The student receives no remuneration for his work, other than board and room.
- (3) The credit granted shall not exceed 1 unit for each week of study.
- (4) The student enrolls with the Registrar before beginning the work.

# THE TWO-YEAR CURRICULA AND MAJOR-SUBJECT PROGRAMS

## GRADUATION

*Requirements for the Certificate of Graduation.*—Students completing the following requirements in the Two-Year Curricula in Agriculture will be awarded the Certificate of Completion by the University of California:

1. A minimum of 64 units of credit (of which at least 32 units and the last semester must be completed in residence on the Davis campus), and at least as many grade points as credit units in all courses undertaken in the Two-Year Curricula.

2. The specified courses in American History and Institutions (History 57A or 57B), English (English 50), and Mathematics (Mathematics 50), or their equivalents, and in military science and tactics.

3. A major-subject curricula, or the equivalent as determined by the major-subject adviser concerned.

*Graduation with Honors.*—Students who complete at least two semesters in the Two-Year Curricula with a minimum of 32 semester units and a grade-point average of 2.5 or better are awarded a special Honor Certificate at the time of graduation.

## ANIMAL-PRODUCTION CURRICULA

### ANIMAL HUSBANDRY

The two-year program in animal husbandry is for students primarily interested in horses, dairy cattle, beef cattle, hogs, sheep, or other domestic animals.

The courses listed below, with the exception of those with an asterisk (\*), which are electives from which the student must select 4 units, are required of all students whose major is animal husbandry.

### First Year

FALL SEMESTER	Units	SPRING SEMESTER	Units
Course		Course	
An. Husb. 51. Principles of Animal Husbandry .....	4	Agron. 54. Forage Crops .....	3
Math. 50. Elementary Mathematics .....	3	An. Husb. 52. Feeds and Feeding .....	3
Mil. Sci. 51A. Basic (First Year) ..	2	An. Husb. 54. Animal Breeding .....	3
Zoöl. 51. Biology of Domestic Animals .....	3	Engl. 50. Business Writing .....	2
Elective .....	3	Mil. Sci. 51B. Basic (First Year) ..	3
	15	Elective .....	3
			17

### Second Year

FALL SEMESTER	Units	SPRING SEMESTER	Units
Course		Course	
*An. Husb. 61. Swine Production ..	2	*An. Husb. 56. Horse Production ..	2
*An. Husb. 63. Beef Cattle Production .....	2	*An. Husb. 58. Milk Production ..	2
*An. Husb. 65. Sheep Production ..	2	Mil. Sci. 52B. Basic (Second Year)	2
Hist. 57A. History and Institutions of the United States .....	3	Soil Sci. 52. Soils .....	3
Mil. Sci. 52A. Basic (Second Year)	2	‡Elective .....	7
‡Elective .....	5		
	16		16

\* Choice of production courses depends upon student's interests.

‡ Five units of agricultural engineering are required.

## Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 55. Farm Bookkeeping..	3	Agr. Econ. 54. Farm Management..	3
Bot. 51. Weed Control .....	3	Agr. Engin. 52. Farm Structures...	3
Irrig. 53. Irrigation Practice.....	3	Agr. Engin. 54. Farm Machinery...	3
Poult. Husb. 51. Introduction to Poultry Husbandry .....	4		
Vet. Sci. 51. Animal Hygiene.....	2		

## DAIRY HUSBANDRY

The two-year program in dairy husbandry is designed for students primarily interested in dairy farming.

The courses listed below are required of all students whose major is dairy husbandry.

## First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Chem. 51. Elementary Chemistry...	3	An. Husb. 52. Feeds and Feeding...	3
Dairy Ind. 50. Elements of Dairying	3	An. Husb. 54. Animal Breeding....	3
Math. 50. Elementary Mathematics.	3	Dairy Ind. 54. Market Milk.....	3
Mil. Sci. 51A. Basic (First Year)..	2	Engl. 50. Business Writing.....	3
Zoöl. 51. Biology of Domestic Animals .....	3	Mil. Sci. 51B. Basic (First Year)..	2
Elective .....	3	Elective .....	3
	17		17

## Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 57. Dairy Equipment..	3	Agr. Engin. 52. Farm Structures...	3
Bact. 61. Elementary Bacteriology..	2	Agron. 54. Forage Crops.....	3
Hist. 57A. History and Institutions of the United States.....	3	An. Husb. 58. Milk Production....	2
Mil. Sci. 52A. Basic (Second Year)	2	Mil. Sci. 52B. Basic (Second Year)	2
Elective .....	5	Soil Sci. 52. Soils.....	3
	15	Elective .....	3
			16

## Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 55. Farm Bookkeeping..	3	Agr. Econ. 54. Farm Management..	3
Agr. Engin. 50. Farm Mechanics...	3	Agr. Engin. 50. Farm Mechanics...	3
Agr. Engin. 55. Farm Power.....	3	Agr. Engin. 54. Farm Machinery...	3
An. Husb. 51. Principles of Animal Husbandry .....	4		
An. Husb. 61. Swine Production...	2		
Irrig. 51. Plane Surveying.....	3		
Irrig. 53. Irrigation Practice.....	3		
Poult. Husb. 51. Introduction to Poultry Husbandry .....	4		
Vet. Sci. 51. Animal Hygiene.....	2		

## POULTRY HUSBANDRY

The two-year program in poultry husbandry is designed to give a general working knowledge of poultry production. The more specialized courses, together with special problems (Poultry Husbandry 90), provide the additional instruction needed by those who expect to engage in some phase of the industry. The phases of the poultry industry for which the student may prepare are commercial egg production, poultry breeding, hatchery operation, feed sales and service work, turkey production, or game-bird propagation.

## First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Chem. 51. Elementary Chemistry . . .	3	Agr. Engin. 50. Farm Mechanics . . .	3
Math. 50. Elementary Mathematics. 3		Engl. 50. Business Writing . . . . .	3
Mil. Sci. 51A. Basic (First Year) . .	2	Mil. Sci. 51B. Basic (First Year) . .	2
Poult. Husb. 51. Introduction to Poultry Husbandry . . . . .	4	Poult. Husb. 59. Market Eggs and Poultry . . . . .	2
Zoöl. 51. Biology of Domestic Animals . . . . .	3	Elective . . . . .	5
Elective . . . . .	2		
	17		15

## Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bact. 61. Elementary Bacteriology . .	2	*Agr. Econ. 54. Farm Management . .	3
Mil. Sci. 52A. Basic (Second Year) 2		Agr. Engin. 52. Farm Structures . . .	3
Poult. Husb. 55. Utility Poultry Breeding . . . . .	2	Agron. 52. Cereals . . . . .	3
Poult. Husb. 57. Poultry Nutrition. 2		Hist. 57B. History and Institutions of the United States . . . . .	3
Vet. Sci. 51. Animal Hygiene. . . . .	2	Mil. Sci. 52B. Basic (Second Year) 2	
†Elective . . . . .	5	Poult. Husb. 56. Turkey Production 2	
	15	Elective . . . . .	2
			18

## DAIRY-INDUSTRY CURRICULUM

The two-year program in dairy industry is primarily concerned with the handling of milk and the manufacture of dairy products. The courses are designed for persons who wish to qualify as buttermakers, cheesemakers, ice-cream makers, milk-plant workers, laboratory workers, and dairy inspectors.

## First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 50. Farm Mechanics . . .	3	*An. Husb. 52. Feeds and Feeding . . .	3
*Chem. 51. Elementary Chemistry . .	3	Dairy Ind. 54. Market Milk . . . . .	3
Dairy Ind. 50. Elements of Dairying 3		Dairy Ind. 60. Creamery Practice . .	3
Math. 50. Elementary Mathematics. 3		Engl. 50. Business Writing . . . . .	3
Mil. Sci. 51A. Basic (First Year) . .	2	Mil. Sci. 51B. Basic (First Year) . .	2
*Zoöl. 51. Biology of Domestic Animals . . . . .	3	Elective . . . . .	3
	17		17

\* Recommended elective.

† Poultry Husbandry 53, Incubation and Brooding Practice (3 units), may be elected with the consent of the instructor.



## Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 57. Dairy Equipment..	3	*Agr. Engin. 52. Farm Structures..	3
Bact. 61. Elementary Bacteriology..	2	*An. Husb. 58. Milk Production....	2
Dairy Ind. 51. Cheesemaking.....	3	Dairy Ind. 52. Buttermaking.....	3
Dairy Ind. 53. Ice-Cream Making..	3	Dairy Ind. 62. Dairy Plant Manage- ment .....	3
Hist. 57A. History and Institutions of the United States.....	3	Mil. Sci. 52B. Basic (Second Year)	2
Mil. Sci. 52A. Basic (Second Year)	2	Elective .....	3
	<u>16</u>		<u>16</u>

## PLANT-PRODUCTION CURRICULA

## AGRONOMY

The two-year program in agronomy, as outlined below, has been formulated primarily for students planning to engage in farming. Opportunities are available in special work that involves grading, standardization, and inspection in the control of 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 vegetable crops.

## First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agron. 51. Introduction to Agronomy	3	Agr. Engin. 54. Farm Machinery... 3	3
Bot. 50. Elementary Botany.....	3	Agron. 52. Cereals.....	3
Irrig. 58. Irrigation Practice.....	3	Engl. 50. Business Writing.....	3
Math. 50. Elementary Mathematics.	3	Mil. Sci. 51B. Basic (First Year)...	2
Mil. Sci. 51A. Basic (First Year)..	2	Soil Sci. 52. Soils.....	3
Elective .....	3	Elective .....	3
	<u>17</u>		<u>17</u>

## Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 55. Farm Power.....	3	Agr. Econ. 54. Farm Management..	3
Agron. 53. Cotton, Sugar Beets, Beans, and Miscellaneous Crops.	3	Agron. 54. Forage Crops .....	3
Bot. 51. Weed Control .....	3	Hist. 57A. History and Institutions of the United States .....	3
Entom. 51. Agricultural Entomology	3	Mil. Sci. 52B. Basic (Second Year)	2
Mil. Sci. 52A. Basic (Second Year)	2	Pl. Path. 52. Plant Diseases.....	3
Elective .....	3	Elective .....	3
	<u>17</u>		<u>17</u>

## Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 55. Farm Bookkeeping..	3	Agr. Engin. 50. Farm Mechanics... 3	3
Agr. Engin. 50. Farm Mechanics... 3	3	An. Husb. 52. Feeds and Feeding... 3	3
Pomol. 51. Fruit Growing.....	3	Vegetable Crops 52. Vegetable Crops	3
Introduction to Poultry Husbandry.	4		
Poult. Husb. 51. Introduction to Poultry Husbandry .....	4		

\* Recommended elective.

**LANDSCAPE MANAGEMENT**

The two-year program in landscape management is designed to prepare men and women for the practical business of landscape management 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 sufficient to make up a special one-year program.

**First Year**

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Engin. 51. Drawing.....	2	Engl. 50. Business Writing.....	3
Bot. 50. Elementary Botany.....	3	Lands. Man. 52. Plant Materials... 2	
Lands. Man. 51. General Landscape Management.....	4	Mil. Sci. 51B. Basic (First Year)... 2	
Math. 50. Elementary Mathematics.	3	Pomol. 52. Plant Propagation.....	2
Mil. Sci. 51A. Basic (First Year)..	2	Soil Sci. 52. Soils.....	3
Elective.....	3	Elective.....	3
	17		15

**Second Year**

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 55. Farm Bookkeeping..	3	Hist. 57B. History and Institutions of the United States.....	3
Bot. 51. Weed Control.....	3	Mil. Sci. 52B. Basic (Second Year) 2	
Entom. 51. Agricultural Entomology	3	Pl. Path. 52. Plant Diseases.....	3
Lands. Man. 53. Nursery Practice.	3	Elective.....	6
Mil. Sci. 52A. Basic (Second Year)	2		
Elective.....	3		
	17		14

**Recommended Electives**

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 51. Marketing Agricultural Products.....	3	Agr. Econ. 54. Farm Management..	3
Agr. Engin. 50. Farm Mechanics... 3		Agr. Engin. 50. Farm Mechanics... 3	
Agron. 51. Introduction to Agronomy.....	3	Agr. Engin. 52. Farm Structures... 3	
Chem. 51. Elementary Chemistry... 3		Agr. Engin. 54. Farm Machinery... 3	
Pomol. 51. Fruit Growing.....	3		

**POMOLOGY**

The two-year program in pomology deals with the production of temperate zone tree fruits and berries under California conditions, and with certain phases of their utilization. Field and laboratory facilities and classroom instruction are provided to give opportunity for study of the establishment of orchards; pruning and training of trees; cultivation, irrigation, and fertilization of orchards; varieties; harvesting and packing of fruit for fresh shipment; inspection and marketing of fruits; and drying of prunes, peaches, apricots, and pears. The program is designed as basic training for students who plan to operate and manage their own orchards; to be orchard foremen, managers, or superintendents; or to work in the inspection and standardization of fruits.

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 courses are taken in the sequence suggested below. Those entering in the spring semester may arrange a similar sequence of courses with the aid of their advisers. Spring entrants may, however, experience difficulty in completing the work in four semesters.

### First Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Bot. 50. Elementary Botany.....	3	Engl. 50. Business Writing.....	3
Math. 50. Elementary Mathematics.	3	Hist. 57B. History and Institutions of the United States.....	3
Mil. Sci. 51A. Basic (First Year)..	2	Mil. Sci. 51B. Basic (First Year)..	2
Pomol. 51. Fruit Growing.....	3	Pomol. 54. Orchard Operations....	2
Pomol. 53. Orchard Operations....	2	Soil Sci. 52. Soils.....	3
Elective.....	3	Elective.....	3
	<hr/> 16		<hr/> 16

### Second Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Entom. 51. Agricultural Entomology	3	Mil. Sci. 52B. Basic (Second Year)	2
Irrig. 53. Irrigation Practice.....	3	Pl. Path. 52. Plant Diseases.....	3
Mil. Sci. 52A. Basic (Second Year)	2	Pomol. 52. Plant Propagation....	2
Elective.....	8	Elective.....	9
	<hr/> 16		<hr/> 16

At least 12 units of pomology and 6 units of agricultural engineering must be included. Three of the 12 units of pomology that are required for this major may be satisfied by completing either Viticulture 61 or 62.

### Recommended Electives

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 51. Marketing Agricultural Products.....	3	Agr. Econ. 54. Farm Management..	3
Agr. Econ. 55. Farm Bookkeeping.	3	Agr. Engin. 50. Farm Mechanics...	3
Agr. Engin. 50. Farm Mechanics...	3	Agr. Engin. 52. Farm Structures...	3
Agr. Engin. 55. Farm Power.....	3	Agr. Engin. 54. Farm Machinery...	3
Agron. 51. Introduction to Agronomy	3	Agron. 52. Cereals.....	3
Bot. 51. Weed Control.....	3	Agron. 54. Forage Crops.....	3
Lands. Man. 51. General Landscape Management.....	4	Entom. 52. Beekeeping.....	3
Pomol. 59. Citrus and Other Sub-tropical Fruits.....	3	Vegetable Crops 52. Vegetable Crops	3
Vit. 61. Viticulture.....	3	Vit. 62. Vineyard Operations.....	3

### VEGETABLE CROPS

The two-year program in vegetable 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. Vegetable-crops majors may undertake a special program in vegetable production. The department is well equipped with land and with packing-shed, greenhouses, and coldframe facilities, as well as a large field laboratory.

**First Year**

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agron. 53. Miscellaneous Field Crops	3	Agr. Enjin. 54. Farm Machinery	3
Entom. 51. Agricultural Entomology	3	Bot. 50. Elementary Botany	3
Irrig. 53. Irrigation Practice	3	Engl. 50. Business Writing	3
Math. 50. Elementary Mathematics	3	Mil. Sci. 51B. Basic (First Year)	2
Mil. Sci. 51A. Basic (First Year)	2	Vegetable Crops 52. Vegetable Crops	3
Elective	3	Elective	3
	<hr/> 17		<hr/> 17

**Second Year**

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Enjin. 55. Farm Power	3	Hist. 57A. History and Institutions of the United States	3
Bot. 51. Weed Control	3	Mil. Sci. 52B. Basic (Second Year)	2
Mil. Sci. 52A. Basic (Second Year)	2	Pl. Path. 52. Plant Diseases	3
Vegetable Crops 53. Vegetable Varieties	3	Soil Sci. 52. Soils	3
Elective	6	Vegetable Crops 54. Vegetable Improvement	3
	<hr/> 17	Elective	3
			<hr/> 17

**Recommended Electives**

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Agr. Econ. 51. Marketing Agricultural Products	3	Agr. Econ. 54. Farm Management	3
Agr. Econ. 55. Farm Bookkeeping	3	Agr. Enjin. 50. Farm Mechanics	3
Agr. Enjin. 50. Farm Mechanics	3	Agr. Enjin. 52. Farm Structures	3
Agron. 51. Introduction to Agronomy	3	Agron. 52. Cereals	3
Pomol. 51. Fruit Growing	3	Entom. 52. Beekeeping	3

**VITICULTURE**

The two-year program in viticulture deals with the production of grapes under California conditions and with certain phases of their utilization. Vineyard and laboratory facilities and classroom instruction are provided to give opportunity for study of the establishment of vineyards; pruning and training of vines; cultivation, irrigation, and fertilization of vineyards; varieties; harvesting and packing of grapes; grape storage; drying of raisins; and certain practical phases of production of wines and related products. The instruction is so designed as to acquaint the students who plan to operate and manage their own vineyards or wineries, to be vineyard foremen, managers, or superintendents, or to work in the inspection and standardization of viticultural products, with the principles and essential skills of grape, raisin, and wine production.

Students who plan to complete the two-year program may take the maximum number of courses offered, and will have least difficulty in arranging schedules if the following courses are taken in the sequence suggested below. Those entering in the spring semester may arrange a similar sequence of courses with the aid of their advisers. Spring entrants may, however, experience difficulty in completing the work in four semesters.

It is urged that students professionally interested in enology qualify for and enter the degree program in order to secure sufficient background to profit by courses in enology.

**First Year**

FALL SEMESTER		SPRING SEMESTER	
<i>Course</i>	<i>Units</i>	<i>Course</i>	<i>Units</i>
Bot. 50. Elementary Botany.....	3	Engl. 50. Business Writing.....	3
Math. 50. Elementary Mathematics.	3	Hist. 57B. History and Institutions of the United States.....	3
Mil. Sci. 51A. Basic (First Year)...	2	Mil. Sci. 51B. Basic (First Year)...	2
Pomol. 51. Fruit Growing.....	3	Soil Sci. 52. Soils.....	3
Elective .....	5	Elective .....	5
	<hr/> 16		<hr/> 16

**Second Year**

FALL SEMESTER		SPRING SEMESTER	
<i>Course</i>	<i>Units</i>	<i>Course</i>	<i>Units</i>
Bot. 51. Weed Control.....	3	Mil. Sci. 52B. Basic (Second Year)	2
Entom. 51. Agricultural Entomology	3	Pl. Path. 52. Plant Diseases.....	3
Irrig. 53. Irrigation Practice.....	3	Vit. 62. Vineyard Operations.....	3
Mil. Sci. 52A. Basic (Second Year)	2	Elective .....	8
Vit. 61. Viticulture.....	3		
Elective .....	3		
	<hr/> 17		<hr/> 16

Six units of agricultural engineering and 12 units of viticulture\* (or 6 units of viticulture and 6 units of pomology) must be included.

**Recommended Electives**

FALL SEMESTER		SPRING SEMESTER	
<i>Course</i>	<i>Units</i>	<i>Course</i>	<i>Units</i>
Agr. Econ. 51. Marketing Agricultural Products .....	3	Agr. Econ. 54. Farm Management..	3
Agr. Econ. 55. Farm Bookkeeping..	3	Agr. Engin. 50. Farm Mechanics... 3	
Agr. Engin. 55. Farm Power.....	3	Agr. Engin. 52. Farm Structures... 3	
Chem. 51. Elementary Chemistry... 3		Agr. Engn. 54. Farm Machinery... 3	
Lands. Man. 51. General Landscape Management .....	4	Agron. 52. Cereals.....	3
Pomol. 53. Orchard Operations....	2	Agron. 54. Forage Crops.....	3
Pomol. 59. Citrus and Other Sub- tropical Fruits .....	3	Entom. 52. Beekeeping .....	3
Vit. 70. Enology Practice.....	1-5	Pomol. 52. Plant Propagation....	2
		Pomol. 54. Orchard Operations....	2
		Vit. 90. Cellar Practice .....	1-5

\* Students interested in enology practice should consult the enology adviser to arrange a program.

# COURSES OF INSTRUCTION

## 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 semester in which the course is given is shown as follows: I, first semester (September to January); II, second semester (February to June); Yr., throughout the first and second semesters. Information concerning class hours will be found in the Schedule and Directory.

*Year courses.* A course given in a period of two semesters is designated by a double number. Home Economics 1A-1B 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.

## CLASSIFICATION AND NUMBERING

Courses are classified and numbered as follows:

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

(2) *Upper division courses* (numbered 100-199). An upper division course is one which is open only to those students who have completed a lower division course, or courses, in that department; or is an elementary course in a subject of such difficulty as to require the maturity of upper division students. Registration in upper division courses in the College of Agriculture is regulated by the possession of the necessary prerequisites rather than by class standing.

Special study courses for advanced undergraduates are numbered 199. Credit in a special study course for undergraduates may not exceed 5 units a semester.

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).

*University Extension courses.*—In the curricula leading to the A.B. and B.S.

degrees, credit is allowed for courses in University of California Extension that bear numbers prefixed by X, XB, XL, or XSB. Such courses are rated, with respect to the general and specific requirements for the bachelor's degree, on the same basis as courses taken in residence at collegiate institutions of approved standing.

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

## AGRICULTURAL CHEMISTRY

For courses in agricultural chemistry see "Chemistry" on page 124.

## AGRICULTURAL ECONOMICS

(Department Office, 7 Temporary Building No. 2)

Raymond G. Bressler, Jr., Ph.D., *Professor of Agricultural Economics (Chairman of the Department) Berkeley campus.*

James M. Tinley, Ph.D., *Professor of Agricultural Economics.*

Edwin C. Voorhies, B.S., *Professor of Agricultural Economics (Vice-Chairman of the Department).*

Trimble R. Hedges, Ph.D., *Associate Professor of Agricultural Economics.*

Jerry Foytik, Ph.D., *Assistant Professor of Agricultural Economics.*

John C. Abbott, Ph.D., *Instructor in Agricultural Economics.*

♥ Edgar L. Haff, Jr., Ph.D., *Instructor in Agricultural Economics.*

Chester O. McCorkle, Jr., Ph.D., *Instructor in Agricultural Economics.*



Russell T. Robinson, B.S., *Lecturer in Agricultural Economics.*

Gordon R. Sitton, B.S., *Lecturer in Agricultural Economics.*

*Letters and Science List.*—Agricultural Economics 120, 125.

*Departmental Major Advisers.*—Mr. McCorkle, Mr. Tinley.

*The Major.*—See page 49.

### LOWER DIVISION COURSE

49. **Field Practice.** (1-6) I and II.

The Staff

Field trips to observe economic aspects of production, processing, handling, or marketing of California agricultural products. Various areas and problems—such as management, tenure, financing, taxation, labor practices, market functions, transportation—will be emphasized on the different trips.

### UPPER DIVISION COURSES

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

100A. **Economic Analysis in Agriculture.** (3) I.

Mr. Foytik

Prerequisite: Economics 1A-1B.

The application of economic principles to problems of agriculture; economic structure and aspects of American agriculture; analysis of demand, supply, and production of agricultural products with particular reference to the individual firm.

100B. **Economic Analysis in Agriculture.** (3) II.

Mr. McCorkle

Prerequisite: course 100A or Economics 100A.

The application of economic principles to the problems of agriculture: economic pricing of agricultural output and productive services, including

♥ On military leave to January 1, 1954.



multiple products, multiple markets and multiple time periods; regional specialization, location and trade; determinants of economic change; effects of economic organization.

106. **Analysis of Agricultural Economic Data.** (3) I. Mr. Foytik  
Lectures and laboratory.  
Prerequisite: Mathematics 13 or Economics 2, Mathematics 11A-11B, or equivalent courses, or consent of the instructor.  
Evaluation and treatment of economic data in agriculture with emphasis on methods of analyzing relations between economic variables.
110. **Agricultural Finance.** (3) I. Mr. Voorhies  
Prerequisite: Economics 1A.  
Farmers' credit needs, methods of financing the agricultural industry, and the agencies supplying agricultural credit.
120. **Agricultural Policy.** (3) II. Mr. Haff  
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.
125. **Comparative Agriculture.** (3) II. Mr. Voorhies  
Prerequisite: Economics 1A.  
The agriculture of certain countries of the world, with special reference to the influence of food supply upon the development of man.
130. **Agricultural Marketing.** (3) I. Mr. Tinley  
Prerequisite: Economics 1A.  
Survey of determinants of agricultural markets and trade. Organization and operation of agricultural markets. Coöperative marketing. Costs of marketing. Government in marketing. Changes in agricultural marketing and markets.
135. **Coöperation in Agriculture.** (3) I. Mr. Tinley  
Types of coöperative agencies; scope and objectives of agricultural co-operation, functions, supply, services, insurance, irrigation, production, consumption, marketing; problems of organization, pooling, management, member relations, financing, taxation, market control, demand creation, cost control; economic effects; legal, political, social aspects.
140. **Farm Management.** (3) I and II. I, Mr. Sitton; II, Mr. Robinson  
Lectures and laboratory.  
Survey of farm management: nature of the farm and the problems and methods of farm management; organizational aspects of the individual farm unit; administration of the farm business.
- 170A. **Economics of Farm Management.** (3) I. Mr. Hedges  
Prerequisite: courses 100A, 140.  
An analytical treatment of farm management: farm organization; management, costs and returns; combination of resources in farm management, and principles of enterprise combination; problems and principles of size; measures and analysis of earning.
- 170B. **Economics of Farm Management.** (3) II. Mr. McCorkle  
Prerequisite: course 170A.  
An analytical treatment of farm management; farm administration and management; tenure; capital structure; market influences; financial analysis; relation of nonfarm influences to farm management.

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

The Staff (Mr. Voorhies in charge)

Prerequisite: senior standing and approval of the department.

Limited to majors in Agricultural Economics with a grade B average or higher.

**AGRICULTURAL ENGINEERING**

(Department Office, 206 Agricultural Engineering Building)

Roy Bainer, M.S., *Professor of Agricultural Engineering (Chairman of the Department).*

Frederick A. Brooks, Sc.D., *Professor of Agricultural Engineering.*

Russell L. Perry, M.E., *Professor of Agricultural Engineering.*

Harry B. Walker, C.E., *Professor of Agricultural Engineering, Emeritus.*

Robert A. Kepner, B.S., *Associate Professor in Agricultural Engineering.*

Coby Lorenzen, Jr., M.S., *Associate Professor of Agricultural Engineering.*

Loren W. Neubauer, Ph.D., *Associate Professor of Agricultural Engineering.*

S. Milton Henderson, M.S., *Assistant Professor of Agricultural Engineering.*

♥George L. Gallaher, M.S., *Instructor in Agricultural Engineering.*

Lloyd H. Lamouria, M.S., *Instructor in Agricultural Engineering.*

Michael O'Brien, Ph.D., *Instructor in Agricultural Engineering.*

Wesley E. Yates, M.S., *Instructor in Agricultural Engineering.*



Norman B. Akesson, M.S., *Lecturer in Agricultural Engineering.*

Llewellyn M. K. Boelter, M.S., *Professor of Engineering (Los Angeles campus).*

Philip R. Bunnelle, M.S., *Lecturer in Agricultural Engineering.*

Robert H. Burgy, M.S., *Assistant Professor of Irrigation.*

Jack T. Gunn, B.S., *Lecturer in Agricultural Engineering.*

Samuel A. Hart, Ph.D., *Lecturer in Irrigation.*

Everett D. Howe, M.S., *Professor of Engineering (Berkeley campus).*

Martin R. Huberty, Engr., *Professor of Irrigation (Los Angeles campus).*

Maynard A. Joslyn, Ph.D., *Professor of Food Technology (Berkeley campus).*

Clarence F. Kelly, M.S., *Lecturer in Agricultural Engineering.*

Arthur S. Leonard, M.S., *Lecturer in Agricultural Engineering.*

Allan A. McKillop, M.S., *Lecturer in Agricultural Engineering.*

John B. Powers, B.S., *Lecturer in Agricultural Engineering.*

Verne H. Scott, M.S., *Assistant Professor of Irrigation.*

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

Herbert A. Young, Ph.D., *Professor of Chemistry.*

**AGRICULTURAL ENGINEERING**

*Departmental Major Advisers.*—Mr. Bainer, Mr. Perry.

*The Major.*—See page 83.

LOWER DIVISION COURSES

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

Mr. Bainer, Mr. Kelly

The development and the application and use of farm machinery; the utilization of power on the farm; elements of hydrology in relation to agri-

♥ On military leave, 1958-1954.

cultural engineering; the economics of farm buildings; elementary problems in the mechanics of agriculture.

14A-14B. **Farm Mechanics for Teachers.** (2-2) Yr. Mr. O'Brien  
Laboratory.

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, farm power, and electrical wiring. Demonstration of methods. A demonstration and laboratory course for majors in agricultural education.

49. **Summer Field Practice.** (6) The Staff (Mr. Perry in charge)

Six weeks' course (first summer session), daily except Sunday, 8-5.

Prerequisite: junior standing in engineering.

Practice in the mechanics, machinery, power, and building laboratories; study of equipment on typical farms. It should be taken after the sophomore or junior year.

#### UPPER DIVISION COURSES

**Physics 2A-2B or 4A-4B** are prerequisite to all upper division courses in agricultural engineering.

102. **Unit Operations in Processing Agricultural Products.** (3) II.

Lectures and laboratory.

Mr. Henderson, Mr. McKillop

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. Lamouria

Lectures and laboratory.

Theory of operation, construction, and utilization of internal combustion engines; tractors; electric motors and appliances. Open to qualified lower division students by permission.

104. **Agricultural Machinery.** (3) I.

Mr. Akesson, Mr. Yates

Lectures and laboratory.

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 and laboratory.

A course in agricultural housing, including structural materials and methods of construction; design of typical farm dwellings, storage buildings, and production structures; farmstead utilities; farmstead arrangement; plans, specifications, contracts and cost estimating.

106. **Heat Transfer in Agricultural Climatic Environment.** (2) II.

Mr. Brooks

Atmospheric and thermal environment of life and structures near the earth's surface. Introduces agricultural climatology and treats solar and nocturnal radiations, thermal convection, diurnal heat flow, cold-air drainage, and frost protection; outdoor condensation and evaporation; dispersion of aerosols.

107. **Problems in Teaching Farm Mechanics.** (3) I and II. Mr. O'Brien

Lecture and laboratory.

Prerequisite: 8 units in Agricultural Engineering; including 14A and

14B. Limited to graduate students in Agricultural Education.

Demonstration and practice in the methods of teaching farm mechanics

in secondary schools. School shop planning including the selection, arrangement, and management of equipment. Curriculum-planning including the relation of teaching materials, references and visual aids.



**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. Lorenzen

Lectures and laboratory.

Prerequisite: Mechanical Engineering 105A, 105B.

The study of the different types of internal combustion engines, their accessories and fuels used for stationary and mobile power on the farm; the construction, operation, and testing of farm tractors, and the application of electric heat, light, and power to agricultural operations.

**114. Agricultural Machinery. (3) I.**

Mr. Kepner

Lectures and laboratory.

Prerequisite: Engineering 35; Mechanical Engineering 102B.

The requirements and design of farmstead and field implements; theory of operation and testing of displacement and centrifugal pumps; field and laboratory studies of representative types of draft and belt-operated farm machines, together with their cost, selection, power requirements, and management.

**115. Farm Structures Design. (3) I.**

Mr. Neubauer

Lectures and laboratory.

Prerequisite: Engineering 35; Mechanical Engineering 102B.

The design of farm buildings including houses, storage buildings, and production structures, with emphasis on functional requirements and characteristics of materials. Study of the principles of lighting, air conditioning, water supply, and sanitation.

**130. Proseminar. (1) II.**

Mr. Bainer, Mr. O'Brien

Professional ethics and social responsibilities of engineers; coöperative research procedures, validity of findings, written and oral presentation of short technical reports.

**198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.**

The Staff (Mr. Bainer in charge)

Prerequisite: senior standing in engineering with at least a B average.

Group study of selected topics. Student groups may be organized in instrumentation and design problems. Students may enroll in one or more separate subjects.

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

The Staff (Mr. Bainer in charge)

GRADUATE COURSE

**299A-299B. Research in Agricultural Engineering. (1-6; 1-6) Yr.**

The Staff

**ENGINEERING**

## LOWER DIVISION COURSES

- 1A. **Plane Surveying.** (3) I. Mr. Burgy  
Lectures and laboratory.  
Prerequisite: plane trigonometry.  
Principles; field practice; calculations and mapping with special reference to irrigation, drainage, and agricultural engineering problems.
22. **Engineering Drawing.** (2) I. Mr. Hart  
Laboratory.  
Prerequisite: plane geometry, trigonometry, and mechanical drawing.  
Freehand pictorials; theory of orthogonal projection; single and multiple auxiliaries; dimensioning; freehand and mechanical working drawings; graphic computations; plotting experimental data and determination of elementary empirical equations.
23. **Descriptive Geometry.** (2) II. Mr. Brooks, Mr. Gunn  
Laboratory.  
Prerequisite: course 22 and Mathematics 3A (which may be taken concurrently).  
The fundamental principles of descriptive geometry and their application to the solution of three-dimensional problems arising in the various branches of engineering.
24. **Advanced Engineering Drawing.** (2) I. Mr. Lorenzen  
Laboratory.  
Prerequisite: course 23.  
Cams and gears; working drawings of machine parts; freehand sketching; structural detailing; piping layouts; and introduction of graphic integration and differentiation.
35. **Statics.** (3) II. Mr. Powers  
Prerequisite: Physics 4A, Mathematics 4A and 4B (Mathematics 4B may be taken concurrently).  
Force systems and equilibrium conditions with emphasis on engineering problems covering structures, distributed forces, beams, cables, and friction. Includes graphical solutions and an introduction to the method of virtual work.
40. **Elementary Metallurgy.** (3) I. Mr. Leonard  
Prerequisite: Chemistry 1A, Physics 4A, 4B or 4C (may be taken concurrently).  
An elementary course for agricultural, industrial, mechanical, and process engineers describing the relationships between microstructure, composition, heat and mechanical treatment, and physical properties of metals and alloys. Heat treatment of steel and nonferrous metals, production of steel, aluminum, and magnesium. Description of many engineering alloys.

**MECHANICAL ENGINEERING**

## UPPER DIVISION COURSES

151. **Industrial Heat Transfer.** (3) I. Mr. Perry  
Prerequisite: course 105A, 105B, or equivalent.  
The study of the basic principles of heat transfer and their application to the design of industrial equipment. Steady-state and transient problems of conduction by analytical and graphical methods. Free and forced convection. Transfer of radiant energy.

152A. **Industrial Mass Transfer.** (3) II.

Mr. Henderson

Prerequisite: course 105A, 105B. Course 151 recommended.

Thermodynamic, heat, and mass transfer principles applied to the unit operations pertaining to processing agricultural products. Analysis and synthesis of processes involving diffusion, evaporation, dehydration, freezing, size reduction, separation, mixing, and materials handling.

**AGRONOMY**

(Department Office, 131 Hunt Hall)

- Fred N. Briggs, Ph.D., *Professor of Agronomy.*  
 John P. Conrad, Ph.D., *Professor of Agronomy.*  
 R. Merton Love, Ph.D., *Professor of Agronomy.*  
 Ben A. Madson, B.S.A., *Professor of Agronomy.*  
 Frederick P. Zscheile, Jr., Ph.D., *Professor of Agronomy.*  
 Robert W. Allard, Ph.D., *Associate Professor of Agronomy.*  
 Horton M. Laude, Ph.D., *Associate Professor of Agronomy.*  
 Maurice L. Peterson, Ph.D., *Associate Professor of Agronomy (Chairman of the Department).*  
 Francis L. Smith, Ph.D., *Associate Professor of Agronomy.*  
 Ernest H. Stanford, Ph.D., *Associate Professor of Agronomy.*  
 Paulden F. Knowles, Ph.D., *Assistant Professor of Agronomy.*  
 Duane S. Mikkelsen, Ph.D., *Assistant Professor of Agronomy.*  
 Charles W. Schaller, Ph.D., *Assistant Professor of Agronomy.*  
 Dale G. Smeltzer, Ph.D., *Assistant Professor of Agronomy.*  
 William A. Williams, Ph.D., *Instructor in Agronomy.*



- David Ririe, Ph.D., *Lecturer in Agronomy.*  
 Dorman C. Sumner, B.S., *Lecturer in Agronomy.*

*Departmental Major Advisers.*—Mr. Laude, Mr. Stanford.  
*The Major.*—See page 60.

## LOWER DIVISION COURSES

**1. Introduction to Agronomy.** (3) I.

Mr. Smeltzer

Lectures and laboratory.

The principles and practices of field crop production and soil management; a survey of the production and uses of field crops including pastures and other forages, cereals, edible legumes, oil, fiber, sugar, and green manure crops; laboratories and field trips to familiarize the student with production methods, plants and seeds, processing, and quality of field crops.

**2. Forage Crops.** (3) II.

Mr. Williams

Lectures and laboratory.

Prerequisite: course I recommended.

Adaptation, establishment, management, and utilization of forage plants as irrigated pasture, range, hay, and silage; aspects of forage quality which affect feeding value to livestock. Field trips will be arranged to observe developments in irrigated pasture management and range improvement.

## UPPER DIVISION COURSES

110. **Principles of Crop Production.** (3) I. Mr. Laude  
Prerequisite: Chemistry 8, Botany 1.  
The relation of environment to the distribution and utilization of field crops. The theory of soil management and improvement, fertilization, rotation, erosion control, tillage, and other practices relating to the production of field crops.
111. **Small Grains, Corn, Sorghum, and Beans.** (3) II. Mr. Knowles  
Lectures and laboratory.  
Prerequisite: course 110.  
Adaptation, distribution, culture, utilization, processing and other factors determining quality of wheat, oats, barley, rye, rice, corn, sorghum, and field beans.
112. **Hay and Pasture Production.** (3) II. Mr. Peterson  
Lectures and laboratory.  
Prerequisite: course 110.  
The adaptation, management, and utilization of hay crops, irrigated pastures, and other harvested forages; factors which determine quality and value of forages.
113. **Cotton, Sugar Beets and Miscellaneous Crops.** (3) I. Mr. Ririe  
Lectures and laboratory.  
Prerequisite: course 110.  
Adaptation, distribution, culture, utilization, processing and other factors determining quality of cotton and other fiber crops, sugar crops, oil crops, and other miscellaneous crops.
114. **Plant Breeding.** (3) II. Mr. Stanford  
Lectures and laboratory.  
Prerequisite: Genetics 100. Course 111 or 113, or Botany 108, or Vegetable Crops 105 recommended.  
The application of genetics to the problems and methods of plant improvement.
115. **Range Improvement.** (3) II. Mr. Love  
Lecture and laboratory.  
Prerequisite: course 110.  
Adaptation, distribution, growth habits, and utilization of the more important forage and grazing plants, with special emphasis on their systematic relationships. Principles of the artificial establishment and management of ranges and nonirrigated pastures. Special field trips will be arranged.
130. **Quantitative Inheritance in Plant Breeding.** (3) I. Mr. Allard  
Lectures and laboratory.  
Prerequisite: Genetics 102 (given on the Berkeley campus) or Mathematics 105; and a course in plant breeding.  
The genetic theory underlying quantitative inheritance; theory of inbreeding and heterosis; effects of selection upon populations; applications to plant improvement.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Peterson in charge)  
Prerequisite: 6 upper division units of agronomy.

RELATED COURSES

Weed Control (Botany 107)

Principles Underlying Irrigation in Its Soil and Plant Relationships (Irrigation 100)

Irrigation Principles and Practices (Irrigation 110)

The Soil as a Medium for Plant Growth (Soil Science 110)

Diseases of Crop Plants (Plant Pathology 125A-125B)

Advanced Plant Biochemistry (Chemistry 151, 152)

Elementary Statistics (Mathematics 13)

Statistical Methods for Biologists (Mathematics 105)

Other courses related to agronomy are given in the departments of Agricultural Economics, Agricultural Engineering, Animal Husbandry, Botany, Genetics, and Soil Science.

GRADUATE COURSE

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

The Staff (Mr. Peterson in charge)

**ANIMAL HUSBANDRY**

(Department Office, 128 Animal Science Building)

Harold H. Cole, Ph.D., *Professor of Animal Husbandry (Chairman of the Department)*.

Harold Goss, Ph.D., *Professor of Animal Husbandry.*

Paul W. Gregory, Sc.D., *Professor of Animal Husbandry.*

Carroll E. Howell, M.S., *Professor of Animal Husbandry.*

Max Kleiber, D.Sc., *Professor of Animal Husbandry.*

Sylvester W. Mead, M.S., *Professor of Animal Husbandry.*

James F. Wilson, M.A., LL.D., *Professor of Animal Husbandry.*

William M. Regan, M.S., *Professor of Animal Husbandry, Emeritus.*

Floyd D. Carroll, Ph.D., *Assistant Professor of Animal Husbandry.*

Perry T. Cupps, Ph.D., *Assistant Professor of Animal Husbandry.*

Hubert Heitman, Jr., Ph.D., *Assistant Professor of Animal Husbandry.*

Robert C. Laben, Ph.D., *Assistant Professor of Animal Husbandry.*

Glen P. Lofgreen, Ph.D., *Assistant Professor of Animal Husbandry.*

James H. Meyer, Ph.D., *Assistant Professor of Animal Husbandry.*

Wade C. Rollins, Ph.D., *Assistant Professor of Animal Husbandry.*

William C. Weir, Ph.D., *Assistant Professor of Animal Husbandry.*

Daniel W. Cassard, Ph.D., *Instructor in Animal Husbandry.*

James M. Boda, B.S., *Acting Instructor in Animal Husbandry.*



Arthur L. Black, Ph.D., *Instructor in Veterinary Medicine.*

Arthur H. Smith, Ph.D., *Assistant Professor of Poultry Husbandry.*



*Letters and Science List.*—Animal Husbandry 101, 110, 125, 130.

*Departmental Major Advisers.*—Mr. Cupps, Mr. Heitman, Mr. Lofgreen, Mr. Mead, Mr. Meyer, Mr. Weir.

*The Major.*—See page 52.

#### LOWER DIVISION COURSES

7. **Introduction to Animal Husbandry.** (3) I. Mr. Heitman  
A survey of the sources of the world's supply of animal products, the distribution of domestic animals in the United States and factors influencing this; the origin, characteristics, and adaptation of the more important breeds and the influence of environment upon their development.
8. **Livestock Judging and Selection.** (1) I. Mr. Meyer  
Laboratory.  
Prerequisite: course 7, which may be taken concurrently.  
The animal form in relation to its various functions.

#### UPPER DIVISION COURSES

101. **Animal Biochemistry.** (3) II. Mr. Goss  
Prerequisite: Chemistry 8.  
The chemistry of animal food constituents, tissues, hormones, and excretory products; chemistry of enzymes and digestion; the fate of foodstuffs in metabolism; survey of fundamentals of blood chemistry.
102. **Animal Biochemistry Laboratory.** (3) II. Mr. Goss, Mr. Lofgreen  
Lecture and laboratory.  
Prerequisite: Chemistry 8; course 101 (may be taken concurrently); Chemistry 5 is recommended.
103. **Animal Nutrition—Feeds and Feeding.** (3) I. Mr. Weir  
Prerequisite: Chemistry 8.  
The composition and use of feedstuffs in their relation to the feeding of farm animals, including the selection of rations.
- 104A–104B. **Livestock Management and Practices.** (1) I and II. Mr. Cassard  
Laboratory.  
Prerequisite: courses 7 and 8.  
A course designed to give modern concepts regarding identification of animals, work simplification in the care of animals, arrangement of management operations to fit in with seasonal conditions and means of keeping adequate breeding and production records.
108. **Milk Production.** (4) II. Mr. Laben  
Lectures and laboratory. Occasional field trips.  
Prerequisite: course 103.  
Study of the application 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. Boda  
Lectures and laboratory.  
Prerequisite: Chemistry 8; Zoölogy 1A, 1B.  
The physiology of the neuromuscular, central nervous, circulatory, respiratory, digestive, endocrine, reproductive, and excretory systems.

111. **Advanced Livestock Judging.** (2) I. Mr. Cassard, Mr. Heitman  
Laboratory. Occasional field trips.  
Prerequisite: courses 7, 8.  
The relation of form to function. Training in the selection of beef cattle, sheep, hogs, and horses. Some carcass study of meat animals.
112. **Advanced Dairy Cattle Production.** (2) I. Mr. Mead  
Laboratory.  
Prerequisite: course 108.  
A study of the factors involved in milk production with special emphasis on recent scientific literature on breeding, nutrition, physiology, and management. Laboratory work includes analyses of dairy records and field trips.
113. **Wool Technology.** (2) I. Mr. Wilson  
Prerequisite: courses 7, 8.  
Survey of world production and consumption of wool; a study of its physical properties; marketing of the clip; grading, scouring, drying; principles of manufacture.
114. **Wool Technology Laboratory.** (2) I. Mr. Wilson  
Lecture and laboratory.  
Prerequisite: courses 7, 8, 113 (may be taken concurrently).  
Microscopic structure of wool and other textile fibers; judging the shorn and unshorn fleece, grading the clip, scouring.
115. **Horse Production.** (3) II. Mr. Howell  
Prerequisite: course 103.  
Care, feeding, management, and problems of production of all classes of horses. Developing successful breeding programs. The use of horses for power and pleasure.
117. **Physiology of Reproduction.** (3) II. Mr. Cupps  
Lectures and laboratory.  
Prerequisite: course 110.  
The physiological mechanisms related to reproduction, breeding efficiency and fertility with special reference to domestic animals.
118. **Meat Production.** (4) II. Mr. Carroll  
Lectures and laboratory. Occasional field trips.  
Prerequisite: course 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.
120. **Advanced Animal Nutrition.** (3) I. Mr. Kleiber  
Prerequisite: course 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.
125. **Population Genetics.** (3) II. Mr. Rollins  
Lectures and laboratory.  
Prerequisite: Genetics 100; Mathematics 13 or 105 or equivalent course in statistics.  
The application of modern genetics to livestock improvement; the princi-

ples underlying inbreeding, outbreeding, assortative mating, mass selection, progeny testing, and family selection.

Given in the spring semester of even-numbered years.

130. **Physiology of the Endocrine Glands.** (3) II. Mr. Cole  
Prerequisite: course 110 or equivalent.

Control of endocrine secretion and the physiological effects of the hormones with emphasis on endocrine problems relating to domestic animals.

143. **Use of Isotopes as Tracers in Biological Research.** (2) II.

Mr. Kleiber, Mr. Black, Mr. Smith

Prerequisite: Physiology or Biochemistry (plant or animal). Recommended: calculus; Physics 121; course 120; Bacteriology 103.

Discussion and demonstration of the use of isotopes as tracers particularly in the study of metabolic processes in organisms.

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

The Staff (Mr. Cole in charge)

#### RELATED COURSES

**Principles of Pathology and Control of Diseases of Domestic Animals** (Veterinary Science 111)

**Poultry Pathology Laboratory** (Veterinary Science 112)

#### GRADUATE COURSES

200A-200B. **Research in Animal Husbandry, Animal Nutrition, Animal Physiology, or Animal Genetics.** (1-6; 1-6) Yr. The Staff

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

## ART

For courses in art see "Philosophy and Fine Arts" on page 163.

## BACTERIOLOGY

(Department Office, 1076C Veterinary Science Building)

Courtland S. Mudge, Ph.D., *Professor of Bacteriology (Chairman of the Department).*

Donald M. Reynolds, Ph.D., *Assistant Professor of Bacteriology.*

\*Mortimer P. Starr, Ph.D., *Assistant Professor of Bacteriology.*

Allen G. Marr, Ph.D., *Instructor in Bacteriology.*

—, *Acting Instructor in Bacteriology.*

*Letters and Science List.*—All undergraduate courses in bacteriology are included in the Letters and Science List of Courses (see pages 79-80).

*The Major in Microbiology.*—To permit a broader training than possible within the usual major in bacteriology, a major in microbiology is offered. This permits a proper balance of studies in bacteriology with the auxiliary chemical and biological sciences.

*Major Adviser.*—Mr. Reynolds.

*Preparation for the Major.*—Required: Bacteriology 1; Botany 1; Chemistry 1A, 1B, 5, and 8; Physics 2A, 2B; Zoölogy 1A. Recommended: Botany 14;

\* Absent on leave, 1953-1954.

Chemistry 9; Mathematics 11A-11B; Physiology 1, 1L; Public Health 5A, 5B; elementary courses in German and French.

*The Major.*—Required: Bacteriology 100 and at least 5 units of other upper division courses in bacteriology; Chemistry 101, 102. In addition, at least 9 units from the following list with the approval of the major adviser (in special cases, substitutions may be permitted): Bacteriology 103, 103L, 104, 105, 199; Chemistry 109, 151, 152; Dairy Industry 142; Food Technology 116, 117; Genetics 100; Plant Pathology 124A, 124B; Veterinary Science 124; Zoölogy 110.

All courses required for the major must be completed with at least a grade of C.

#### LOWER DIVISION COURSES

1. **Introductory Bacteriology and Microbiology.** (5) II. Mr. Reynolds  
Lectures and laboratory.  
Prerequisite: Chemistry 1A, 8; one course in botany, zoölogy, or physiology (Botany 1 or 12, Zoölogy 1A or 10, Physiology 1, or equivalent).  
A general introduction to microbiology suggested for students majoring in bacteriology and in closely related fields.
2. **General Bacteriology.** (4) I. Mr. Mudge  
Lectures and laboratory.  
Prerequisite: Chemistry 1A; Botany 1 or 12 or Zoölogy 1A or 10.  
Morphology, classification, ecology, and metabolism of microörganisms; 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.

#### UPPER DIVISION COURSES

100. **Advanced Bacteriology.** (5) I. Mr. Marr  
Lectures and laboratory.  
Prerequisite: course 1 (or course 2 with the consent of the instructor); Chemistry 8. Recommended: Mathematics 11A-11B.  
Lectures and laboratory on selected topics in growth and adaptation of microörganisms, cytology, effects of the physico-chemical environment, microbial genetics, immunochemistry and pathogenesis.
103. **Microbial Metabolism.** (2) I. Mr. Marr, Mr. Bovell  
Prerequisite: course 1 or 2; biochemistry (Chemistry 101, Animal Husbandry 101, or equivalent).  
A survey of the metabolic activities of microbes.
- 103L. **Laboratory in Microbial Metabolism.** (2) I. Mr. Marr, Mr. Bovell  
Laboratory.  
Prerequisite: course 103 (which should be taken concurrently), and consent of the instructor.  
A laboratory illustrating the methods of study of microbial metabolism. This course is designed to supplement course 103.
- \*104. **Advanced General Microbiology.** (4) I. Mr. Starr  
Lectures and laboratory.  
Prerequisite: course 1 (or course 2 with the consent of the instructor); Chemistry 8.  
Intensive study of selected groups of microbes, techniques of enrichment culture, ecology, and principles of classification.

\* Not to be given, 1953-1954.

105. **Technical Microbiology.** (3) II.

Mr. Reynolds

Prerequisite: course 1 or 2; Chemistry 1A-1B, 8.

Relationships of bacteria, yeasts, molds, and actinomycetes to technological processes such as production of industrial alcohol, vinegar, solvents, and antibiotics; preparation of vitamins and enzymes.

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

The Staff (Mr. Mudge in charge)

Prerequisite: consent of the instructor based on adequate preparation of the student in allied fields.

Investigation of special problems.

## GRADUATE COURSES

201. **Special Study and Research in Microbiology.** (1-6) I and II.

Resident members of the Graduate Group in Microbiology  
(Mr. Starr in charge)

202. **Seminar in Bacteriology and Microbiology** (1) I and II. The Staff203. **Selected Topics in Microbial Metabolism.** (2) II.

Mr. Marr

Prerequisite: course 103.

Lectures and discussions on metabolic pathways of microbes, comparative biochemistry, and microbial enzymology.

**BOTANY**

(Department Office, 2 Botany Building)

Vernon I. Cheadle, Ph.D., *Professor of Botany (Chairman of the Department)*.Alden S. Crafts, Ph.D., *Professor of Botany*.Katherine Esau, Ph.D., *Professor of Botany*.T. Elliot Weier, Ph.D., *Professor of Botany*.Herbert B. Currier, Ph.D., *Associate Professor of Botany*.Clifford R. Stocking, Ph.D., *Associate Professor of Botany*.Ernest M. Gifford, Jr., Ph.D., *Assistant Professor of Botany*.John M. Tucker, Ph.D., *Assistant Professor of Botany*.William H. English, Ph.D., *Associate Professor of Plant Pathology*.George Nyland, Ph.D., *Assistant Professor of Plant Pathology*.Edgar P. Painter, Ph.D., *Associate Professor of Chemistry*.Frederick P. Zscheile, Jr., Ph.D., *Professor of Agronomy*.

*Letters and Science List.*—All undergraduate courses except Botany 8 and 107 are included in the Letters and Science List of Courses (see pages 79-80).

*Departmental Major Adviser.*—Mr. Stocking.

*Preparation for the Major.*—Required: Botany 1 and Chemistry 1A, 8. If the lower division program is crowded, the student may postpone Chemistry 8 until he reaches the upper division, provided it is taken before Botany 7.

*Recommended.*—German, French, Physics 2A, 2B, 3A, 3B; elementary courses in other biological sciences.

*The Major.*—The courses in botany are organized on levels of increasing

specialization corresponding to the elementary, intermediate, and the advanced stages of instruction. Requirements for the major are: the elementary course, Botany 1; the intermediate courses, Botany 7, 14, 16, and 108; and advanced botany courses amounting to an additional 14 units.

#### LOWER DIVISION COURSES

##### 1. General Botany. (5) I and II.

Mr. Weier, Mr. Stocking, Mr. Tucker, Mr. Gifford

I. (Stocking). Lectures and laboratory.

II. (Weier). Lectures and laboratory.

An introduction to the morphology, physiology, and genetics of flowering plants; brief survey of the plant kingdom including fungi causing plant diseases.

##### 7. Introduction to Plant Physiology. (4) II.

Mr. Stocking

Prerequisite: course 1, Chemistry 1A-1B; Chemistry 8 recommended.

The fundamental activities of plants, such as absorption, transpiration, synthesis of foods, respiration, growth, movement, and reproduction.

##### 8. Poisonous Plants. (2) II.

Mr. Tucker

Lecture and laboratory.

Identification, distribution, toxic principles, nature of injury and animals affected, and plant control measures.

##### 14. Comparative Morphology of Nonvascular Plants. (4) II.

Mr. Gifford

Lectures and laboratory.

Prerequisite: course 1, or Bacteriology 1, or equivalent.

Introduction to structure and reproduction of the algae, fungi, and bryophytes; special emphasis on the cytology, physiology, and economic importance of fresh-water and marine algae; field trips.

##### 16. Comparative Morphology of Vascular Plants. (4) I.

Mr. Gifford

Lectures and laboratory.

Prerequisite: course 1 or equivalent.

Introduction to structure, reproduction, and evolution of the major groups of living and extinct vascular plants; special emphasis on development of pollen, embryo, seed, and fruit of seed plants.

#### UPPER DIVISION COURSES

In addition to requirements specifically noted, the prerequisite for all upper division courses is Botany 1.

#### Morphology and Taxonomy

##### 105. Plant Anatomy. (4) I.

Miss Esau

Lectures and laboratory.

Prerequisite: course 1.

Structure and growth of meristems; development and structure of cells, tissues, and tissue systems; comparative anatomy of stem, root, and leaf.

##### 107. Weed Control. (4) II.

Mr. Crafts

Lectures and laboratory.

Prerequisite: course 1, Chemistry 1A-1B.

Introduction and spread of weeds; cultural, cropping, biological, and chemical methods of control.

**108. Systematic Botany of Flowering Plants. (3) II.** Mr. Tucker

Lecture and laboratory.

Prerequisite: course 1.

Laboratory and field studies of the characters and relationships of the principal families and genera of flowering plants. Principles of taxonomy. Practice in identification of species by means of keys.

## RELATED COURSE

**Pathogenic Fungi** (Plant Pathology 124A-124B)**Plant Physiology and Plant Biochemistry****120A-120B. Plant Physiology. (2-2) Yr.** Mr. Currier

Prerequisite: course 1, Chemistry 8. Recommended: Chemistry 5. Course

121A-121B should be taken concurrently.

The cell as a physicochemical system, water relations, mineral nutrition, translocation; plant metabolism including enzymes, photosynthesis, respiration, and various aspects of growth.

**121A-121B. Plant Physiology Laboratory. (2-2) Yr.** Mr. Currier

Laboratory.

Prerequisite: course 1, Chemistry 8. Recommended: Chemistry 5.

To be taken concurrently with Botany 120A-120B.

## RELATED COURSES

**General Biochemistry** (Chemistry 101)**Biochemistry Laboratory** (Chemistry 102)**Advanced Plant Biochemistry** (Chemistry 151)**Advanced Plant Biochemistry Laboratory** (Chemistry 152)**Cytology and Genetics****130. Plant Cytology. (4) I.** Mr. Weier

Lectures and laboratory.

Prerequisite: Genetics 100.

The structure and function of the cytoplasm and cytoplasmic bodies; detailed studies of the nucleus, mitosis, and meiosis; chromosome structure and chemistry; chromosome aberrations.

**131. Chromosome Techniques. (2) II.** Mr. Weier

Laboratory.

Prerequisite: course 130 or equivalent, and permission of the instructor.

A technique course devoted to methods used in the preparation of chromosomes for detailed study. Laboratory work to consist of preparation of temporary and permanent chromosome smears by various methods, preparation of illustrations for publications, including photomicrographs.

## RELATED COURSES

**Principles of Genetics** (Genetics 100)**Principles of Genetics Laboratory** (Genetics 100C)

**General Courses**

155. **Plant Microtechnique.** (2) I. Mr. Gifford  
Laboratory.  
Prerequisite: course 16 or 105, or equivalent.  
Introduction to theory and practical laboratory methods in preparing plant materials for microscopic examination.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Cheadle in charge)

**GRADUATE COURSES**

- 200A-200B. **Research in Botany.** (1-6; 1-6) Yr. The Staff
203. **Seminar in Plant Physiology.** (1) I and II.  
I. Mr. Stocking; II. Mr. Currier  
Survey and discussion of recent developments in the field of plant physiology at the graduate level.
208. **Seminar in Plant Morphology.** (1) II. Miss Esau  
Survey and discussion of recent developments in the field of plant morphology at the graduate level.

**BUSINESS ADMINISTRATION**

For courses in business administration see "Economics, Geography, and Sociology" on page 129.

**CHEMISTRY**

(Department Office, 31 Chemistry Building)

- Harold G. Reiber, Ph.D., *Professor of Chemistry (Chairman of the Department)*.
- Herbert A. Young, Ph.D., *Professor of Chemistry.*
- \*Lawrence J. Andrews, Ph.D., *Associate Professor of Chemistry.*
- Raymond M. Keefer, Ph.D., *Associate Professor of Chemistry.*
- Edgar P. Painter, Ph.D., *Associate Professor of Chemistry.*
- David H. Volman, Ph.D., *Associate Professor of Chemistry.*
- Thomas L. Allen, Ph.D., *Assistant Professor of Chemistry.*
- Robert K. Brinton, Ph.D., *Assistant Professor of Chemistry.*
- Richard E. Kepner, Ph.D., *Assistant Professor of Chemistry.*



Frederick P. Zscheile, Jr., Ph.D., *Professor of Agronomy.*

\* Absent on leave, 1953-1954.



## AGRICULTURAL CHEMISTRY

## GRADUATE COURSES

## 200A-200B. Seminar in Agricultural Chemistry. (1-1) Yr.

The Staff (Mr. Reiber in charge)

Members of the Group in Agricultural Chemistry at Davis.\*

One seminar is offered during each semester. One weekly meeting is held. The subject will vary from semester to semester and will be announced at the beginning of each one.

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

The Staff (Mr. Reiber in charge)

Members of the Group in Agricultural Chemistry.\*

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

## CHEMISTRY

*Letters and Science List.*—All undergraduate courses in Chemistry are included in the Letters and Science List of Courses (see pages 79-80).

*Major Subject Adviser.*—Mr. Keefer.

*Preparation for the Major.*—The recommended preparation is as follows: Chemistry 1A-1B, and one or more of courses 5, 112A and 112B; Physics 4A, 4B, 4C; Mathematics 3A-3B, 4A-4B; and a reading knowledge of German.

The above-mentioned courses, though recommended, are actually required only in so far as they constitute prerequisites for courses included in the major. Prospective major students should familiarize themselves with such prerequisites, and with the possible course sequences involved. Thus, Mathematics 4A is prerequisite to Chemistry 110A, which in turn is a requirement of the major and is prerequisite to many upper division courses in chemistry.

High school students should note that the preparation for the major is simplified if their high school programs include chemistry, physics, four years of mathematics, and two years of German.

*The Major.*—The major consists of 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 Chemistry 105, 110A-110B, 111, and 112B.

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.

*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 Chemistry 114H and 180H or other advanced courses approved by the departmental Committee on Honors.

\* See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

## LOWER DIVISION COURSES

- 1A. General Chemistry.** (5) I and II.  
Mr. Keefer, Mr. Reiber, Mr. Andrews, Mr. Brinton,  
Mr. Kepner, Mr. Painter, Mr. Volman, Mr. Allen  
I. (Keefer). Lectures and laboratory.  
II. (Reiber). Lectures and laboratory.  
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.
- 1B. General Chemistry (Qualitative Analysis).** (5) I and II.  
Mr. Allen, Mr. Volman, Mr. Reiber, Mr. Andrews, Mr. Brinton,  
Mr. Keefer, Mr. Kepner, Mr. Painter  
I. (Allen). Lectures and laboratory.  
II. (Volman). Lectures and laboratory.  
Prerequisite: course 1A.
- 5. Quantitative Analysis.** (3) I. Mr. Brinton  
Lecture and laboratory.  
Prerequisite: course 1B with a grade of C or higher.  
A short course dealing with the principles and methods of quantitative  
analysis.
- 8. Short Survey of Organic Chemistry.** (3) I and II.  
I. Mr. Reiber; II. Mr. Andrews  
Prerequisite: course 1A or 1B with a grade of C or higher.  
An introductory study of the compounds of carbon.
- 9. Methods of Organic Chemistry.** (3) I. Mr. Kepner  
Lecture and laboratory.  
Prerequisite: course 1B with a grade of C or higher and course 8, which  
should be taken concurrently.  
An experimental study of the physical properties and chemical reactions  
of the common classes of organic substances.

## UPPER DIVISION COURSES

- 101. General Biochemistry.** (3) II. Mr. Painter  
Prerequisite: course 8 or 112A with a grade of C or higher, or consent  
of the instructor.  
The chemistry of carbohydrates, fats, proteins, amino acids, nucleic acids,  
and related compounds in plant and animal tissues. The role of these com-  
pounds in life processes.
- 102. Biochemistry Laboratory.** (2) II. Mr. Painter  
Laboratory.  
Prerequisite: course 5 or 112B, and 101, which may be taken concurrently.
- 105. Advanced Quantitative Analysis.** (3) II. Mr. Brinton  
Lecture and laboratory.  
Prerequisite: course 5.
- 109. Physical Chemistry, Brief Course.** (3) II. Mr. Young  
Prerequisite: course 5; one year of college physics.  
Graduate students of high standing may, under exceptional circumstances,  
be admitted without the prerequisite course in chemistry.  
Selected topics in physical chemistry.

- 110A-110B. **Physical Chemistry.** (3-3) Yr. Mr. Keefer, Mr. Volman  
 110A. Mr. Volman.  
 110B. Mr. Keefer.  
 Prerequisite: course 5, Mathematics 4A, and Physics 4B. Physics 4B may be taken concurrently.  
 The general principles of physical chemistry and elementary thermodynamics.
111. **Physical Chemistry.** (3) I. Mr. Keefer  
 Laboratory.  
 Prerequisite: courses 110A and 110B (110B may be taken concurrently), or course 109; and calculus.  
 Physicochemical measurements and laboratory experiments illustrating some of the important principles of physical chemistry.
- 112A-112B. **General Organic Chemistry.** (5-5) Yr.  
 112A. Mr. Andrews. Mr. Andrews, Mr. Kepner  
 112B. Mr. Kepner.  
 Lectures and laboratory.  
 Prerequisite: course 1B with a grade of C or higher.  
 Lectures and laboratory work designed primarily for students whose major is chemistry. The course is open to qualified students in other majors who wish a broader coverage of organic chemistry than is presented in Chemistry 8 and 9.
113. **Physical Biochemistry.** (3) II. Mr. Volman  
 Prerequisite: course 109 or consent of the instructor.  
 Physical chemistry of biological systems.
- 114H. **Physical Chemistry—Thermodynamics.** (3) I. Mr. Young  
 Prerequisite: courses 5, 110A-110B; Physics 4C or equivalent; familiarity with differential and integral calculus. Restricted to honor students.  
 The principles of thermodynamics, with examples of their application to chemistry.
124. **Advanced Inorganic Chemistry.** (3) II. Mr. Allen  
 Lectures and laboratory.  
 Prerequisite: courses 105, and 109 or 110B.  
 Equilibria and reaction rates; periodic classification.
130. **Qualitative Organic Analysis.** (3) II. Mr. Kepner  
 Lecture and laboratory.  
 Prerequisite: courses 5, 8 and 9.  
 The application of physical and chemical techniques to the qualitative identification of organic compounds.
133. **Advanced Organic Chemistry.** (3) I.  
 Mr. Kepner, Mr. Reiber, Mr. Andrews  
 Prerequisite: courses 8 and 9 or 112B; 109 or 110B.  
 Modern concepts of substitution, elimination and addition reactions, rearrangements, and stereochemistry.
151. **Advanced Plant Biochemistry.** (2) I. Mr. Zscheile  
 Prerequisite: course 8 and one course in biochemistry.  
 Discussion of selected topics concerning the chemistry of plant constituents, with emphasis on the physiological and physical aspects of their biochemistry.

152. **Advanced Plant Biochemistry Laboratory.** (2) II. Mr. Zscheile  
Laboratory.  
Prerequisite: courses 5, 9, and 151 or their equivalents.  
Laboratory experience in isolation of typical plant constituents and in their analysis. Introduction to research methods by study of individual problems.

- 180H. **Undergraduate Research.** (2-5) I and II.  
Prerequisite: course 110B. The Staff (Mr. Reiber in charge)  
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.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Reiber in charge)  
Prerequisite: consent of the instructor based upon adequate preparation in chemistry, mathematics, and physics.  
Investigation of special problems to be selected according to the preparation and needs of the individual.

## GRADUATE COURSES

280. **Research.** (2-9) I and II. The Staff  
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 department 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.
290. **Seminar.** (1) I and II. I. Mr. Volman; II. Mr. Brinton  
Prerequisite: consent of instructor.  
The subjects covered will vary from year to year and will be announced at the beginning of each semester.

## CLASSICS

For courses in classics, see "Foreign Languages" on page 140.

## DAIRY INDUSTRY

(Department Office, 209 Dairy Industry Building)

\*Eugene L. Jack, Ph.D., *Professor of Dairy Industry (Chairman of the Department)*.

Chester L. Roadhouse, D.V.M., *Professor of Dairy Industry, Emeritus.*

Walter L. Dunkley, Ph.D., *Associate Professor of Dairy Industry.*

Nikita P. Tarassuk, Ph.D., *Associate Professor of Dairy Industry.*

\* Absent on leave, July to December 31, 1953.

Edwin B. Collins, Ph.D., *Assistant Professor of Dairy Industry.*

Thomas A. Nickerson, Ph.D., *Assistant Professor of Dairy Industry.*



Bruce E. Hubbell, Jr., B.S., *Lecturer in Dairy Industry.*

Clement A. Phillips, M.S., *Lecturer in Dairy Industry.*

*Departmental Major Adviser.*—Mr. Dunkley.

*The Major.*—See page 56.

#### LOWER DIVISION COURSES

##### 1. Principles of Dairying. (3) I.

Mr. Phillips

The composition and properties of milk and their influence on the principles of dairy products processing. The importance of the milk constituents in human nutrition. Some economic aspects of the dairy industry in California.

##### 2. Laboratory in Principles of Dairying. (1) I.

Mr. Tarassuk

Laboratory.

Prerequisite: course 1, which may be taken concurrently.

A laboratory course to accompany course 1; primarily for dairy industry majors. Identification and properties of the constituents of milk, laboratory tests of milk and milk products; study of dairy processing.

##### 49. Summer Practice and Observation Course. (No credit)

The Staff (Mr. Hubbell in charge)

Daily, except Sunday, 8–5, six weeks. Required of all students whose major is dairy industry, unless proof of equivalent experience can be shown.

Prerequisite: course 1.

Practice in processing dairy products, including market milk, butter, cheese, ice cream, and concentrated milks. Applications of laboratory control and some practice in equipment maintenance.

#### UPPER DIVISION COURSES .

##### 101A–101B. Principles of Dairy Processing Operations. (5–5) Yr.

I. Mr. Dunkley; II. Mr. Phillips, Mr. Nickerson

Lectures and laboratory.

Prerequisite: courses 1, 2; 107A–107B to be taken concurrently. Course 101A is prerequisite to 101B.

The principles of dairy products processing operations. Dairy plant practices in market milk, condensed and dry milk, ice cream, cheese, butter and specialty products. Standardization, packaging, and dairy inspection.

##### 106. Chemistry of Milk and Dairy Products. (4) II.

Mr. Tarassuk

Lectures and laboratory.

Prerequisite: Chemistry 1A–1B, 8.

The physical, physicochemical, and chemical properties of milk and milk products, and their relation to the manufacture and quality of dairy products.

##### 107A–107B. Laboratory Control for Dairy Plants. (2–2) Yr.

Lecture and laboratory.

Mr. Collins, ———

Prerequisite: course 1; Chemistry 5; 101A–101B to be taken concurrently.

A course in laboratory technique to be taken concurrently with course 101A–101B. Bacteriological and chemical control practices in the manufacture of dairy products, including tests for quality, adulteration, and evaluation of detergents and chemical sterilizers.

142. **Dairy Bacteriology.** (3) I. Mr. Collins  
Lecture and laboratory.  
Prerequisite: Chemistry 1A, 1B; Bacteriology 1.  
The bacteria found in milk and other dairy products; their ways of entry; methods used in determining their number; effect of pasteurization and other processes on bacteria.
- 160A-160B. **Proseminar.** (1-1) Yr. I. Mr. Phillips; II. Mr. Jack  
160A. Proseminar in determining the quality of dairy products and identifying defects.  
160B. Proseminar in assigned and selected topics.  
Required of all dairy industry majors in their senior year.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Jack in charge)

GRADUATE COURSES

- 200A-200B. **Research in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology.** (1-6; 1-6) Yr. The Staff
- 201A-201B. **Seminar in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology.** (1-1) Yr. I. Mr. Dunkley; II. \_\_\_\_\_  
Required of all students enrolled in course 200A-200B.

**DECORATIVE ART**

Four courses in decorative art, see "Home Economics" on page 151.

**DRAMATIC ART**

For courses in dramatic art, see "English, Dramatic Art, Speech" on page 134.

**ECONOMICS, GEOGRAPHY, AND SOCIOLOGY**

(Department Office, 3 Temporary Building No. 5)

- Herbert A. Young, Ph.D., *Professor of Chemistry (Acting Chairman of the Department).*  
Arnold Brekke, Ph.D., *Lecturer in Economics.*  
Michael McLaughlin, M.A., *Acting Instructor in Business Administration.*  
\_\_\_\_\_, *Acting Instructor in Economics.*

**BUSINESS ADMINISTRATION**

*Letters and Science List.*—Business Administration 1A, 1B.

LOWER DIVISION COURSE

- 1A-1B. **Principles of Accounting.** (3-3) Yr. \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite: sophomore standing. 1A is prerequisite to 1B.

## UPPER DIVISION COURSE

**131. Corporation Finance. (3) I.**

Prerequisite: course 1A-1B.

The corporation as one form of business organization; financial aspects of promotion and organization, operation as a going concern, expansion and consolidation, failure and reorganization; the capital market, financial instruments and institutions; public regulation of security issues and security exchanges.

**ECONOMICS**

*Upper Division Prerequisites.*—For students with a major in economics, courses 1A-1B and Mathematics 13 are prerequisite to all upper division work in the department unless otherwise specified. For students not majoring in economics, courses 1A-1B and junior standing are prerequisite to all upper division work in the department, except where Mathematics 13 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 pages 79-80.

*Departmental Major Adviser.*—Mr. Brekke.

*Preparation for the Major.*—Required: courses 1A-1B and Mathematics 13, and a minimum average grade of C in these courses. Recommended: Business Administration 1A-1B, and at least an introductory course in another social science (6 units in political science, history, or sociology and social institutions preferred). It is recommended that students who intend to make economics their major complete courses 1A-1B and Mathematics 13 by the end of their sophomore year.

*The Major.*—Required: 24 units of upper division economics, 3 units of which may be satisfied by Business Administration 131.

Except under extraordinary circumstances, no more than 9 units of economics and business administration combined may be taken in one semester.

Junior Year: courses 100A-100B (6); 110 (3); 135 (3). Course 135 should be taken before 100B.

Senior Year: completion of the major as determined by consultation with the departmental adviser.

The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses taken in the department and in courses in business administration taken in satisfaction of major requirements. Students who do not maintain such an average may be required at any time to withdraw from the major in economics.

## LOWER DIVISION COURSES

**1A. Principles of Economics. (3) I and II.**

Mr. Brekke

Introduction to economic theory and an analysis of the operation and problems of the modern economic system.

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

Mr. Brekke

Prerequisite: course 1A.

Organization and functioning of the economy; income creation and distribution, monetary and fiscal problems, cyclical fluctuations.

## UPPER DIVISION COURSES

- 100A-100B. **Economic Theory.** (3-3) Yr. Mr. Brekke  
It is recommended that this course be taken in the junior year.  
Study of the economic process with special reference to the theory of general equilibrium, particular equilibrium, imperfect competition, and economic fluctuations.
- \*110. **Economic History Since 1850.** (3) II. \_\_\_\_\_  
Prerequisite: consent of the instructor.  
Economic development since 1850 in the leading industrialized countries.
121. **Industrial Organization.** (3) I. \_\_\_\_\_  
The organization and structure of industries and their markets in the American economy, competitive behavior, price policy, and market performance in such industries; public policy in the regulation of industry.
- 130A. **Public Finance and Taxation.** (3) I. \_\_\_\_\_  
A general survey of the growth and economic effect of public expenditure and public indebtedness, the character of taxation, and tax problems (federal, state and local) of the United States.
133. **Dynamic Economics and Business Fluctuations.** (3) II. \_\_\_\_\_  
Prerequisite: courses 135 and 100A or Business Administration 100.  
It is recommended that this course be taken in the senior year.
135. **Money and Banking.** (3) I. Mr. Brekke  
Primarily for juniors.  
Monetary and banking institutions; monetary theory, international monetary relations, monetary policy.
150. **Labor Economics.** (3) II. \_\_\_\_\_  
The social background of labor legislation and trade unionism.  
Students will not receive credit for both this course 150 and Business Administration 150.
190. **International Economic Relations.** (3) I. \_\_\_\_\_  
Fundamental factors in international economic relations.
199. **Special Study for Advanced Undergraduates.** (1-3) I and II.  
The Staff (Mr. \_\_\_\_\_ in charge)

## SOCIOLOGY

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

## LOWER DIVISION COURSES

1. **Introduction to Sociology.** (3) I. \_\_\_\_\_  
Principal concepts and theories: culture, personality, status, social group, community, etc. Emphasis will be upon the systematic presentation of the basic concepts and fields of investigation in contemporary sociology.
2. **Social Organization.** (3) II. \_\_\_\_\_  
Comparative treatment of problems of social organization and change in Western and non-Western societies. Emphasis will be upon the social aspects of industrialization.

\* Not to be given, 1953-1954.



## EDUCATION

(Department Office, 8 Temporary Building No. 6)

Sidney S. Sutherland, M.S., *Assistant Professor of Education (Chairman of the Department)*.

Margaret R. Sutherland, Ph.D., *Instructor in Education*.



Charles W. Bursch II, A.B., *Lecturer in Education*.

Frederick L. Griffin, M.S., *Professor of Agricultural Education*.

Arline Johnson, M.S., *Lecturer in Education*.

Elwood M. Juergenson, M.S., *Lecturer in Education*.

Claribel Nye, M.A., *Lecturer in Education*.

*Letters and Science List*.—Education 110.

*Departmental Major Advisers*.—Mr. Juergenson, Mr. Sutherland.

*The Major*.—See page 50.

### UPPER DIVISION COURSES

#### 110. Introduction to Educational Psychology. (3) I and II.

Prerequisite: Psychology 1A.

Miss Sutherland

Original nature and tendencies of man; the learning process; individual differences and their measurement; the growth and development of children.

#### 115. Tests and Measurements. (3) I.

Mr. Bursch

Prerequisite: course 110.

A critical survey of teacher-made and standardized tests; principles and functions of measurement in education, current practices in school marks; supervised work in test administration, scoring, and interpretation.

#### 160. Vocational Education. (2) I and II.

I. Miss Johnson; II. Mr. Juergenson

Philosophy and organization of vocational education of less than college grade, with particular reference to educational principles for agriculture, commerce, homemaking, and industry.

#### †161. Problems in Vocational Education. (2) I and II.

Mr. Sutherland

Vocational surveys, junior employments, occupational analysis, trade tests, apprentice training, vocational education for adults, foremanship courses, corporation schools, current legislation, etc.

#### 164. Introduction to Student Personnel Work. (2) II.

Mr. Bursch

Prerequisite: Psychology 1A and senior or graduate standing.

Nature and scope of the student personnel program in schools and colleges; role of teacher, counselor, and administrator. Survey of basic tools and techniques.

#### 170. Secondary Education. (2) I and II.

Miss Sutherland

Function, scope, objectives, and curricula, including the fields of the high school and junior college in relation to individual and social needs.

† Open only to apprentice teachers and graduate students.

**187. Extension Education in Agriculture and Home Economics. (2) II.**

Lecture and laboratory or field trip.

Miss Nye

Prerequisite: junior or senior standing.

A study of the techniques of teaching agriculture and home economics as developed in the United States through the Agricultural Extension Service. Laboratory practice in extension methods such as program planning, demonstrations, discussions, use of bulletins, the press, visual aids. Field study of organization and programs.

**198. Directed Group Study of Agricultural Education. (2) I and II.**

The Staff (Mr. Sutherland in charge)

Group study of selected problems dealing with subject matter relating to the teaching of technical agriculture.

**199. Special Study for Advanced Undergraduates in Agricultural Education.**

(1-5) I and II.

The Staff (Mr. Sutherland in charge)

## GRADUATE COURSE

**260A-260B. Vocational Education Seminar. (2-2) Yr. Mr. Sutherland**

For graduate students whose major interest is in vocational education, vocational guidance, or closely related problems.

## SUPERVISED TEACHING COURSES

**†320A. Introduction to Teaching. (1) I and II.**

I. Mr. Juergenson; II. Miss Johnson

A limited number of juniors and seniors will be admitted.

Lectures, conferences, and field work. Observations and participation in some form of public school work.

**320B. Audio-Visual, Radio, and Other Instructional Resources. (2) I and II.**

Mr. Juergenson

Lectures, conferences, demonstrations, and school experience. Introduction to the materials and methods of audio-visual-radio education. Preparation of teaching materials; collecting, organizing, processing, and evaluating audio-visual materials.

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

Mr. Sutherland, Mr. Juergenson, Miss Johnson, Miss Sutherland

Prerequisite: course 320A.

Directed teaching for candidates for the special and general secondary credentials. Candidates who are graduates of institutions other than the University of California must submit two copies of transcripts of record at the time of applying for supervised training.

**†320E. Methods of Teaching. (2) I and II.**

Lectures, conferences, and laboratory.

All students enrolled in 320E must enroll in 320C concurrently.

Sec. 1. Agriculture.

Mr. Sutherland

The principles and methods of teaching agriculture in the secondary schools of California in accordance with the provisions of the Federal and State Vocational Education Acts.

Sec. 2. Homemaking.

Miss Johnson

Planning for teaching; basis for selection and organization of materials,

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† Open only to apprentice teachers and graduate students.

their use and evaluation; teaching methods and classroom aids. Practices in class and department management. Relation of department programs to school and community.

Sec. 3. General.

Miss Sutherland

Student teaching in subjects other than agriculture and homemaking. Selection, organization, presentation, and evaluation of materials. Practice in the provision of good learning situations in secondary schools.

†323. **Practicum in Supervised Teaching.** (2-4) I and II.

Mr. Sutherland, Miss Johnson, Mr. Juergenson, Miss Sutherland

Prerequisite: course 320C or experience as a teacher, and consent of the instructor.

An opportunity to obtain more extended and varied experience under supervision. One hundred hours of work, including preparation and attendance at the professional methods section under course 320C is the minimum requirement.

## ENGINEERING

For courses in agricultural engineering, engineering, or mechanical engineering, see "Agricultural Engineering" on page 109.

## ENGLISH, DRAMATIC ART, AND SPEECH

(Department Office, 2 and 3 Temporary Building No. 1)

Celeste T. Wright, Ph.D., *Professor of English (Chairman of the Department)*.

Solomon Fishman, Ph.D., *Associate Professor of English*.

Linda Van Norden, Ph.D., *Associate Professor of English*.

Elizabeth R. Homann, Ph.D., *Assistant Professor of English*.

Gwendolyn B. Needham, Ph.D., *Assistant Professor of English*.

Thomas A. Hanzo, Ph.D., *Instructor in English*.

Robert A. Wiggins, M.A., *Acting Instructor in English*.

———, *Instructor in Dramatic Art*.



Susan F. Regan, M. A., *Lecturer in English*.

### DRAMATIC ART

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

#### LOWER DIVISION COURSE

10A-10B. **Fundamentals of Acting.** (3-3) Yr. \_\_\_\_\_

Lectures and laboratory.

#### UPPER DIVISION COURSE

158A-158B. **History of the Drama.** (3-3) Yr. \_\_\_\_\_

Prerequisite: English 1A and junior standing.

† Open only to apprentice teachers and graduate students.

## ENGLISH

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79–80).

*Departmental Major Advisers.*—Mr. Fishman, Mrs. Homann, Mrs. Needham, Mrs. Wright.

*Preparation for the Major.*—First year, course 1A–1B required. Second year, courses 46A–46B, and 44A or 44B. Recommended: Philosophy.

*The Major.*—Twenty-four units of upper division work with specific requirements: Third Year, course 100; Fourth Year, English 151L.

The upper division program must also include courses 117J, 158B, and either 137A or 137B; and one of the following courses: 114A, 125C, 125D, 166, 177; Dramatic Art 158A, 158B. Recommended: a course in English history.

Course 106L and 110 and Speech 2A are required of candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is English; in addition, course 125C or 125D is advised.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who do not maintain such an average will be required to withdraw from the major in English.

Attention is called to the requirements in foreign languages for higher degrees in English at Berkeley—a reading knowledge of French or German for the M.A.; of French, German, and Latin for the Ph.D. Undergraduates contemplating advanced study in English should prepare to satisfy these requirements as they proceed to the bachelor's degree.

## LOWER DIVISION COURSES

Student must have passed Subject A before taking any course in English.

1A. **Reading, Composition, and Speech.** (3) I and II. The Staff  
Principles of effective reading, writing, and speaking.

1B. **Reading, Composition, and Speech.** (3) I and II. The Staff  
Prerequisite: course 1A.

Continuation of course 1A. For maximum benefit, the student is advised to complete both courses.

44A–44B. **Masterpieces of Literature.** (3–3) Yr.

I. Mr. Fishman; II. Miss Van Norden

Prerequisite: course 1A and sophomore standing. Course 44A is not prerequisite to 44B.

Lectures on great works of the world's literature.

46A–46B. **Survey of English Literature.** (3–3) Yr.

I. Mrs. Needham; II. Mr. Wiggins

Prerequisite: course 1A and sophomore standing. Course 46A is not prerequisite to 46B.

The more important aspects of the history of English literature from the beginnings to 1900.

## UPPER DIVISION COURSES

100. **Methods and Materials of Literary Criticism.** (3) I. Mr. Hanzo  
Prerequisite: course 1A–1B and junior standing.

Explication and evaluation of literary texts and study of the various principles of literary judgment.

- 106L. **Advanced Composition.** (3) I. Mrs. Wright  
Prerequisite: course 1A and junior standing.  
Designed to develop a clear, accurate, interesting style. Required of prospective high school English teachers.
110. **The English Language.** (3) I. Mrs. Homann  
Prerequisite: course 1A and junior standing.  
The history, nature, and use of the English language.
- \*114A. **The English Drama to 1642.** (3) I. Mrs. Homann  
Prerequisite: course 1A and junior standing.  
From the miracle plays to Elizabethan drama.
- 117J. **Shakespeare.** (3) I. Miss Van Norden  
Prerequisite: course 1A and junior standing.  
Study of twelve to fifteen of Shakespeare's principal plays.
- 125C. **The Novel.** (3) I. Mrs. Needham
- 125D. **The Novel.** (3) II. Mr. Fishman  
Prerequisite: course 1A and junior standing. Course 125C is not prerequisite to 125D.  
From Dickens to Hardy.
- 137A. **Survey of American Literature.** (3) II. Mr. Wiggins  
Prerequisite: course 1A and junior standing.  
From the beginning to the Civil War.
- \*137B. **Survey of American Literature.** (3) II. Mr. Wiggins  
Prerequisite: course 1A and junior standing.  
From the Civil War to the present.
- 151L. **Chaucer.** (3) II. Mrs. Homann  
Prerequisite: course 1A-1B and junior standing.
- 158B. **Literature of the Seventeenth Century.** (3) II. Miss Van Norden  
Prerequisite: course 1A and junior standing. Students who have taken course 157 are not eligible to take course 158B for credit.
- \*166. **The Age of Swift and Pope.** (3) I. Mrs. Needham  
Prerequisite: course 1A and junior standing.
177. **The Romantic Period.** (3) I. Mr. Fishman  
Prerequisite: course 1A and junior standing.  
Wordsworth, Coleridge, Byron, Shelley, Keats, and their eighteenth-century precursors.
199. **Special Study for Advanced Undergraduates.** (1-3) I and II.  
The Staff (Mrs. Wright in charge)  
Limited to seniors who have completed at least 9 units of upper division English and who have the consent of the instructor.

**SPEECH**

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

\* Not to be given, 1958-1954.

## LOWER DIVISION COURSES

Students must have passed Subject A before taking Speech 1B.

## 1B. Principles and Types of Speech. (3) II.

Prerequisite: course 1A as offered in previous years at Davis; or English 1A-1B, which provide training in speech.

## 2A. The Fundamentals of Oral Interpretation of Literature. (3) I. ———

Prerequisite: English 1A-1B.

Introduction to the oral reading of prose and poetry; practice in speaking and reading, with training in the principles of effective delivery.

## 25. Oral English for Foreign Students. (4) I and II. Mrs. Regan

For foreign students only. Pronunciation, speaking, grammar, reading, and writing of English. Required of those who do not 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. Regan

Continuation of course 25; required of those who have taken course 25.

## SUBJECT A

## Subject A. English Composition. (No credit) I and II. The Staff

Required of all students who do not pass the examination in Subject A. Fee, \$20. Students who maintain an average grade of A during the first seven weeks of the semester will receive a refund of \$5 and will be excused from further attendance in the course.

## ENTOMOLOGY AND PARASITOLOGY

(Department Office, 2 Entomology Building)

Stanley F. Bailey, Ph.D., *Professor of Entomology (Vice-Chairman of the Department)*.

John E. Eckert, Ph.D., *Professor of Entomology*.

Stanley B. Freeborn, Ph.D., *Professor of Entomology*.

Leslie M. Smith, Ph.D., *Professor of Entomology*.

Richard M. Bohart, Ph.D., *Associate Professor of Entomology*.

William H. Lange, Jr., Ph.D., *Associate Professor of Entomology*.

E. Gorton Linsley, Ph.D., *Associate Professor of Entomology (Chairman of the Department) Berkeley campus*.

Eugene M. Stafford, Ph.D., *Associate Professor of Entomology*.

Harry H. Laidlaw, Jr., Ph.D., *Assistant Professor of Entomology*.

Francis M. Summers, Ph.D., *Assistant Professor of Entomology*.



James R. Douglas, Ph.D., *Associate Professor of Parasitology*.

John W. MacSwain, Ph.D., *Assistant Professor of Entomology*.

## ENTOMOLOGY

*Letters and Science List*.—Entomology 100, 106, 112, 127.

*Departmental Major Adviser*.—Mr. Bohart.

*The Major*.—See page 54.

## LOWER DIVISION COURSE

## 49. Summer Field Course. (No credit) Mr. Bohart, Mr. MacSwain

Six weeks, daily, except Sunday.

Prerequisite: one course in entomology or approval of instructor.

The study and collection of insects in their natural habitats, with special emphasis on ecology, life histories, and field recognition.

## UPPER DIVISION COURSES

100. **General Entomology.** (4) II. Mr. Bohart, Mr. Freeborn  
Lectures and laboratory.  
An introduction to the classification, life histories, morphology, physiology, and ecology of insects.
105. **Apiculture.** (4) II. Mr. Eckert  
Lectures and laboratory.  
Biology and fundamentals of beekeeping.
106. **Introduction to Structure and Function in Insects.** (5) I. Mr. Laidlaw, Mr. Summers  
Lectures and laboratory.  
Prerequisite: course 100 or equivalent.  
Comparative anatomy and physiology of selected insect types; histological techniques; general principles of insect physiology.
107. **Queen Bee Rearing.** (4) II. Mr. Laidlaw  
Lectures and laboratory.  
Prerequisite: course 105 or advanced training in apiculture, and consent of instructor.  
History, critical role played by queen bees in beekeeping practice; morphology of reproductive system; formation of germ cells; embryology and postembryological development; practice in modern queen-rearing methods; selection and testing of stock; artificial insemination of queen bees.
112. **Systematic Entomology.** (4) I. Mr. Bohart  
Lectures and laboratory.  
Prerequisite: course 100.  
The classification of insects, taxonomic categories and procedures; bibliographical methods; nomenclature; museum practices.
124. **Economic Entomology.** (4) I. Mr. Smith, Mr. Lange  
Lectures and laboratory.  
Life histories, habits, and control of insects attacking fruit trees and field and vegetable crops of California.
127. **Insect Ecology.** (3) II. Mr. Bailey  
Prerequisite: upper division standing in one of the biological sciences.  
Principles of ecology with examples from the insects; insect behavior; analysis of the insect environment; population dynamics.
128. **Chemistry of Insecticides and Fungicides.** (4) II. Mr. Stafford  
Lectures and laboratory.  
Prerequisite: Chemistry 8, or consent of the instructor.  
Chemical composition and reactions of insecticides and fungicides, and their physiological effects on plant and animal tissues.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Bailey in charge)

## GRADUATE COURSES

- 200A-200B. **Research in Entomology and Parasitology.** (1-6; 1-6) Yr.  
The Staff
- 201A-201B. **Seminar in General Entomology.** (1-1) Yr.  
The Staff (Mr. Bailey in charge)

## FOOD TECHNOLOGY

(Department Office, 126 Food Technology Building)

Gordon Mackinney, Ph.D., *Professor of Food Technology (Berkeley Campus)*.

Emil M. Mrak, Ph.D., *Professor of Food Technology (Chairman of the Department)*.

George L. Marsh, M.S., *Associate Professor of Food Technology*.

Herman J. Phaff, Ph.D., *Associate Professor of Food Technology*.

Reese H. Vaughn, Ph.D., *Associate Professor of Food Technology*.

Clarence Sterling, Ph.D., *Assistant Professor of Food Technology*.

Elly H. Hinreiner, Ph.D., *Instructor in Food Technology*.

Aloys L. Tappel, Ph.D., *Instructor in Food Technology*.



Samuel Lepkovsky, Ph.D., *Professor of Poultry Husbandry (Berkeley Campus)*.

George F. Stewart, Ph.D., *Professor of Poultry Husbandry*.

*Letters and Science List.*—Food Technology 116.

*Departmental Major Advisers.*—Mr. Marsh, Mr. Mrak.

*The Major.*—See page 56.

### UPPER DIVISION COURSES

112. **Principles and Practices of Food Processing.** (3) I. Mr. Marsh  
 Prerequisite: Chemistry 1A, 1B; Bacteriology 1.  
 Principles and technological processes involved in the preparation, preservation, and examination of fruit and vegetable products.
113. **Chemical and Biochemical Aspects of Food Processing.** (3) II. Mr. Sterling, Mr. Tappel  
 Prerequisite: Chemistry 1A, 1B, 8; Bacteriology 1.  
 Relation of food processing and handling to acceptability, color changes, enzyme activity, deterioration, flavor, vitamin retention, and other factors.
114. **Principles of Food Processing Operations.** (4) I. Mr. Marsh  
 Lectures and laboratory.  
 Prerequisite: Chemistry 1A, 1B, 5, 8; Bacteriology 1.  
 Technical principles relating to processing operations used in the commercial preservation of fruits, vegetables, and other foods; theory and practical applications, including field trips.
115. **Food Analysis.** (4) II. Miss Hinreiner  
 Lectures and laboratory.  
 Prerequisite: Chemistry 1A, 1B, 5, 8; Bacteriology 1 recommended.  
 Application of quantitative physical and chemical methods of analysis to examination of commercial fruit and vegetable products; laboratory control and research, methods of analysis as applied to food processing; interpretation of results in relation to manufacturing methods and commercial standards.
116. **Yeasts and Related Organisms.** (4) II. Mr. Mrak, Mr. Phaff  
 Lectures and laboratory.  
 Prerequisite: Chemistry 1A-1B, 8; Botany 1 or 12; Bacteriology 1.  
 Morphology, development, classification, and distribution of yeasts; relation to other fungi, growth requirements; physiological activities, including certain industrial aspects.



117. **Food Microbiology.** (4) I. Mr. Vaughn  
Lectures and laboratory.  
Prerequisite: course 114. Recommended: Bacteriology 105 and course 116.  
Characteristics, activity, and control of beneficial and spoilage organisms in the canning, dehydration, fermentation, freezing, pickling, preserving, and other food industries.
119. **Microscopy of Food Materials.** (3) II. Mr. Sterling  
Lecture and laboratory.  
Prerequisite: organic chemistry; plant anatomy or Botany 1 and consent of instructor.  
Histology of foods; histochemical methods; effects of processing on microscopic structure of food materials.
- \*120. **The Natural Coloring Matters.** (3) I. Mr. Mackinney  
Lectures and laboratory.  
Prerequisite: 3 units of biochemistry or plant biochemistry, or upper division organic chemistry.  
Chemistry of natural pigments and related compounds; spectrophotometric and chromatographic techniques; special emphasis on pigments in relation to foods.
127. **Recent Advances in Food Technology.** (1) I and II.  
May be repeated once for credit. Mr. Phaff, Mr. Tappel  
Prerequisite: two courses in food technology or the equivalent.  
Assigned topics, reports, and discussions concerning recent advances in food technology.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II. Mr. Mrak

## GRADUATE COURSES

- 200A-200B. **Seminar in Food Technology.** (1-1) Yr. Mr. Sterling, Mr. Tappel
- 237A-237B. **Research in Food Technology.** (1-9; 1-9) Yr. The Staff

**FOREIGN LANGUAGES**

(Department Office, 3 Temporary Building No. 4)

- Iver N. Nelson, Ph.D., *Associate Professor of Spanish (Chairman of the Department)*.
- Merle L. Perkins, Ph.D., *Assistant Professor of French.*
- Siegfried B. Puknat, Ph.D., *Assistant Professor of German.*
- Daniel S. Keller, Ph.D., *Instructor in Spanish.*
- , *Instructor in German.*



Max Bach, M.A., *Lecturer in French.*

\* Not to be given, 1953-1954.

## CLASSICS

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see page 79-80).

Courses in this group, which are designated Classics 34 and Classics 35, do not require a knowledge of the Greek or the Latin language.

## LOWER DIVISION COURSES

\*34. **Epic Poetry: Homer and Virgil.** (2) I.

A study of the *Iliad*, *Odyssey*, and *Aeneid* with reference to content, structure, significance, and influence.

\*35. **Greek Drama.** (2) II.

Lectures on twelve Greek tragedies.

## FRENCH

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses. For regulations governing this list, see page 79.

*Departmental Major Advisers.*—

*Preparation for the Major.*—Required: courses 1, 2, 3, 4, 25, or their equivalents. (Students who receive grade A or B in French 4 will be admitted to the upper division courses without the requirement of course 25.) History 4A-4B, Philosophy 20A-20B, English 1A-1B, and Latin are strongly recommended.

*The Major.*—Required: courses 101A-101B, 109A-109B, and either 112A-112B, or 120A-120B.

Any of the remaining upper division courses may be counted for the major; however, with the permission of the department, 4 units of the 24 may be satisfied by appropriate upper division courses in the following departments: Classics, English, German, History, Philosophy, or Spanish. Students who fail to maintain an average of C or better in upper division courses in French will be excluded from the major.

## LOWER DIVISION COURSES

1. **Elementary French—Beginning.** (4) I. Mr. Perkins  
This course corresponds to the first two years of high school French.
2. **Elementary French—Continued.** (4) I and II. \_\_\_\_\_  
Prerequisite: course 1 or two years of high school French.
3. **Intermediate French.** (4) I and II. Mr. Bach  
Prerequisite: course 2 or three years of high school French.
4. **Intermediate French. Composition and Conversation.** (4) II. Mr. Bach  
Prerequisite: course 3 or four years of high school French.
25. **Advanced French.** (3) I. Mr. Perkins  
Prerequisite: course 4.

## UPPER DIVISION COURSES

The prerequisite to all upper division courses is 16 units of lower division courses, including course 4 with grade A or B, or course 25.

Courses 101A-101B and 109A-109B must usually be taken before any other upper division course.

\* Not to be given, 1953-1954.

- 101A-101B. **Intensive Reading, Grammar, and Composition.** (3-3) Yr. \_\_\_\_\_  
 Mr. Bach
- 109A-109B. **A Survey of French Literature from the Middle Ages to the Present.** (3-3) Yr. \_\_\_\_\_  
 Mr. Perkins
- \*112A-112B. **The Nineteenth Century.** (2-2) Yr. \_\_\_\_\_  
 Given in alternate years.
- 120A-120B. **The Seventeenth Century.** (2-2) Yr. \_\_\_\_\_  
 Given in alternate years.
- \*121A-121B. **The Eighteenth Century.** (2-2) Yr. \_\_\_\_\_  
 Given in alternate years.

## GERMAN

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science list of courses. For regulations governing this list, see page 79.

*Departmental Major Adviser.*—Mr. Puknat.

*Preparation for the Major.*—German 1, 2, 3, 4, or their equivalents, completed satisfactorily.

*The Major.*—Required: 24 units in upper division courses, including one full year's course in composition. Six of the 24 units may be related work in other departments. Students who fail to maintain an average of C or better in upper division courses in German will be excluded from the major.

## LOWER DIVISION COURSES

1. **Elementary German—Beginning.** (4) I and II. \_\_\_\_\_  
 This course corresponds to the first two years of high school German.
2. **Elementary German—Continued.** (4) I and II. \_\_\_\_\_  
 Prerequisite: course 1 or two years of high school German.
3. **Intermediate German.** (4) I. \_\_\_\_\_ Mr. Puknat  
 Prerequisite: course 2 or three years of high school German.
4. **Intermediate German.** (4) II. \_\_\_\_\_ Mr. Puknat  
 Prerequisite: course 3 or four years of high school German.
- 1G. **German for Graduate Students.** (No credit) I. \_\_\_\_\_  
 A course designed to prepare students for the graduate reading examination.

## UPPER DIVISION COURSES

Prerequisite: satisfactory completion of course 4, or its equivalent.

- \*100. **Introduction to Modern German Literature.** (3) II. \_\_\_\_\_  
 Lectures on, and readings from, the main figures of German literature in the past half century: the crisis of modern man as reflected in Rilke, Kafka, Hesse, Thomas Mann, and others.
- 103A-103B. **The Classical Period.** (3-3) Yr. \_\_\_\_\_ Mr. Puknat  
 103A. Lessing and Schiller.  
 103B. Goethe.
- \*104. **The Nineteenth-Century Drama.** (3) II. \_\_\_\_\_  
 The development of the German drama after the Classic Age and to the end of the nineteenth century. Reading of representative plays by Kleist, Grillparzer, Büchner, Hebbel, Wagner, and Hauptmann.

\* Not to be given, 1953-1954.

**\*114. Nineteenth-Century Prose. (3) I.**

Readings from representative German prose writers of the nineteenth century.

**\*118A-118B. History of German Literature. (3-3) Yr.**

118A. The Middle Ages to 1624.

118B. From 1624 to 1885.

**130A-130B. Advanced Grammar, Composition, and Conversation. (3-3) Yr.****GREEK**

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

**LOWER DIVISION COURSE****\*1A-1B. Greek for Beginners. (3-3) Yr.****LATIN**

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses. For regulations governing this list, see page 79.

**LOWER DIVISION COURSES****\*1. Elementary Latin—Beginning. (4) I.****\*2. Elementary Latin (continuation of 1). (4) II.**

Prerequisite: two years of high school Latin or course 1 or consent of the instructor.

**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 79.

*Departmental Major Adviser.*—Mr. Nelson.

*Preparation for the Major.*—Four years of high school Spanish, or courses 1, 2, and 3, and also 4 unless course 3 has been passed with a grade of A or B; course 25A-25B with a grade of A or B; two years of high school Latin, or Latin 1 (to be completed before entering upon the senior year).

*The Major.*—Required: 24 units of upper division work in the department, including course 107A-107B (6 units). The remaining units may be completed from courses 103A-103B, 109A-109B, 110A-110B, 111A-111B, and 112A-112B.

Students who fail to maintain an average grade of at least C in the Spanish courses taken in the upper division will be excluded from the major.

**LOWER DIVISION COURSES**

Students whose native tongue is Spanish will not normally be admitted to any lower division courses except Spanish 25A-25B.

**1. Elementary Spanish—Beginning. (4) I.**

Mr. Keller

This course corresponds to the first two years of high school Spanish.

**2. Elementary Spanish—Continued. (4) I and II.**

Mr. Nelson

Prerequisite: course 1 or two years of high school Spanish.

**3. Intermediate Spanish. (4) I and II.**

Mr. Keller

Prerequisite: course 2 or three years of high school Spanish, or the equivalent.

\* Not to be given, 1953-1954.

4. **Intermediate Spanish (continuation of 3).** (4) II. Mr. Keller  
Prerequisite: course 3 or four years of high school Spanish, or the equivalent.
- 25A-25B. **Advanced Spanish.** (3-3) Yr. Mr. Nelson  
Required as preparation for the major.  
Prerequisite: four years of high school Spanish, or course 3 (with a grade of at least B) or course 4, or the equivalent.

## UPPER DIVISION COURSES

(The prerequisite to all upper division courses is 16 units of lower division Spanish or the equivalent.)

- 103A. **History of Spanish Literature (1680-1900).** (3) I. Mr. Keller
- 103B. **Study of a Prose Genre of the Nineteenth Century.** (3) II. Mr. Keller
- \*107A-107B. **History of Spanish Literature to 1680.** (3-3) Yr. Mr. Nelson
- \*109A-109B. **The Spanish Drama of the Sixteenth and Seventeenth Centuries.** (2-2) Yr. Mr. Nelson  
Given in alternate years.
- 110A-110B. **Twentieth-Century Peninsular Prose.** (2-2) Yr. Mr. Keller  
Given in alternate years.
- 111A-111B. **Cervantes.** (2-2) Yr. Mr. Nelson  
Given in alternate years.
- \*112A-112B. **A Survey of Spanish Culture.** (2-2) Yr. \_\_\_\_\_  
Given in alternate years.
199. **Special Study for Advanced Undergraduates.** (1-3) I and II.  
The Staff (Mr. Nelson in charge)

**FRENCH**

For courses in French see "Foreign Languages" on page 141.

**GENETICS**

(Department Office, 222 Animal Science Building)

- Roy E. Clausen, Ph.D., *Professor of Genetics (Chairman of the Department Berkeley campus).*
- G. Ledyard Stebbins, Jr., Ph.D., *Professor of Genetics (Vice-Chairman of the Department).*
- Melvin M. Green, Ph.D., *Assistant Professor of Genetics.*



Members of the Genetics Group:

- Robert W. Allard, Ph.D., *Associate Professor of Agronomy.*
- Vigfus S. Asmundson, Ph.D., *Professor of Poultry Husbandry.*

\* Not to be given, 1953-1954.

- Fred N. Briggs, Ph.D., *Professor of Agronomy.*  
 Daniel W. Cassard, Ph.D., *Instructor in Animal Husbandry.*  
 Glen N. Davis, Ph.D., *Associate Professor of Vegetable Crops.*  
 Paul W. Gregory, Sc.D., *Professor of Animal Husbandry.*  
 Claron O. Hesse, Ph.D., *Assistant Professor of Pomology.*  
 Paulden F. Knowles, Ph.D., *Assistant Professor of Agronomy.*  
 Robert C. Laben, Ph.D., *Assistant Professor of Animal Husbandry.*  
 Harry H. Laidlaw, Jr., Ph.D., *Assistant Professor of Entomology.*  
 Lloyd A. Linder, Ph.D., *Instructor in Viticulture.*  
 R. Merton Love, Ph.D., *Professor of Agronomy.*  
 Harold P. Olmo, Ph.D., *Professor of Viticulture.*  
 Charles M. Rick, Jr., Ph.D., *Associate Professor of Vegetable Crops.*  
 Wade C. Rollins, Ph.D., *Assistant Professor of Animal Husbandry.*  
 Charles W. Schaller, Ph.D., *Assistant Professor of Agronomy.*  
 Dale G. Smeltzer, Ph.D., *Assistant Professor of Agronomy.*  
 Francis L. Smith, Ph.D., *Associate Professor of Agronomy.*  
 Paul G. Smith, Ph.D., *Associate Professor of Vegetable Crops.*  
 Ernest H. Stanford, Ph.D., *Associate Professor of Agronomy.*  
 Clyde N. Stormont, Ph.D., *Assistant Professor of Veterinary Science.*

*Letters and Science List.*—Genetics 100, 100C, 103, 106.

*Departmental Major Adviser.*—Mr. Stebbins.

*The Major.*—See Animal Science Curriculum, page 52, and Plant Science Curriculum, page 59.

#### UPPER DIVISION COURSES

100. **Principles of Genetics.** (3) I and II. I. Mr. Green; II. Mr. Stebbins  
 Prerequisite: General Botany or General Zoölogy.  
 Introduction to genetics with some consideration of its applications in agriculture and biology.  
 Students taking Genetics 100C concurrently will include their conference hour within the laboratory period of that course.
- 100C. **Principles of Genetics Laboratory.** (1) I and II.  
 Laboratory. I. Mr. Green; II. Mr. Stebbins  
 Prerequisite: must be taken concurrently with course 100.  
 Laboratory work in elementary genetics to supplement course 100.
- \*103. **Organic Evolution.** (3) I. Mr. Stebbins  
 Prerequisite: course 100.  
 The principles of evolution, with particular reference to the evolutionary processes in plants.
106. **Advanced Genetics.** (3) II. Mr. Green  
 Prerequisite: course 100, Botany 130, Chemistry 8.  
 An introduction into the nature and properties of the gene; gene mutation, the mechanism of gene action and related topics.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
 The Staff (Mr. Stebbins in charge)

\* Not to be given, 1953-1954.

## RELATED COURSES

- Plant Breeding (Agronomy 114).  
 Quantitative Inheritance in Plant Breeding (Agronomy 130).  
 Population Genetics (Animal Husbandry 125).  
 Fruit Breeding (Pomology 114).  
 Vegetable Breeding (Vegetable Crops 120)

## GRADUATE COURSES

- 200A-200B. Research in Genetics. (1-6; 1-6) Yr. The Staff  
 201A-201B. Staff Seminar in Genetics. (No credit) Yr.  
 Prerequisite: course 100. The Genetics Group (Mr. Green in charge)  
 Weekly meetings for presentation of topics by members of the staff,  
 visiting investigators and graduate students.  
 202A-202B. Graduate Seminar in Genetics (1-4; 1-4) Yr.  
 The Genetics Group (Mr. Green in charge)  
 Prerequisite: graduate standing in Genetics.  
 Intensive study of special topics, under supervision of some member  
 of the staff.

**GEOLOGICAL SCIENCES**

(Department Office, 241 Soils and Irrigation Building)

Charles G. Higgins, Ph.D., *Assistant Professor of Geology (Chairman of the Department)*.

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

**GEOLOGY**

## LOWER DIVISION COURSES

1. **General Geology—Dynamical and Structural.** (3) I. Mr. Higgins  
 Lectures and laboratory.  
 Prerequisite: high school chemistry or Chemistry 1A.  
 Minerals and rocks; weathering and erosion of rocks; study of sub-  
 surface water, volcanoes, earthquakes, and mountain-building movements.  
 3. **General Geology—Historical.** (3) II. Mr. Higgins  
 Lectures and demonstration-discussion.  
 Prerequisite: course 1.  
 Origin and geological history of the earth and the evolution of its plant  
 and animal inhabitants.

## UPPER DIVISION COURSE

103. **Introduction to Petrology.** (4) II. Mr. Higgins  
 Lectures and laboratory.  
 Prerequisite: course 1 and Mineralogy 6.  
 Origin, occurrence, characteristics, and classification of rocks. Labora-  
 tory practice in determination of textures, mineral components, and identifi-  
 cation of rocks by study of hand specimens.

**MINERALOGY**

## LOWER DIVISION COURSE

**6. Introduction to Mineralogy. (4) I.**

Mr. Higgins

Lectures and laboratory.

Prerequisite: Geology 1 or consent of instructor.

Origin, occurrence and associations, properties, and identification of minerals; study of mineral crystals and crystal models.

**GERMAN**

For courses in German see "Foreign Languages" on page 142.

**GREEK**

For courses in Greek see "Foreign Languages" on page 143.

**HISTORY AND POLITICAL SCIENCE**

(Department Office, 13 Temporary Building No. 1)

Vernon J. Puryear, Ph.D., *Professor of History.*W. Turrentine Jackson, Ph.D., *Assistant Professor of History.*Carl B. O'Brien, Ph.D., *Assistant Professor of History (Chairman of the Department).*James H. Shideler, Ph.D., *Assistant Professor of History.*Clyde E. Jacobs, Ph.D., *Instructor in Political Science.*W. Sheridan Warrick, M.A., *Acting Instructor in History.***HISTORY***Letters and Science List.*—All undergraduate courses in history are included in the Letters and Science List of Courses (see pages 79–80).*Departmental Advisers.*—Mr. O'Brien and Mr. Shideler.*Introductory Courses.*—Course 4A–4B is open to all students; course 17A–17B is open to all students above the freshman year.*The American History and Institutions Requirement* may be satisfied by any two of the following courses: course 17A, 17B, 174A, 174B, 176A, 176B, 178, 179, 187.*Preparation for the Major.*—Courses 4A–4B, 17A–17B, Political Science 1, 2, and Economics 1A.*The Major.*—Students majoring in history must complete 24 upper division units in history, including:

- (a) *In the junior year:* course 101 and at least two semester courses of broad scope preparatory to more specialized work in the same fields (courses 151A, 151B, 161A, 161B, 176A, 176B, 179).
- (b) *In the junior or senior year:* two additional semester courses in different fields from that chosen under (a) above. (These may be from courses 136A, 136B, 146, 178, 187.)
- (c) *In the senior year:* some concentration in one of the fields already studied, to be determined in consultation with the adviser. (This may be from courses 174A, 174B, 188A, 188B, 189A, 189B.)

The department will certify to the completion of a major program for graduation only on the basis of at least a grade C average in the upper division courses taken in the department. Students who cannot maintain such an average shall be required to withdraw from the major in history.



## LOWER DIVISION COURSES

- 4A-4B. **History of Western Europe.** (3-3) Yr. Mr. O'Brien  
 Prerequisite: course 4A is not prerequisite to 4B.  
 The growth of Western European civilization in its world setting from ancient times to the present.
- 17A-17B. **History of the United States.** (3-3) I and II. Mr. Jackson, Mr. Shideler  
 Prerequisite: course 17A is not prerequisite to 17B. Open to all students above the freshman year.  
 17A. American national beginnings from colonial times through 1865.  
 17B. The American nation from the Civil War to the present.

## UPPER DIVISION COURSES

101. **Introduction to Historical Method and Historiography.** (3) II. Mr. Jackson  
 Prerequisite: junior standing.  
 Prescribed in the junior year for, and restricted to, students majoring in history.
- 136A-136B. **History of Russia and Poland since the Crimean War.** (3-3) Yr. Mr. O'Brien  
 Prerequisite: course 136A is not prerequisite to 136B.  
 136A. Russia and Poland with emphasis on Soviet Russia.  
 136B. Russia and the Soviet Union in world politics and world economics.
- \*146. **Europe Since 1870.** (3) II. Mr. O'Brien  
 The political, social, and economic development of Europe from the Franco-Prussian War to the present.
- 151A-151B. **History of England from 1485 to the Present.** (3-3) Yr. Mr. O'Brien  
 Prerequisite: course 151A is not prerequisite to 151B.  
 151A. Tudor and Stuart England and the Empire, 1485-1714.  
 151B. History of Great Britain since 1714.
- 161A-161B. **Hispanic-American History.** (3-3) Yr. Mr. Warrick  
 Prerequisite: course 161A is not prerequisite to 161B.  
 161A. Colonial History of Latin America.  
 161B. The National Period of Latin American History.
- 174A-174B. **Recent History of the United States.** (3-3) Yr. Mr. Shideler  
 Prerequisite: course 174A is not prerequisite to 174B.  
 A general survey of political, economic, and cultural aspects of American democracy in recent years.  
 174A. 1896-1919.  
 174B. 1920 to the present.
- \*176A-176B. **Social and Cultural History of the United States.** (3-3) Yr. Mr. Shideler  
 Prerequisite: course 176A is not prerequisite to 176B.  
 176A. To 1865.  
 176B. 1865 to the present.
178. **Great Issues in United States History: Ideas and Interpretations.** (3) I. Mr. Jackson  
 Selected topics in the political, economic, social, and intellectual history of the United States. A study of historical thought and interpretation concerning the main currents of national development.

\* Not to be given, 1953-1954.

187. **The American Frontier.** (3) I. Mr. Warrick  
The political, economic, and social significance of the westward movement from colonial times to 1850.
- 188A-188B. **History of Agriculture in the United States.** (2-2) Yr.  
Prerequisite: course 188A is not prerequisite to 188B. Mr. Shideler  
A general survey of agricultural development from precolonial times to the present in the United States.
- 189A-189B. **History of California and the West.** (3-3) Yr. Mr. Jackson  
Prerequisite: course 189A is not prerequisite to 189B.  
189A. History of the Trans-Mississippi West and early California.  
189B. History of California since 1840.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff

## GRADUATE COURSES

- 271A-271B. **Seminar in the History of the American West.** (2-2) Yr.  
Mr. Jackson
- 288A-288B. **Seminar in the Agricultural History of the United States.** (2-2) Yr.  
Mr. Shideler
298. **Directed Research.** (2-4) I and II. The Staff

## POLITICAL SCIENCE

*Letters and Science List.*—All undergraduate courses in Political Science are included in the Letters and Science List of Courses (see pages 79-80).

*Departmental Major Adviser.*—Mr. Jacobs.

*The American History and Institutions Requirement* may be satisfied by any two of the following courses: courses 1, 113, 128, 157A, 157B.

*Preparation for the Major.*—Required: courses 1, 2, Economics 1A-1B, and either History 4A-4B or History 17A-17B, and a minimum average grade of C in these courses.

*The Major.*—Required: (1) 24 units of upper division work as follows:

- (a) 18 units in Political Science. This must include at least one course from each of four of the five groups offered: American Government, Political Theory, International Relations, Comparative Government, Public Law.
- (b) 6 units in related social sciences to be chosen from Economics 100A, 100B, 130A, 150, 190, and History 136A, 136B, 151A, 151B, 174A, 174B, 187.
- (2) Political Science students must maintain at least a grade C average in the major.

## LOWER DIVISION COURSES

1. **National Government of the United States.** (3) I. Mr. Jacobs  
An introduction to the principles and problems of government, with particular emphasis on national government in the United States.

2. **European Governments.** (3) II. Mr. Jacobs  
A study of constitutional principles, governmental institutions, and political problems of selected foreign governments.

## UPPER DIVISION COURSES

- \*102A. **State Government and Administration.** (3) I. Mr. Jacobs  
Structure, organization, and problems of state governments.
113. **American Political Theory.** (3) II. Mr. Jacobs  
Underlying theories and principles of United States government and policies.
120. **Colonies in World Politics.** (3) II. Mr. Puryear  
A survey of the more important historical imperial systems, followed by a study of colonial governments and the problems of imperialism in the world today.
123. **International Politics.** (3) I. Mr. Puryear  
Rise and development of the Western State system; problems of nationalism and imperialism, particularly in connection with the peace settlement following World War II.
124. **International Organization.** (3) II. Mr. Puryear  
The preservation of world peace through collective security arrangements. Analysis of the conditions under which international organizations can or cannot preserve peace through examination of the record of the United Nations, League of Nations, and more restricted security organizations.
128. **Recent American Foreign Policy.** (3) I. Mr. Puryear  
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.
140. **Advanced Principles of Comparative Government.** (3) I. Mr. Jacobs  
Prerequisite: course 2 is recommended.  
A functional analysis of the structure, powers, and activities of selected foreign governments. Political parties and electoral problems in these countries will receive attention.
- 157A-157B. **Development of the Constitution of the United States.** (3-3) Yr. Mr. Jacobs  
Prerequisite: one course in Political Science, preferably in the field of American government, or History 17A-17B. Course 157A is not prerequisite to 157B.  
Analysis of judicial cases and related materials illustrating the evolution of the Constitution of the United States.  
157A. Federalism, separation of powers, and national power.  
157B. Constitutional rights (personal and property).
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Puryear in charge)

## GRADUATE COURSE

- 230A-230B. **Seminar in American Foreign Policy.** (2-2) Yr. Mr. Puryear

\* Not to be given, 1953-1954.

## HOME ECONOMICS

(Department Office, 148 Home Economics Building)

Agnes F. Morgan, Ph.D., *Professor of Home Economics (Chairman of the Department) Berkeley campus.*

Virginia B. G. Kay, M.A., *Acting Instructor in Home Economics.*

Helen J. Souders, M.S., *Acting Instructor in Home Economics.*



R. Lorene Dryden, M.A., *Lecturer in Home Economics.*

Doris F. Heineman, B.A.E., *Lecturer in Home Economics.*

*Letters and Science List.*—Decorative Art. All undergraduate courses.

*Departmental Major Advisers.*—Miss Dryden, Mrs. Heineman, Mrs. Kay, Miss Souders.

*The Major.*—See page 57.

### DECORATIVE ART

#### LOWER DIVISION COURSES

6A. **Theory of Design and Color.** (2) I and II. Mrs. Heineman, Mrs. Kay  
Laboratory.  
Principles of design and color; original problems in the general field of design.

6B. **Theory of Design and Color.** (2) I and II. Mrs. Heineman, Mrs. Kay  
Laboratory.  
Prerequisite: course 6A.  
Principles of design and color as applied to textiles through the mediums of block print, stencil, and silk screen process.

7A. **Theory of Design and Color.** (2) I. Mrs. Kay  
Laboratory.  
Prerequisite: courses 6A, 6B.  
Second-year problems in the theory of design and color.

7B. **Theory of Design and Color.** (2) II. Mrs. Kay  
Laboratory.  
Prerequisite: courses 6A, 6B.  
Second-year problems in the theory of design and color.

#### UPPER DIVISION COURSE

130A. **Interior Design.** (2) I. Mrs. Heineman  
Study of design, selection, and arrangement of furnishings. Lectures, demonstrations, field trips.

### HOME ECONOMICS

#### LOWER DIVISION COURSES

1A-1B. **Experimental Food Study.** (3-3) Yr. Miss Souders  
Lecture and laboratory.  
Prerequisite: Chemistry 1A, 8 (may be taken concurrently). Recommended: Bacteriology 2.  
Production and composition of food and principles involved in food preservation and meal preparation.

- 6. Introduction to Textiles.** (3) II. Miss Dryden  
Lectures and laboratory.  
Prerequisite: Chemistry 1A, 8.  
Study of plant, animal, and synthetic fibers used in textiles and of the finished textile fabrics.  
Field trips are included.
- 7. Elementary Clothing Study.** (3) I. Miss Dryden  
Lecture and laboratory.  
Prerequisite: Decorative Art 6A, 6B.  
Practical and cultural problems in garment design and selection, with application in construction problems in clothing.
- 10. Elementary Nutrition.** (2) I. \_\_\_\_\_  
A nontechnical presentation of the scientific and practical bases and uses of the modern knowledge of nutrition.
- 12. Euthenics.** (2) I. \_\_\_\_\_  
A study of the function of the family and the homemaker in modern society, and of the contributions of the basic sciences and the arts to the solution of present-day social and economic problems of the individual and the family.
- 14. Consumer Problems.** (2) I. \_\_\_\_\_  
A nontechnical discussion of consumers' problems, including management of personal finances and efficient purchasing of consumers' goods.

## UPPER DIVISION COURSES

- 100. Food Economics.** (3) II. \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite or concurrent: courses 1A, 1B, 141.  
Field observation of manufacturing and distribution practices related to problems of consumers including those buying foods in large quantities.  
Laboratory study of qualities of food in relation to use and price.
- 112A-112B. Nutrition and Dietetics.** (3-3) Yr. Miss Souders  
Lectures and laboratory.  
Prerequisite: Chemistry 1A, 8; Physiology 1; 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.  
Field trips are included.
- 113A-113B. Nutrition and Dietetics.** (2-2) Yr. Miss Souders  
Prerequisite: Chemistry 1A, 8; Physiology 1 or biochemistry (Animal Husbandry 101).  
The food requirements of the normal individual and the special needs imposed by growth, pregnancy, lactation, and disease. The planning and computation of diets.
- 121. Institution Food Study.** (4) I. \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite: course 1A-1B.  
The principles and problems involved in the preparation and service of food in institutions.

122. **Institution Organization and Management.** (4) II. \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite: course 121 or permission of instructor.  
The principles and problems involved in the organization and management of institution households, such as residence halls, hospitals, hotels.
132. **Child Psychology.** (3) I. \_\_\_\_\_  
Prerequisite: Psychology 1A and preparation in statistics. Not open to students who have taken Psychology 112.  
A study of the factors concerned in the motor, sensory, language, mental, emotional, and social development of young children. Field trips are included.
133. **Laboratory in Child Development.** (1) I and II. \_\_\_\_\_  
Laboratory.  
Prerequisite or concurrent: course 132 or Psychology 112.  
Laboratory supplement to course 132 conducted at the nursery school.
134. **Child Care.** (3) II. \_\_\_\_\_  
Prerequisite: Physiology 1.  
A consideration of the physical development of children from prenatal through adolescent life, and the factors affecting health during this period. Field trips are included.
137. **Marriage and Family Relationships.** (3) II. \_\_\_\_\_  
A survey of the most recent information on courtship, mate selection, husband-wife adjustments, and parent-child relationships.
140. **Home Management.** (3) I. \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite: Physiology 1 and Psychology 1A.  
Use of time, energy, and equipment in the home from the viewpoint of the satisfaction of members of the family. Field trips are included.
- 140L. **Home Management Laboratory.** (2) I and II. \_\_\_\_\_  
Laboratory.  
Prerequisite or concurrent: course 140. Should be taken in the senior year.  
Laboratory which includes living for a period of 5 weeks under supervision in the home management house. A fee is required to cover food, lodging, and laundry.
141. **Consumers and the Market.** (3) II. \_\_\_\_\_  
Prerequisite or concurrent: Economics 1A, 1B.  
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers. Field trips are included.
142. **Social Problems of Families.** (3) I. \_\_\_\_\_  
Prerequisite: Economics 1A, 1B; statistics.  
Present-day problems of families as they are related to economic and social conditions. Field trips are included.

144. **Family Finance.** (3) II.

Prerequisite: Economics 1A, 1B; statistics.

Management of personal and family finances—money income, household production, credit, savings, investments, financing home ownership.

150. **The House.** (2) II.

Mrs. Heineman

The house considered from the family point of view; activities carried on in the home and yard by the family; space requirements for these activities; area planning; relating areas to each other in a house plan. Field trips are included.

\*152. **Home Furnishing.** (2) II.

Mrs. Heineman

Lecture and laboratory.

Prerequisite: Decorative Art 6A, 6B, 130A.

Arrangement of the house and furnishings in terms of color and design. Lectures, demonstrations, and field trips.

162. **Clothing Economics.** (3) I.

Miss Dryden

Lectures and laboratory.

Prerequisite or concurrent: courses 6 and 141.

The problems involved in the selection, purchase, and care of household textiles and clothing, of consumer protection in this field, and of the ready-to-wear and cleaning industries. Field trips are included.

175. **Clothing Design and Construction.** (3) II.

Miss Dryden

Lecture and laboratory.

Prerequisite: courses 6 and 7.

Wardrobe planning and problems in advanced clothing construction.

198. **Directed Group Study.** (1-2) II. The Staff (Mrs. Morgan in charge)199. **Special Study for Advanced Undergraduates.** (1-5) Yr.

The Staff (Mrs. Morgan in charge)

**IRRIGATION**

(Department Office, 119 Soils and Irrigation Building)

Frank J. Veihmeyer, C.E., Ph.D., *Professor of Irrigation (Chairman of the Department)*.Frank Adams, M.A., LL.D. (hon.c.), *Professor of Irrigation, Emeritus.*Robert H. Burgy, M.S., *Assistant Professor of Irrigation.*Robert M. Hagan, Ph.D., *Assistant Professor of Irrigation.*Delbert W. Henderson, Ph.D., *Assistant Professor of Irrigation.*James N. Luthin, Ph.D., *Assistant Professor of Irrigation.*Verne H. Scott, M.S., *Assistant Professor of Irrigation.*Lloyd D. Doneen, Ph.D., *Lecturer in Irrigation.*James C. Marr, B.S., *Lecturer in Irrigation.*———, *Lecturer in Irrigation.**Departmental Major Adviser.*—Mr. Veihmeyer.*The Major.*—See page 58.

\* Not to be given, 1953-1954.

## UPPER DIVISION COURSES

100. **Principles Underlying Irrigation in Its Soil and Plant Relationships.** (4) II. Mr. Hagan  
Lectures and laboratory.  
Prerequisite: Chemistry 1A, 1B; Physics 2A, 2B. Recommended: plant physiology.  
Basic principles of soil moisture and plant-soil-water relations. Movement of irrigation water in soil, methods for measuring soil-moisture content, moisture-energy concepts, and the relation of soil moisture to plant growth.
110. **Irrigation Principles and Practices.** (4) I. Mr. Henderson  
Lectures and laboratory.  
Prerequisite: Physics 2A, 2B.  
A general course for students not majoring in irrigation. 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, and water requirements of crops.
115. **Water Quality and Salinity as Factors in Irrigation.** (3) I. Mr. Doneen  
Lectures and laboratory.  
Prerequisite: Chemistry 1A, 1B. Recommended: Chemistry 5, Soil Science
106. Water quality, water analysis, salinity, soil reclamation, infiltration problems, and soil amendments.
119. **Basic Irrigation Hydraulics.** (3) II. Mr. Scott  
Prerequisite: Physics 2A, 2B; Mathematics 3A, 3B.  
Principles of fluid mechanics as applied to irrigation.
120. **Applied Irrigation Hydraulics.** (3) I. \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite: Engineering 1A, course 119. (Civil Engineering 110 or Mechanical Engineering 103 at Berkeley may be substituted for course 119.)  
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.
125. **Water Supply and Surface Hydrology.** (3) I. Mr. Burgy  
Prerequisite: Physics 2A, 2B; Geology 1.  
Hydrologic cycle, precipitation, evaporation and transpiration, relation of precipitation and watershed management to runoff, measurement of discharge, mass diagrams and duration curves, estimating stream flow, and flood flows.
130. **Ground Water, Wells, and Pumping Plants.** (3) II. Mr. Scott  
Lectures and laboratory.  
Prerequisite: Chemistry 1A, 1B; Physics 2A, 2B. Recommended: course
125. Origin and utilization of ground water, methods of estimating the sufficiency of ground water supplies, hydraulics of wells, construction of wells, and installation and operation of irrigation pumping systems.
140. **Drainage in Relation to Irrigation.** (3) I. Mr. Luthin  
Lectures and laboratory.  
Prerequisite: course 119; Mathematics 3A, 3B; Physics 2A, 2B.  
Drainage methods and principles, location of drains, construction of drainage systems with special reference to irrigated farms.



150. **Irrigation Institutions.** (3) II. Mr. Hutchins  
Water rights; kinds, acquisitions, adjudication, administration, loss, and evaluation. Irrigation enterprises; kinds, organization, financing, public regulation, operation, and usefulness under different conditions.
160. **Land Preparation and Irrigation Systems.** (4) II. Mr. Marr  
Lectures and laboratory.  
Prerequisite: Engineering 1A; courses 120, 140. Recommended: course 100.  
Principles and practices of land preparation and development for irrigation, irrigation distribution systems, water application methods, and soil-erosion control.
190. **Irrigation Proseminar.** (1) II. Mr. Veihmeyer  
Prerequisite: consent of instructor.  
Current problems in irrigation.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Veihmeyer in charge)

## GRADUATE COURSES

200. **Seminar in Plant-Soil-Water Relationships.** (1) II. Mr. Hagan  
Prerequisite: consent of instructor.  
Discussions of recent developments in problems of soil moisture and plant-soil-water relationships.
- 201A-201B. **Research in Irrigation.** (1-6; 1-6) Yr. Mr. Veihmeyer

## LANDSCAPE MANAGEMENT

(Department Office, 3 Landscape Management-Music Building)

Robert B. Deering, Ph.D., *Assistant Professor of Landscape Management*  
(*Chairman of the Department*).Robert J. Tetlow, M.S., *Instructor in Landscape Management*.———, *Instructor in Landscape Management*.*Departmental Major Adviser.*—Mr. Deering.*The Major.*—See page 60.

## LOWER DIVISION COURSES

3. **Planning the Home Grounds.** (3) II. Mr. Tetlow  
Lectures and laboratory.  
A general study of the principles and methods governing the design and construction of small properties, including the use of plant materials.
9. **The Principles and Practices in the Use of Decorative Plant Materials.** (2) II. The Staff  
Lecture and laboratory.  
The principles and practices of harvesting, storing, marketing and utilization of flowers and other decorative plant materials.

## UPPER DIVISION COURSES

104. **Garden Design and Construction.** (3) I. Mr. Tetlow  
Lectures and laboratory.  
Prerequisite: course 3, and Engineering 1A which may be taken concurrently.  
Consideration of construction problems as they relate to design. Site development and such facilities as retaining walls, steps, grading, drainage systems, and physical structures other than plant materials.

105. **Plant Materials in Garden Design.** (3) II. Mr. Deering  
Lecture and laboratory.  
Prerequisite: course 3 and Botany 1 or 12.  
A study of native and cultivated plants useful in garden design; adaptable to the various climatic areas of California, and suitable for the control of sun, wind, dust, and noise.
107. **General Floriculture.** (3) II. \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite: course 3, Botany 1 or 12 and Botany 7.  
The physiological aspects of light, temperature, water, and management practices on the growth of ornamental plants.

## LATIN

For courses in Latin see "Foreign Languages" on page 143.

## MATHEMATICS

(Department Office, 161 Home Economics Building)

Edward B. Roessler, Ph.D., *Professor of Mathematics (Chairman of the Department)*.

George A. Baker, Ph.D., *Associate Professor of Mathematics.*

Albert C. Burdette, Ph.D., *Associate Professor of Mathematics.*

Henry L. Alder, Ph.D., *Assistant Professor of Mathematics.*

Hubert A. Arnold, Ph.D., *Assistant Professor of Mathematics.*

Leonard P. Burton, Ph.D., *Assistant Professor of Mathematics.*

Curtis M. Fulton, Ph.D., *Assistant Professor of Mathematics.*

Charles A. Hayes, Jr., Ph.D., *Assistant Professor of Mathematics.*

Donald A. Norton, Ph.D., *Assistant Professor of Mathematics.*

\_\_\_\_\_, *Assistant Professor of Mathematics.*

\_\_\_\_\_, *Instructor in Mathematics.*

*Letters and Science List.*—All undergraduate courses in mathematics are included in the Letters and Science List of Courses. (See pages 79-80.)

*Major Subject Adviser.*—Mr. Burdette.

*Preparation for the Major.*—Before taking the upper division courses for the major, the student should have a basis of knowledge equivalent to Mathematics C, G, 8, 9, 3A-3B, and 4A-4B. It is desirable, therefore, that he should have completed in high school two years of algebra, plane and solid geometry, and trigonometry in order to anticipate as much of this work as possible.

*The Major.*—In the 24 units of upper division work required for the major in mathematics, the student is supposed to acquire competence in algebra, analysis, and geometry. The courses assigned for this purpose are Mathematics 111A-111B, 112A-112B, and 119A-119B, in each of which at least three units should be taken.

Subject to the above 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 a part of his major in mathematics, as well as other upper division courses in mathematics. Courses in statistics may be used as part of the mathematics major. Special attention is directed also to the courses in analytic mechanics, Physics 105A-105B.

## LOWER DIVISION COURSES

- C. Trigonometry.** (3) I and II. The Staff  
 Prerequisite: plane geometry; one and one-half years of high school algebra or course D.  
 The course includes plane trigonometry and spherical right triangles.
- D. Intermediate Algebra.** (3) I and II. The Staff  
 Prerequisite: one year of high school algebra. One and one-half years of high school algebra is advised. Not open for credit to students who have received credit for two years of high school algebra, or course 3A or 8.
- G. Solid Geometry.** (2) I. Mr. Fulton
- 3A. Plane Analytic Geometry.** (3) I and II. The Staff  
 Prerequisite: two years of high school algebra or course D; plane geometry; plane trigonometry. Students who have not had these prerequisites may take examinations in these topics at the beginning of the semester. These examinations are in addition to the qualifying examination.  
 The qualifying examination in algebra will be given at one of the regular class hours during the first week of instruction. Students who fail this test will be required to enroll in the 5-hour section (Sec. 2).
- 3B. Calculus, First Course.** (3) I and II. The Staff  
 Prerequisite: course 3A or course 11A-11B.  
 Differentiation of algebraic and transcendental functions, with applications, and introduction to integral calculus.
- 4A. Calculus, Second Course.** (3) I and II. The Staff  
 Prerequisite: course 3B.  
 Techniques of integration, with applications, indeterminate forms, infinite series of constant terms.
- 4B. Calculus, Third Course.** (3) I and II. The Staff  
 Prerequisite: course 4A.  
 Infinite series of variable terms, solid analytic geometry, partial differentiation, multiple integration.
- 8. Theory of Algebraic Equations.** (3) I. \_\_\_\_\_  
 Prerequisite: two years of high school algebra or course D; trigonometry.  
 Complex numbers, theory of equations including equations of third and fourth degrees and Sturm's theorem, determinants.
- 9. Introduction to Projective Geometry.** (3) II. Mr. Fulton  
 Prerequisite: course G or high school solid geometry and course 8 or its equivalent.  
 Projective theory of one-dimensional forms, point and line conics.
- \*10. Spherical Trigonometry.** (2) I. \_\_\_\_\_  
 Prerequisite: one and one-half years high school algebra, or course D and plane trigonometry.
- 11A-11B. Analytical Geometry and Calculus.** (3-3) Yr. Mr. Roessler  
 Prerequisite: one and one-half years of high school algebra or course D, plane geometry, and plane trigonometry.  
 The elements of analytic geometry and of differential and integral calculus.

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\* Not to be given, 1953-1954.

13. **Elementary Statistics.** (3) I and II. Mr. Alder  
 Prerequisite: two years of high school algebra or course D.  
 Arrays of experimental measurements, measures of central tendency, variation and correlation, significance of measures; elementary reliability and validity of tests.

UPPER DIVISION COURSES

102. **Selected Topics from Advanced Calculus.** (3) II. Mr. Burdette  
 Prerequisite: course 4A-4B.  
 Line and surface integrals, Fourier series, elementary aspects of complex variable theory.

105. **Statistical Methods for Biologists.** (3) II. Mr. Roessler  
 Prerequisite: course 13 or consent of the instructor.  
 Recent developments in statistical analysis, methods of sampling, design of experiments, and interpretation of results.

- \*109A-109B. **Mathematical Logic.** (3-3) Yr. \_\_\_\_\_  
 Prerequisite: course 3B or 8, or consent of the instructor.  
 Introduction (constants and variables, sentential connectives, quantifiers, identity, classes and relations). Systematic development (sentential calculus, predicate calculus with identity, examples of formalized mathematical theories). Metalogical problems (consistency, independence of axioms, completeness).

- 111A-111B. **Algebra.** (3-3) Yr. I. Mr. Alder; II. Mr. Norton  
 Prerequisite: courses 4B and 8.  
 Introduction to formal systems of modern algebra, including groups, rings, and fields; matrices and quadratic forms; ideals.

- 112A. **Higher Geometry.** (3) I. Mr. Fulton  
 Prerequisite: course 9, or consent of the instructor.  
 Homogeneous point and line coordinates, cross ratio, one- and two-dimensional projective geometry, point and line conics.

- \*112B. **Metric Differential Geometry.** (3) II. Mr. Fulton  
 Prerequisite: course 4A-4B.  
 Vector analysis, study of curves and surfaces in three dimensions.

- \*115A-115B. **The Theory of Numbers.** (3-3) Yr. Mr. Alder  
 Prerequisite: course 8.  
 Divisibility, congruences, diophantine equations; selected topics from the theory of prime numbers; partitions; continued fractions.

- 119A-119B. **Differential Equations.** (3-3) Yr. Mr. Burton  
 Prerequisite: course 4A-4B.  
 Solution of ordinary differential equations, with applications to physical and engineering problems, numerical methods, special functions. Existence theorems, systems of equations, partial differential equations.

- 122A-122B. **Advanced Calculus.** (3-3) Yr. Mr. Hayes  
 Prerequisite: course 102 or consent of the instructor.  
 Introduction to complex and real variable theory, including limit theorems, functions of several variables, line and surface integrals, series, orthogonal functions, studies of special functions.

\* Not to be given, 1953-1954.

**\*127A-127B. Foundations of Mathematics.** (3-3) Yr.

Prerequisite: course 3B or 8; recommended: course 109A-109B.

Elements of set theory (operations on sets; relations, functions, set-theoretical equivalence; cardinals, ordinals; ordering, well ordering; introduction into axiomatic foundations). Elements of theoretical arithmetic (natural numbers, integers, rationals, real numbers; basic arithmetical operations; applications of continuity principle).

To be offered only in alternate years.

**128. Numerical Analysis.** (3) II.

Mr. Arnold

Prerequisite: course 119A, or consent of instructor.

Practical aspects of computational methods for problems in applied mathematics. Finite difference methods and their applications to numerical integration, solution of equations, and numerical integration of ordinary and partial differential equations. Methods for large-scale computing systems.

**131A-131B. Statistics.** (3-3) Yr.

Mr. Baker

Prerequisite: course 4A or 11A-11B.

A basic introductory course in the theory and applications of statistical methods.

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

The Staff (Mr. Roessler in charge)

## GRADUATE COURSES

**201A-201B. Function Theory.** (3-3) Yr. I. Mr. Hayes; II. Mr. Burton

Prerequisite: courses 111A, 122A-122B.

201A: Point set theory in Euclidean spaces. The real number system. Convergence and limits. Continuous functions. Infinite convergent processes. Existence theorems. Theories of integration (Riemann, Stieltjes), and an introduction to measure and Lebesgue integration.

201B: Complex numbers, analytic functions, and classical theorems on complex variables.

**220A-220B. Differential Equations.** (3-3) Yr.

Mr. Alder

General theories, topics in ordinary and partial differential equations, boundary value problems. This course presupposes some knowledge of complex and real variable theory.

**231. Multivariate Analysis.** (3) I.

Mr. Baker

Prerequisite: course 131A-131B; recommended: course 122A.

Multivariate normal distribution, analysis of variance, correlation and regression, chi-square.

**232. Theory of Estimation and Testing Hypotheses.** (3) II.

Mr. Baker

Prerequisite: course 131A-131B; recommended: course 122A.

Estimates, asymptotic efficiency and normality, theory of statistical tests.

**250A-250B. Algebra.** (3-3) Yr.

Mr. Norton

Prerequisite: course 111A-111B.

The basic tools of commutative algebra: theory of fields; algebraic and transcendental extensions; Galois theory; valuations; ideal theory.

\* Not to be given, 1953-1954.

290. **Seminars in Mathematics.** (2-6) I and II.

The Staff (Mr. Roessler in charge)  
Topics in foundations of mathematics, theory of numbers, analysis, geometry, algebra, and probability and theory of statistics, and in their applications, by means of lectures and informal conferences with staff members.

295. **Research in Mathematics.** (2-6) I and II.

The Staff (Mr. Roessler in charge)

## **MECHANICAL ENGINEERING**

For courses in mechanical engineering see "Agricultural Engineering" on page 112.

## **MILITARY SCIENCE AND TACTICS**

(Department Office, 125 Gymnasium)

John T. Batts, Major, Infantry; *Professor of Military Science and Tactics*  
(*Chairman of the Department*).

———, *Assistant Professor of Military Science and Tactics.*

———, *Assistant Professor of Military Science and Tactics.*

———, *Assistant Professor of Military Science and Tactics.*

*Letters and Science List.*—A total of not more than 8 units of lower division courses in military science may be included in the Letters and Science List of Courses. Upper division military science courses are not included in the Letters and Science List of Courses (see pages 79-80).

### **INFANTRY**

The general objectives of the course of instruction are to produce junior officers possessing qualities and attributes essential to their progress and continued development in the United States Army Reserve and in the Regular Army. Training in military leadership is emphasized, with instruction given in subjects common to all branches of the Army during the first year of the basic course and instruction in tactics and technique of the Infantry during the second-year basic and advanced years.

### **LOWER DIVISION COURSES**

The lower division, or basic courses, are prescribed for all first-year and second-year undergraduate male students who are citizens of the United States, able-bodied, and under twenty-three years of age at the time of initial enrollment. A first- or second-year student claiming exemption because of noncitizenship, physical disability, age, or military service will present to the Registrar a petition for such exemption on the prescribed form. Pending action on his petition the student will enroll in the course prescribed for his year and enter upon the work of such course. Under certain conditions, aliens are permitted to enroll. Inquiry should be made to the Professor of Military Science and Tactics.

- 1A. **Basic (First Year).** (2) I. The Staff  
 Lectures and drill.  
 Required of all physically fit male students unless specific exemption is granted.  
 Military policy of the United States; military organization; evolution of warfare; weapons and marksmanship; leadership, drill, and exercise of command.
- 1B. **Basic (First Year).** (2) II. The Staff  
 Lectures and drill.  
 Required of all physically fit male students unless specific exemption is granted.  
 Maps and aerial photographs; first aid and hygiene; military problems of the United States; leadership, drill, and exercise of command.
- 20A. **Basic Infantry (Second Year)** (2) I. The Staff  
 Lectures and drill.  
 Prerequisite: course 1A-1B, or their equivalent.  
 Required of all physically fit male students unless specific exemption is granted.  
 Military organization; individual and crew-served weapons; marksmanship; leadership, drill, and exercise of command.
- 20B. **Basic Infantry (Second Year).** (2) II. The Staff  
 Lectures and drill.  
 Prerequisite: course 20A, or equivalent.  
 Required of all physically fit male students unless specific exemption is granted.  
 Individual and crew-served weapons; technique of fire of the rifle squad; combat formations; scouting and patrolling; tactics of the rifle squad; leadership, drill, and exercise of command.

#### UPPER DIVISION COURSES

Students who have successfully completed the basic course, or who are eligible for equivalent credit, and are under the age of twenty-seven years at the time of initial enrollment in the advanced course, may apply for admission to the advanced course. An applicant to be accepted must pass an entrance examination, a physical examination, be selected by the professor of military science and tactics and the head of the institution, and execute an agreement with the government to complete the course, including attendance at a summer camp.

During the two-year period of the advanced courses, the student will be paid commutation of subsistence in an amount prescribed by the Secretary of the Army. The United States Government furnishes arms, texts and equipment, including an officer's uniform. Acceptance by the student of the subsistence allowance, and his enrollment in upper division courses, will make the completion of the advanced course a prerequisite to graduating from the University, unless excused by authority of the Secretary of the Army.

Students successfully completing the course will be commissioned by the President of the United States as Second Lieutenants in the United States Army Reserve. Such students are also eligible to be commissioned by the Governor of the State of California in the University Cadets.

Students designated as Distinguished Military Students during their advanced course and as distinguished military graduates, upon graduation are eligible to make application for direct commission as Second Lieutenants in the Regular Army.

- 130A. **Advanced Infantry (First Year). (4) I.** Mr. Grogan  
Lectures and drill. Field trips to be arranged.  
Prerequisite: course 20B or the equivalent.  
Military organization; crew-served weapons; gunnery; leadership, drill, and exercise of command.
- 130B. **Advanced Infantry (First Year). (4) II.** Mr. Grogan  
Lectures and drill. Field trips to be arranged.  
Prerequisite: course 130A.  
Field fortifications; communications; gunnery; combat intelligence; estimate of the situation and combat orders; tactics of rifle and heavy-weapon platoons and companies; leadership, drill, and exercise of command.
- 140A. **Advanced Infantry (Second Year). (4) I.** Mr. Batts  
Lectures and drill. Field trips to be arranged.  
Prerequisite: course 130A-130B.  
Military administration; military teaching methods; military organization; communications; troop movements; motors and transportation; new developments; geographical foundations of national power; leadership, drill, and exercise of command.
- 140B. **Advanced Infantry (Second Year). (4) II.** Mr. Batts  
Lectures and drill. Field trips to be arranged.  
Prerequisite: course 140A.  
Military law and boards; supply and evacuation; command and staff; the military team; tactics of the infantry battalion in attack and defense; new developments; psychological warfare; leadership, drill, and exercise of command.

## MINERALOGY

For courses in mineralogy see "Geological Sciences" on page 146.

## MUSIC

For courses in music see below under "Music," in the next section.

## PHILOSOPHY AND FINE ARTS

(Department Office, 3 Physics Building)

Arthur H. Child, Ph.D., *Associate Professor of Philosophy (Chairman of the Department)*.

Richard L. Nelson, M.A., *Assistant Professor of Art.*

Jerome W. Rosen, M.A., *Instructor in Music.*

———, *Instructor in Art.*

———, *Instructor in Music.*

## ART

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

### LOWER DIVISION COURSES

1A. **History of Ancient Mediterranean Art. (3) I.** \_\_\_\_\_

From the Stone Age to the end of the Roman Empire. Field trips are included.



- 1B. **History of Medieval, Renaissance, and Modern Art—Emphasis on Painting.** (3) II. \_\_\_\_\_  
Field trips are included.
- 1C. **History of Medieval, Renaissance, and Modern Art—Emphasis on Architecture and Sculpture.** (3) I. \_\_\_\_\_  
Field trips are included.
- 1D. **History of Oriental Art.** (3) II. \_\_\_\_\_  
The art of India, China, and Japan. Field trips are included.
- 2A-2B. **Elementary Form and Color.** (2-2) Yr. Mr. Nelson  
Laboratory.  
Beginning each semester.  
2A: Form in composition using black and white media.  
2B: Introduction to color in composition.  
Field trips are included.
- 3A-3B. **Intermediate Form and Color.** (2-2) Yr. Mr. Nelson  
Laboratory.  
Beginning each semester.  
Prerequisite: course 2A-2B.  
Field trips are included.  
3A: Color and form in composition.  
3B: Form in composition using the human figure as subject.
10. **An Introduction to Art.** (2) I. Mr. Nelson  
The understanding and appreciation of painting, sculpture, architecture, and industrial art.  
Field trips are included.

## UPPER DIVISION COURSES

- 102A-102B. **Advanced Drawing and Painting.** (2-2) Yr. Mr. Nelson  
Laboratory.  
Prerequisite: courses 2A-2B, 3A-3B. Course 102A is not prerequisite to 102B.  
Composition with the human figure as a basic motif. Paintings in various media including oil, tempera, gouache, and wax.  
Field trips are included.
183. **European Painting in the Nineteenth Century.** (2) II. \_\_\_\_\_  
Field trips are included.
199. **Special Study for Advanced Undergraduates.** (1-4) I and II.  
The Staff (Mr. Nelson in charge)

## MUSIC

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80), with a total of not more than 8 units from performance courses.

## LOWER DIVISION COURSES

- A. **Musicianship.** (2) I. \_\_\_\_\_  
Elements of music, with ear training, sight singing, and dictation.
- 1A. **Musicianship.** (2) II. \_\_\_\_\_  
A continuation of course A, which is prerequisite.

2. **Elementary Counterpoint.** (3) I. Mr. Rosen  
 Prerequisite: course A (may be taken concurrently) or consent of the instructor.  
 Sixteenth-century polyphony: theory and practice. Preparatory exercises and motet writing.
- 3A. **Elementary Harmony.** (3) II. Mr. Rosen  
 Prerequisite: courses 2 and 1A (may be taken concurrently) or consent of the instructor.  
 Studies in tonal organization with emphasis on chords, their construction and progression. Lectures and written exercises.
- \*21A-21B. **History and Literature of Music.** (3-3) Yr. \_\_\_\_\_  
 Prerequisite: courses 2 and 3A, or consent of the instructor.  
 A study of the development of music from antiquity to the present; lectures, listening, technical analysis, and written reports.
- 27A-27B. **Introduction to Musical Literature.** (2-2) Yr. \_\_\_\_\_  
 Course 27A is not prerequisite to 27B.  
 Lectures, illustrations, and readings designed to furnish a general appreciation of music. Intended primarily for students whose major is not music.
41. **University Symphony Orchestra.** (2) I and II. Mr. Rosen  
 Two hour-and-a-half rehearsals and one section hour per week.  
 Open to any student in the University whose technical proficiency meets the requirements of concert performance.  
 Rehearsal and performance of symphonic music. May be repeated once without duplication of credit.
43. **University Concert Band.** (2) II. Mr. Rosen  
 Two hour-and-a-half rehearsals and one section hour per week.  
 Open to any student in the University whose technical proficiency meets the requirements of concert performance.  
 Rehearsal and performance of band music. May be repeated once without duplication of credit.  
 In the fall semester, band practice and performance will be offered as an activity, rather than a course, with one two-hour rehearsal per week.
44. **University Chorus.** (2) I and II. \_\_\_\_\_  
 Two hour-and-a-half rehearsals and one section hour per week.  
 Rehearsal and performance of choral music. May be repeated once without duplication of credit.
46. **Chamber Music Ensemble.** (1) II. \_\_\_\_\_  
 Two one-hour rehearsals per week.  
 Open to any student in the University of sufficient technical ability to take part in ensemble combinations for strings, wind instruments, piano.  
 May be repeated once without duplication of credit.

**PHILOSOPHY**

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

**LOWER DIVISION COURSES**

- 6A-6B. **Introduction to Philosophy.** (3-3) Yr. Mr. Child  
 Course 6A is prerequisite to 6B.

\* Not to be given, 1958-1954

- 20A-20B. **History of Philosophy.** (3-3) Yr. Mr. Child  
 I. From the Pre-Socratics to Plotinus.  
 II. From the Scholastics to Kant.
- UPPER DIVISION COURSES
104. **Ethics.** (3) I. Mr. Child  
 A study of principles of conduct.
138. **Philosophy of Art.** (3) II. Mr. Child  
 Prerequisite: two units of Art 10, or of Music 27A-27B, or the consent of the instructor.  
 A study and discussion of problems and theories concerning aesthetics.

## PHYSICAL EDUCATION

(Department Office, 204 Gymnasium)

Irving F. Toomey, B.S., *Supervisor of Physical Education (Chairman of the Department)*.

Vernard B. Hickey, A.B., *Associate Supervisor of Physical Education.*

George A. Stromgren, M.S., *Associate Supervisor of Physical Education.*

Eugene S. Wilson, B.S., *Associate Supervisor of Physical Education.*

Theodore W. Forbes, M.S., *Assistant Supervisor of Physical Education.*

Willard S. Lotter, A.B., *Assistant Supervisor of Physical Education.*

Myron R. Schall, A.B., *Assistant Supervisor of Physical Education.*

Marya Welch, Ed.D., *Assistant Supervisor of Physical Education.*

The incidental fee payable by all students at the time of registration, entitles students to the use of the gymnasium, swimming pool, showers, towels, lockers, tennis courts, and the athletic fields. Equipment for games and sports is available for exercise and recreation, either with or without instruction. Courses may be elected with or without academic credit.

Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulations of the department.

### LOWER DIVISION COURSE FOR MEN

#### 1. **Physical Education for Men.** ( $\frac{1}{2}$ ) I and II.

Mr. Toomey, Mr. Forbes, Mr. Hickey, Mr. Schall,  
 Mr. Stromgren, Mr. Wilson

Sections meet twice weekly at hours to be arranged.

Sections are organized in baseball, basketball, boxing, football, golf, riding, soccer, tennis, touch football, track, wrestling, swimming, lifesaving, and water sports. Men qualified for athletics may enroll in any sport pursued at Davis, such as football and basketball, and receive credit for this elective.

This course may be repeated for credit not to exceed a total of 4 units.

### LOWER DIVISION COURSE FOR WOMEN

#### 26. **Physical Education for Women.** ( $\frac{1}{2}$ ) I and II.

Miss Welch

Sections meet twice weekly at hours to be arranged.

Sections are organized in archery, badminton, volleyball, riding, swimming, lifesaving, and swimming formations.

This course may be repeated for credit not to exceed a total of 4 units.

## LOWER DIVISION COURSES FOR MEN AND WOMEN

- 5A. **First Aid.** (1) I and II. Mr. Hickey, Mr. Wilson, Mr. Stromgren  
Standard course. Upon successful completion of the course, the Red Cross Certificate is awarded.
- 5B. **Advanced First Aid.** (No credit) I.  
Prerequisite: course 5A. Mr. Hickey, Mr. Wilson, Mr. Stromgren  
Sections meet two hours weekly for eight weeks. Upon successful completion of the course, the Red Cross Certificate is awarded.
24. **Theory of Teaching of Swimming, Diving, and Water Polo.** (1) I and II.  
Lecture and laboratory. Mr. Hickey  
Prerequisite: course 1 in swimming or the equivalent.  
Skills and teaching technique.
25. **The Theory and Teaching of Lifesaving and Water Safety.** (1) I and II.  
Lecture and laboratory. Mr. Hickey  
Prerequisite: course 24 or the equivalent, and Red Cross Life Saving Certificate.  
Upon successful completion of the course, the Red Cross Certificate of Completion is awarded.

## PHYSICS

(Department Office, 2 Physics Building)

Milton E. Gardner, Ph.D., *Associate Professor of Physics.*Charles G. Patten, Ph.D., *Associate Professor of Physics (Chairman of the Department).*David B. Beard, Ph.D., *Assistant Professor of Physics.*John A. Jungerman, Ph.D., *Assistant Professor of Physics.*———, *Instructor in Physics.*

*Letters and Science List.*—All undergraduate courses in physics are included in the Letters and Science List of Courses (see pages 79–80).

*Major Subject Adviser.*—Mr. Patten.

*Preparation for the Major.*—Required: Physics 4A, 4B, 4C, or the equivalent; Chemistry 1A–1B, Mathematics 3A–3B, 4A–4B, or their equivalent. Recommended: Mathematics 8 and a reading knowledge of French and German.

*The Major.*—The major must include Physics 105A–105B, 108B, 110A–110B, 115, 121, and Mathematics 102 and 119A. 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.

## LOWER DIVISION COURSES

Physics 4A, 4B, 4C are fundamental and are designed to meet the needs of students whose major is physics and of students preparing for applications

of physics in the colleges of Engineering and Chemistry. After completing 4A, the order of taking 4B and 4C is immaterial.

Prerequisite for all lower division courses: (1) either high school physics or chemistry; (2) trigonometry (may be taken concurrently).

**2A. General Physics Lecture.** (3) I and II. ———, Mr. Beard

I. (———).

II. (Beard).

Prerequisite: (1) either high school physics or chemistry; (2) trigonometry (may be taken concurrently).

Elective in the College of Letters and Science. Required for premedical students.

Mechanics, properties of matter, heat, and sound.

**2B. General Physics Lecture.** (3) I and II. Mr. Beard, ———

I. (Beard).

II. (———).

Prerequisite: course 2A.

Elective in the College of Letters and Science. Required for premedical students.

Properties of light, electricity, magnetism, and atomic and nuclear physics.

**3A. General Physics Laboratory.** (1) I and II. ———, Mr. Beard

I. (———). Laboratory.

II. (Beard). Laboratory.

Required for premedical students. Recommended for all students who elect course 2A.

Mechanics, properties of matter, heat, and sound. Experimental work planned to accompany the lectures in course 2A.

**3B. General Physics Laboratory.** (1) I and II. Mr. Beard, ———

I. (Beard). Laboratory.

II. (———). Laboratory.

Required for premedical students. Recommended for all students who elect course 2B.

Properties of light, electricity, magnetism, and atomic and nuclear physics. Experimental work planned to accompany the lectures in course 2B.

**4A. General Physics.** (4) II. Mr. Gardner

Lectures and laboratory.

Prerequisite: (1) high school physics or chemistry; (2) Mathematics 3A-3B, or its equivalent. Mathematics 3B may be taken concurrently.

Open to students in all colleges. Together with courses 4B-4C, required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.

Mechanics, properties of matter.

**4B. General Physics.** (4) I. Mr. Gardner

Lectures and laboratory.

Prerequisite: course 4A.

Open to students in all colleges. Required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.

Electricity and magnetism.

- 4C. General Physics. (4) II.** Mr. Patten  
Lectures and laboratory.  
Prerequisite: course 4A.  
Open to students in all colleges. Required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.  
Heat, wave motion, sound, and light.

## UPPER DIVISION COURSES

Courses 4A, 4B, 4C and differential and integral calculus are prerequisite to all upper division courses, except course 107.

- 104. Vector Analysis. (3) I.** Mr. Beard  
Elements of vector and tensor analysis with applications to physics.
- 105A-105B. Analytic Mechanics. (3-3) Yr.** Mr. Patten  
Fundamental principles of Newtonian mechanics.
- 107. Introduction to Electronics. (3) I.** Mr. Gardner  
Prerequisite: course 2B, or equivalent.  
Elementary principles of single-phase alternating-current circuits, characteristics of thermionic tubes and a study of simple electronic circuits.
- 108B. Physical Optics. (3) II.** \_\_\_\_\_  
Lectures and laboratory.  
Prerequisite: general upper division prerequisites.  
The phenomena of diffraction, interference, and polarization of light, and their applications.
- 110A-110B. Electricity and Magnetism. (3-3) Yr.** Mr. Jungerman  
Elementary and mathematical theory of electrostatics, magnetostatics, magnetism, steady and varying currents, electron theory, and electromagnetic waves.
- \*112. Heat. (3) I.** Mr. Patten  
The thermal properties of matter, with an introduction to the mathematical theory of heat conduction, the kinetic theory of matter, and thermodynamics.  
Given in the fall semester of even-numbered years.
- 115. Introduction to Quantum Mechanics. (3) II.** Mr. Beard  
Prerequisite: course 105A, 121.  
The classical background, basic ideas, and methods of quantum mechanics, with applications to atomic physics.
- 121. Introduction to Atomic Structure. (3) II.** Mr. Gardner  
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.
- 129A-129B. Nuclear Physics. (3-3) Yr.** Mr. Jungerman  
Prerequisite: course 121.  
Natural and artificial radioactivity, nuclear radiations and their interaction with matter, general properties of nuclei and the theory of nuclear structure, high energy physics, mesons.

\* Not to be given, 1953-1954.

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

The Staff (Mr. Gardner in charge)

All special work of upper division grade not included in courses announced above.

## GRADUATE COURSE

**290. Seminar. (1-3) I and II.**

The Staff (Mr. Gardner in charge)

Advanced study in various fields of modern physics. Topics will vary from year to year.

**PHYSIOLOGY**

For courses in Physiology see "Zoölogy" on page 185.

**PLANT PATHOLOGY**

(Department Office, 258 Hunt Hall)

Max W. Gardner, Ph.D., D.Sc. (hon. c.), *Professor of Plant Pathology (Chairman of the Department) Berkeley campus.*James B. Kendrick, Sr., Ph.D., *Professor of Plant Pathology (Vice-Chairman of the Department).*Lysle D. Leach, Ph.D., *Professor of Plant Pathology.*Edward E. Wilson, Ph.D., *Professor of Plant Pathology.*William H. English, Ph.D., *Associate Professor of Plant Pathology.*William B. Hewitt, Ph.D., *Associate Professor of Plant Pathology.*Byron R. Houston, Ph.D., *Associate Professor of Plant Pathology.*\*John W. Oswald, Ph.D., *Associate Professor of Plant Pathology.*Raymond G. Grogan, Ph.D., *Assistant Professor of Plant Pathology.*George Nyland, Ph.D., *Assistant Professor of Plant Pathology.**Letters and Science List.*—Plant Pathology 124A-124B.*Departmental Major Advisers.*—Mr. English, Mr. Houston.*The Major.*—See page 61.

## UPPER DIVISION COURSES

**120. Plant Diseases. (4) I and II.** I. Mr. Grogan; II. Mr. Houston

Lectures and laboratory.

Prerequisite: Botany 1. Recommended: Bacteriology 2.

A general course on the nature, cause, and control of plant diseases.

**122. Plant Pathology Methods. (3) I.**

Mr. Hewitt

Lecture and laboratory.

Prerequisite: course 120.

The laboratory methods and techniques used in the study of plant diseases.

**124A-124B. Pathogenic Fungi. (3-3) Yr.** I. Mr. Nyland; II. Mr. English

Lecture and laboratory.

Prerequisite: Botany 14 or course 120.

The morphology and taxonomy of the fungi with special emphasis on plant pathogens.

\* Absent on leave, 1953-1954.

125A-125B. **Diseases of Crop Plants.** (3-3) Yr.

Mr. Kendrick, Mr. Wilson, Mr. Oswald

125A. Field and Truck Crops. Mr. Oswald, Mr. Kendrick.

125B. Fruit, Nut, and Vine Crops. Mr. Wilson.

Lecture and laboratory.

Prerequisite: course 120.

The pathology of important crop plants. Diagnosis, host reaction, factors influencing inception and severity of the disease, dissemination and control. Frequent field trips are required.

128. **Advanced Plant Pathology.** (3) II.

Mr. Leach

Prerequisite: courses 122, 124A-124B.

A study of the factors influencing pathogenicity and of the reaction of host plants to disease.

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

The Staff (Mr. Kendrick in charge)

GRADUATE COURSES

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

The Staff (Mr. Hewitt in charge)

230A-230B. **Research in Plant Pathology.** (1-6; 1-6) Year.

The Staff

## POLITICAL SCIENCE

For courses in political science see "History and Political Science" on page 149.

## POMOLOGY

(Department Office, 201 Horticulture Building)

Frank W. Allen, M.S., *Professor of Pomology.*

Lawrence L. Claypool, Ph.D., *Professor of Pomology.*

Luther D. Davis, Ph.D., *Professor of Pomology.*

E. Louis Proebsting, Ph.D., *Professor of Pomology.*

Warren P. Tufts, Ph.D., *Professor of Pomology (Chairman of the Department).*

Reid M. Brooks, Ph.D., *Associate Professor of Pomology.*

Julian C. Crane, Ph.D., *Associate Professor of Pomology.*

Dillon S. Brown, Ph.D., *Assistant Professor of Pomology.*

William H. Griggs, Ph.D., *Assistant Professor of Pomology.*

Carl J. Hansen, M.S., *Assistant Professor of Pomology.*

Richard W. Harris, Ph.D., *Assistant Professor of Pomology.*

Hudson T. Hartmann, Ph.D., *Assistant Professor of Pomology.*

Claron O. Hesse, Ph.D., *Assistant Professor of Pomology.*

Dale E. Kester, Ph.D., *Instructor in Pomology.*



Arthur H. Hendrickson, Ph.D., *Lecturer in Pomology.*

Omund Lilleland, Ph.D., *Lecturer in Pomology.*

Harold P. Olmo, Ph.D., *Professor of Viticulture.*

Eugene F. Serr, B.S., *Lecturer in Pomology.*



*Departmental Major Advisers.*—Mr. Brooks, Mr. Brown, Mr. Crane.  
*The Major.*—See page 61.

## LOWER DIVISION COURSES

2. **Principles of Fruit Growing.** (3) I. Mr. Davis  
 Prerequisite: Botany 1 or 12.  
 An introduction to the principles underlying the behavior of fruit trees, their response to environment and cultural operations.
12. **General Fruit Growing.** (3) I. Mr. Hansen  
 Lectures and laboratory.  
 Not open to students with a major in Pomology or to those who have completed course 2.  
 A survey of the fruit industry, including climatic influences, varieties, rootstocks, and cultural practices.

## UPPER DIVISION COURSES

105. **Fruit Handling and Varieties.** (5) Mr. Harris, Mr. Kester  
 Eight lectures; eight laboratory periods.  
 Prerequisite: course 2, or 12.  
 A six weeks' summer course beginning August 3, 1953.  
 Fruit handling practices and summer orchard operations emphasizing the characteristic differences of certain species and varieties of fruit. Field trips to the important deciduous fruit-growing districts of California will be included.  
 The course will be offered in the summer of odd-numbered years. Students should register with the instructor on or before June first of the preceding spring semester.
- 106A-106B. **Fruit Plants.** (2-2) Yr. I. Mr. Crane; II. Mr. Brown  
 Lecture and laboratory.  
 Prerequisite: course 2. Course 106A is not prerequisite to 106B.  
 Fruit-growing practices, emphasizing the characteristic differences of certain species of fruit plants.
107. **Small-Fruit Culture.** (2) I. \_\_\_\_\_  
 Prerequisite: course 2.  
 Principles and practices of growing strawberries and bush fruits with special reference to climatic and soil requirements; selection of varieties and sites is emphasized; propagation, planting, cultural methods, harvesting, and preparation for market. Field trips may be arranged.
109. **Plant Propagation.** (2) II. Mr. Hartmann  
 Lecture and laboratory.  
 Prerequisite: Botany 1 or 12; course 2 or 12, or Landscape Management
107. Principles of propagation with special reference to horticultural plants.
110. **Fruit Morphology.** (3) I. Mr. Brooks  
 Lecture and laboratory.  
 Prerequisite: Botany 1.  
 The morphological development of the flower, fruit, and seed of more than thirty typical horticultural species.
112. **Handling, Storage, and Transit of Fruits.** (3) I.  
 Lectures and laboratory. Mr. Allen, Mr. Claypool  
 Prerequisite: course 2 and Botany 7.

Fundamentals of certain fruit-handling operations; fruit maturity; pre-cooling; fruit storage and transportation. Particular emphasis is given to the physiological principles underlying these postharvest practices.

114. **Fruit Breeding.** (3) II. Mr. Olmo  
 Lectures and laboratory.  
 Prerequisite: course 2; Genetics 100.  
 The genetics and cytology of fruit species in relation to varietal improvement, including a study of sterility, incompatibility, interspecific hybridization, and clonal selection in fruit varieties.
121. **Advanced Pomology.** (3) II. Mr. Proebsting  
 Prerequisite: course 2; Botany 7; consent of the instructor.  
 The physiology of fruit trees, their response to environment and to cultural operations.
198. **Directed Group Study in Experimental Pomology.** (2) I. Mr. Hesse  
 Prerequisite: 3 units upper division work in pomology completed; consent of the instructor.  
 A critical review and discussion of horticultural research in selected fields. Emphasis is placed on criticism of methods and their application, validity of conclusions, and relation to the development of the field of study.
199. **Special Study for Advanced Undergraduates in Pomology.**  
 (1-5) I and II. The Staff (Mr. Tufts in charge)

GRADUATE COURSES

- 201A-201B. **Research in Pomology.** (1-6; 1-6) Yr. The Staff  
 205A-205B. **Seminar.** (1-1) Yr. Mr. Davis

**POULTRY HUSBANDRY**

(Department Office, Poultry Building)

- Vigfus S. Asmundson, Ph.D., *Professor of Poultry Husbandry.*  
 George F. Stewart, Ph.D., *Professor of Poultry Husbandry (Chairman of the Department).*  
 Frank H. Kratzer, Ph.D., *Associate Professor of Poultry Husbandry.*  
 Frederick W. Lorenz, Ph.D., *Associate Professor of Poultry Husbandry.*  
 Arthur H. Smith, Ph.D., *Assistant Professor of Poultry Husbandry.*  
 Wilbor O. Wilson, Ph.D., *Assistant Professor of Poultry Husbandry.*  
 Daniel W. Peterson, Ph.D., *Instructor in Poultry Husbandry.*

*Departmental Major Adviser.*—Mr. Wilson.  
*The Major.*—See page 54.

LOWER DIVISION COURSES

1. **Poultry Production.** (3) I. Mr. Wilson  
 Lectures and laboratory.  
 An introductory study of the relation of the several sciences underlying poultry production to flock management.
48. **Poultry Management Practice.** (1-3) I and II; Summer Session.  
 Laboratory. The Staff (Mr. Smith in charge)  
 Prerequisite: course 1.  
 Practice and directed study of poultry management; incubation of eggs;

brooding and rearing management of chicks and poults and culling of the laying flock; artificial insemination; chicken and turkey meat production; poultry products technology and marketing. Field trips will be made to poultry ranches, hatcheries, feed mills, processing plants, etc., as applicable.

May be repeated up to a total of 4 units credit.

#### UPPER DIVISION COURSES

103. **Poultry Breeding.** (3) I. Mr. Asmundson  
Prerequisite: Genetics 100.  
Inheritance in poultry and study of the application of genetic principles to problems in poultry breeding (chickens and turkeys).
104. **Poultry Feeds and Feeding.** (3) I. Mr. Kratzer  
Lectures and laboratory.  
Prerequisite: Animal Husbandry 101 or Chemistry 101.  
A study of the manufacture, composition, and use of poultry feedstuffs; elementary feed analysis.
107. **Avian Physiology.** (2) II. Mr. Lorenz  
Prerequisite: Physiology I and 1L or Animal Husbandry 110 or equivalent; Zoölogy 1B.  
Physiology of the various systems of birds with emphasis on reproduction, digestion, metabolism, and endocrinology.
108. **Avian Physiology Laboratory.** (1) II. Mr. Smith  
Laboratory.  
Prerequisite: course 1, 107 (may be taken concurrently); consent of the instructor.  
Selected problems in physiology of birds.
112. **Poultry Meat Production.** (3) II. Mr. Asmundson  
Prerequisite: course 1; senior standing in Animal Science or consent of instructor.  
The relation of heredity, nutrition, physiology and environment to the breeding, feeding and management of poultry for meat production with particular reference to turkeys and chickens.
149. **Environmental Physiology of Domestic Animals.** (2) II. Mr. Wilson  
Prerequisite: Zoölogy 1A, 1B.  
The relation of environmental factors on physiological processes related to animal production.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Stewart in charge)  
Prerequisite: course 1; courses basic to problem elected; consent of the instructor.  
Problems may be elected relating to the nutrition, breeding, incubation, physiology, and egg quality of chickens or turkeys.

#### RELATED COURSES

- Economic Analysis in Agriculture** (Agricultural Economics 100A)  
**Agricultural Finance** (Agricultural Economics 110)  
**Economics of Farm Management** (Agricultural Economics 170A)  
**Principles of Pathology and Control of Diseases of Domestic Animals** (Veterinary Science 111)  
**Poultry Pathology Laboratory** (Veterinary Science 112)

## GRADUATE COURSES

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

The Staff (Mr. Stewart in charge)

202A-202B. **Seminar in Animal Physiology.** (1-1) Yr.

Mr. Lorenz

Advanced topics (which may change from time to time) and trends in research will be discussed. Students will be expected to prepare and present reports to the seminar.

**PSYCHOLOGY**

(Department Office, ———)

William F. Dukes, Ph.D., *Assistant Professor of Psychology (Chairman of the Department).*



Charles W. Bursch, II, A.B., *Lecturer in Education.*

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses (see pages 79-80).

## LOWER DIVISION COURSES

1A. **General Psychology.** (3) I. \_\_\_\_\_

An introduction to the facts and principles of psychology.

1B. **General Psychology.** (3) II. \_\_\_\_\_

Prerequisite: course 1A.

A continuation of course 1A with a detailed treatment of the application of the scientific method in the study of behavior. Basic assumptions, limitations, and advantages of the method of experiment. Intended primarily for prospective major students.

33. **Personal and Social Adjustment.** (3) II. \_\_\_\_\_

Prerequisite: course 1A.

A continuation of course 1A, intended primarily for students who will not major in psychology. The dynamics of normal personality development. Family relationships, social adjustment, and self-evaluation are emphasized.

## UPPER DIVISION COURSE

100A-100B. **Survey of General Psychology.** (3-3) Yr. \_\_\_\_\_

Lectures and laboratory.

Prerequisite: course 1A, 1B, and Mathematics 13.

A comprehensive survey of the fundamentals of general psychology at an advanced level. Consideration of the facts and principles of behavior which form a common basis for the various special fields of psychology.

**SOCIOLOGY**

For courses in sociology see "Economics, Geography, and Sociology" on page 131.

## SOILS

(Department Office, 241 Soils and Irrigation Building)

Geoffrey B. Bodman, Ph.D., *Professor of Soil Physics (Chairman of the Department) Berkeley campus.*

Lannes E. Davis, Ph.D., *Associate Professor of Soils (Vice-Chairman of the Department).*



Arthur L. Brown, Ph.D., *Lecturer in Soils.*

John P. Conrad, Ph.D., *Professor of Agronomy.*

Robert M. Hagan, Ph.D., *Assistant Professor of Irrigation.*

Frank J. Veihmeyer, C.E., Ph.D., *Professor of Irrigation.*

*Letters and Science List.*—Soil Science 106, 110.

*Departmental Major Adviser.*—Mr. Brown.

*The Major.*—See page 68.

### SOIL SCIENCE

#### UPPER DIVISION COURSES

106. **Elements of Soil Science.** (4) II. Mr. Davis

Lectures and laboratory.

Three off-campus field trips are required.

Prerequisite: Chemistry 1A.

The origin and properties of soil-forming rocks; the earth's surface features with special reference to soils and land use; development of soil as a natural body; soil profiles; physical, chemical, and biological properties of soil; soil structure; soil classification; soil mapping; a brief treatment of soil management.

110. **The Soil as a Medium for Plant Growth.** (4) I. Mr. Conrad

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 plants; current theory of the soil solution.

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

The Staff (Mr. Davis in charge)

#### RELATED COURSE

**Principles Underlying Irrigation in Its Soil and Plant Relationships** (Irrigation 100)

#### GRADUATE COURSE

200A-200B. **Research in Soil Science.** (1-6; 1-6) Yr. The Staff

## SPANISH

For courses in Spanish see "Foreign Languages" on page 143.

## SPEECH

For courses in speech see "English, Dramatic Art, and Speech" on page 136.

## SUBJECT A

For courses in Subject A see "English, Dramatic Art, and Speech" on page 137.

### VEGETABLE CROPS

(Department Office, 152 Hunt Hall)

James E. Knott, Ph.D., Sc.D.(hon.c.), *Professor of Vegetable Crops (Chairman of the Department)*.

John H. MacGillivray, Ph.D., *Professor of Vegetable Crops*.

Glen N. Davis, Ph.D., *Associate Professor of Vegetable Crops*.

James F. Harrington, Ph.D., *Associate Professor of Vegetable Crops*.

Oscar A. Lorenz, Ph.D., *Associate Professor of Vegetable Crops*.

Louis K. Mann, Ph.D., *Associate Professor of Vegetable Crops*.

Leonard L. Morris, Ph.D., *Associate Professor of Vegetable Crops*.

Charles M. Rick, Jr., Ph.D., *Associate Professor of Vegetable Crops*.

Paul G. Smith, Ph.D., *Associate Professor of Vegetable Crops*.

Harlan K. Pratt, Ph.D., *Assistant Professor of Vegetable Crops*.

Arthur R. Spurr, Ph.D., *Instructor in Vegetable Crops*.



Alden S. Crafts, Ph.D., *Professor of Botany*.

Katherine Esau, Ph.D., *Professor of Botany*,

Gordie C. Hanna, B.S., *Lecturer in Vegetable Crops*.

James E. Welch, Ph.D., *Lecturer in Vegetable Crops*.

Masatoshi Yamaguchi, Ph.D., *Lecturer in Vegetable Crops*.

*Departmental Major Advisers.*—Mr. Davis, Mr. Lorenz.  
*The Major.*—See page 61.

#### LOWER DIVISION COURSES

1. **Vegetable Production.** (3) II. Mr. MacGillivray  
Principles involved in vegetable production; survey of the vegetable industry.

2. **Laboratory in Principles of Vegetable Crops Production.** (1) II. Mr. MacGillivray  
Laboratory.  
Prerequisite: course 1, which may be taken concurrently.  
A laboratory course involving a study of the methods used in seeding, propagation and culture of vegetables, and the application of the principles underlying vegetable production techniques. One or more field trips will be made.

#### UPPER DIVISION COURSES

105. **Systematic Olericulture.** (3) I. Mr. Smith, Mr. Welch  
Laboratory and discussion period.  
Prerequisite: course 1; Botany 1.  
Origin, history, types, classification, nomenclature, adaptation, and judging of the more important American vegetable varieties. One or more field trips will be made.

112. **Handling, Storage, and Transit of Vegetables.** (3) I. Mr. Morris  
Lectures and laboratory.  
Prerequisite: course 1; Botany 7.  
Physiological processes contributing to the postharvest deterioration of vegetables and their relation to practices involved in harvesting, packing, transit, storage, and marketing. One or more field trips will be made.
118. **Vegetable Seed Production.** (2) II. Mr. Harrington  
Prerequisite: course 1.  
Principles and techniques of vegetable seed production; factors affecting induction of seeding, development of seed crops, viability and longevity of seed. One or more field trips will be made.
120. **Vegetable Breeding.** (3) II. Mr. Rick, Mr. Spurr  
Lectures and laboratory.  
Prerequisite: course 1; Genetics 100. Recommended: course 105.  
Genetics, cytology, reproductive mechanisms, floral morphology, and field-plot techniques as related to the improvement of the vegetable crop species. One or more field trips will be made.
121. **Vegetable Physiology.** (3) II. Mr. Mann, Mr. Pratt  
Lectures and laboratory.  
Prerequisite: course 1; Botany 7.  
Physiological principles involved in the production of vegetables.
122. **Advanced Vegetable Crops.** (3) I. Mr. Lorenz  
Prerequisite: course 1.  
Methods of production and handling of the principal California vegetable crops, including the application of pertinent experimental evidence.
190. **Proseminar.** (1) II. Mr. Knott  
Prerequisite: consent of instructor.  
Current problems and research in vegetable production.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Knott in charge)

## GRADUATE COURSES

- 200A-200B. **Research in Vegetable Crops.** (1-6; 1-6) Yr. The Staff
- 201A-201B. **Seminar in Vegetable Crops.** (1-1) Yr. Mr. Spurr

**VETERINARY SCIENCE**

(Department Office, 1018 Veterinary Science Building)

- Hugh S. Cameron, D.V.M., Ph.D., *Professor of Veterinary Science.*  
George H. Hart, V.M.D., M.D., *Professor of Veterinary Science (Chairman of the Department).*  
S. Anderson Peoples, M.D., *Professor of Comparative Pharmacology.*  
Oscar W. Schalm, D.V.M., Ph.D., *Professor of Veterinary Science.*  
William H. Boynton, D.V.M., *Professor of Veterinary Science, Emeritus.*  
Jacob Traum, D.V.M., M.S., *Professor of Veterinary Science, Emeritus.*  
Raymond A. Bankowski, D.V.M., Ph.D., *Associate Professor of Veterinary Science.*  
John F. Christensen, D.V.M., Ph.D., *Associate Professor of Veterinary Science.*  
Donald R. Cordy, D.V.M., Ph.D., *Associate Professor of Veterinary Science.*

- James R. Douglas, Ph.D., *Associate Professor of Parasitology.*  
 Louis W. Holm, Ph.D., *Associate Professor of Veterinary Medicine.*  
 Donald E. Jasper, D.V.M., Ph.D., *Associate Professor of Veterinary Medicine.*  
 John D. Wheat, D.V.M., *Associate Professor of Veterinary Medicine.*  
 Theodore J. Hage, D.V.M., M.S., *Assistant Professor of Veterinary Medicine.*  
 Jack A. Howarth, D.V.M., Ph.D., *Assistant Professor of Veterinary Medicine.*  
 Logan M. Julian, D.V.M., Ph.D., *Assistant Professor of Veterinary Science.*  
 John W. Kendrick, D.V.M., *Assistant Professor of Veterinary Science.*  
 Delbert G. McKercher, D.V.M., Ph.D., *Assistant Professor of Veterinary Medicine.*  
 Clyde N. Stormont, Ph.D., *Assistant Professor of Veterinary Science.*  
 Roland F. Vetter, D.V.M., *Acting Assistant Professor of Veterinary Science.*  
 Arthur L. Black, Ph.D., *Instructor in Veterinary Medicine.*  
 George A. Linton, D.V.M., *Instructor in Veterinary Medicine.*  
 Jack E. Moulton, D.V.M., *Acting Instructor in Veterinary Science.*



- Norman F. Baker, D.V.M., *Lecturer in Veterinary Medicine.*  
 John B. Enright, Ph.D., *Lecturer in Veterinary Science.*  
 Earl H. Gray, M.D., *Lecturer in Radiology.*  
 William J. Mathey, Jr., V.M.D., Ph.D., *Lecturer in Veterinary Science.*  
 Blaine McGowan, Jr., D.V.M., *Lecturer in Veterinary Medicine.*  
 John W. Osebold, D.V.M., *Lecturer in Veterinary Science.*  
 Edward A. Rhode, Jr., D.V.M., *Lecturer in Veterinary Medicine.*  
 Walter W. Sadler, D.V.M., *Lecturer in Veterinary Medicine.*  
 Walter S. Tyler, D.V.M., *Lecturer in Veterinary Medicine.*  
 Donald V. Zander, D.V.M., M.S., *Lecturer in Veterinary Medicine.*

*Letters and Science List.—Veterinary Science List.—Veterinary Science 124, 140—140L.*

*Departmental Major Advisers.—Mr. Bankowski, Mr. Cameron, Mr. Cordy, Mr. Douglas, Mr. Hage, Mr. Holm, Mr. Howarth, Mr. Jasper, Mr. Julian, Mr. McKercher, Mr. Peoples.*

*The Major.—See page 87.*

## VETERINARY SCIENCE

### UPPER DIVISION COURSES

102. **Veterinary Biochemistry Laboratory.** (2) II. Mr. Black  
 Laboratory.  
 Prerequisite: Chemistry 8; Animal Husbandry 101, which may be taken concurrently.  
 Laboratory practice in biochemical procedures with special emphasis on the analysis of urine and blood.
111. **Principles of Pathology and Control of Diseases of Domestic Animals.**  
 (3) II. Mr. Cameron  
 Prerequisite: Bacteriology 1 or 2.  
 The causes, pathology, prevention, and control of animal diseases in relation to economic production and public health.  
 This course meets the requirement of 3 units of parasitology in the Animal Science Curriculum.



112. **Poultry Pathology Laboratory.** (1) II. Mr. Douglas, Mr. Mathey  
Laboratory.

Prerequisite: Zoölogy 1A, Bacteriology 1 or 2 and course 111 (may be taken concurrently); junior standing in poultry husbandry; or consent of the instructor.

Designed to acquaint students majoring in poultry husbandry with the procedures required for identification, prevention, and control of the more prevalent parasites and diseases of poultry in California.



**Veterinary Science 120, 121, 122A-122B, 123A-123B, and 124** are designed for students who have been accepted by the School of Veterinary Medicine; they are open to other students only with the consent of the instructor.

120. **Anatomy of Domestic Animals.** (10) I. Mr. Julian, Mr. Tyler  
Lectures and laboratory.

Prerequisite: open only to students in the School of Veterinary Medicine.  
Lectures, demonstrations and student dissection of domestic animals.

\*121. **Microbiology.** (10) I. Mr. McKercher, Mr. Osebold  
Lectures and laboratory.

Prerequisite: Zoölogy 1A-1B.

122A-122B. **Veterinary Pathology.** (5-5) Yr. Mr. Cordy, Mr. Moulton  
Lectures and laboratory.

Prerequisite: Second-year standing in the School of Veterinary Medicine. Qualified graduate students admitted with consent of instructor.

123A-123B. **Comparative Pharmacology.** (4-4) Yr.

Lectures and laboratory. Mr. Peoples, Mr. Holm

Prerequisite: Second-year standing in School of Veterinary Medicine or permission of instructor.

The action of drugs on the physiological mechanism of domestic animals. Laboratory exercises and demonstrations to illustrate the principles of pharmacology, chemotherapy, and toxicology.

124. **Veterinary Parasitology.** (5) II. Mr. Douglas  
Lectures and laboratory.

The metazoan parasites of domesticated animals with emphasis on biology, life history and control.

125. **Veterinary Genetics.** (2) II. Mr. Stormont  
Lecture and laboratory.

Prerequisite: Genetics 100. (General bacteriology course recommended.)  
Special veterinary aspects of genetics to supplement general genetics.

140. **Mammalian Physiology.** (6) II. Mr. Holm, Mr. Peoples

Prerequisite: Physiology 1 and 1L or Zoölogy 1A-1B; Physics 2A-2B, Chemistry 1A-1B, 8.

A comprehensive survey of mammalian physiology.

140L. **Laboratory in Mammalian Physiology.** (3) II.

Laboratory. Mr. Holm, Mr. Peoples

Prerequisite: course 140 or equivalent (may be taken concurrently).

\* Not to be offered, 1953-1954.

199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Hart in charge)

## GRADUATE COURSES

- 200A-200B. **Research in Animal Pathology.** (1-6; 1-6) Yr. The Staff  
209A-209B. **Seminar in Comparative Pathology.** (1-1) Yr. Mr. Cameron

## VETERINARY MEDICINE

## GRADUATE COURSES

201. **Clinical Pathology.** (4) I. Mr. Schalm, Mr. Jasper  
Lecture and laboratory.  
Prerequisite: Veterinary Science 122A-122B, 123A-123B.  
The practice of laboratory procedures commonly employed as aids to the diagnosis of animal diseases.
202. **Clinical Pathology.** (4) II. Mr. Bankowski, Mr. Schalm  
Lecture and laboratory.  
Prerequisite: course 201.  
Advanced work in the use and interpretation of laboratory diagnostic procedures, including student participation in the routine application of such procedures to cases in the clinic.
203. **Introductory Medicine.** (4) I. Mr. Christensen  
Lectures and laboratory.  
Prerequisite: Veterinary Science 122A-122B, 123A-123B.  
Lectures and demonstrations on history taking, physical diagnosis including comparative examinations on normal and abnormal animals from the clinic.
204. **Infectious Diseases.** (5) II. Mr. Howarth  
Prerequisite: course 203.  
Epidemiology, pathology, and control methods on diseases of livestock, including those diseases important in public health in which domestic livestock are the reservoirs of infection.
205. **Small-Animal Medicine.** (3) II. Mr. Hage  
Prerequisite: courses 203, 235.  
Lectures on the diseases of small animals, covering the symptoms, diagnostic methods, and treatment.
206. **Medicine.** (4) I. Mr. McGowan  
Prerequisite: course 203.  
The diagnosis and control of diseases of domestic livestock.
207. **Medicine.** (4) II. Mr. Rhode  
Prerequisite: course 206.  
The diagnosis and control of diseases of domestic livestock.
208. **Poultry Diseases.** (3) I. Mr. Mathey, Mr. Zander  
The etiology, diagnosis, and control of the diseases of poultry.

220. **Introductory Surgery.** (3) I. Mr. Vetter  
 Prerequisite: Veterinary Science 122A-122B, 123A-123B.  
 Lectures and demonstrations covering general surgical methods with particular emphasis on certain conditions, including wound healing, wound infections, and aseptic surgical techniques.
221. **Surgical Anatomy.** (4) II. Mr. Linton, Mr. Julian  
 Lecture and laboratory.  
 Prerequisite: Veterinary Science 120.  
 Regional anatomy with reference to its application in surgery.
222. **Surgery.** (2) II. Mr. Vetter  
 Laboratory.  
 Prerequisite: course 220.  
 A laboratory course devoted to aseptic operative technique.
223. **Surgery.** (5) I. Mr. Wheat  
 Prerequisite: course 220.  
 Diseases of domestic animals that can be corrected with surgery.
230. **Reproduction.** (4) I. Mr. Kendrick  
 Lectures and laboratory.  
 Prerequisite: Veterinary Science 122A-122B, 123A-123B.  
 An introductory course in the physiology of reproduction, parturition, and obstetrics.
235. **Therapeutics.** (3) I. The Staff (Mr. Rhode in charge)  
 Lectures and laboratory.  
 Prerequisite: Veterinary Science 123A-123B.  
 The application of the principles of pharmacology to the treatment and diagnosis of disease with emphasis on materia medica and prescription writing.
240. **Veterinary Public Health.** (5) II. Mr. Enright, Mr. Sadler  
 Lectures and laboratory.  
 Prerequisite: course 206, or permission of instructor.  
 Meat, milk, and food hygiene. Epidemiologic and public health aspects of diseases of animals transmissible to man.
249. **Extra-Session Clinic.** (3) The Staff (Mr. Christensen in charge)  
 Laboratory.  
 Prerequisite: completion of the first three years of the professional course in Veterinary Medicine.  
 Diagnosis and treatment of diseases and disorders of domestic animals. Work will be done in the clinic during the summer for any continuous period of six weeks.
- 251A-251B. **Clinics.** (5-5) Yr. The Staff (Mr. Christensen in charge)  
 Laboratory.  
 Prerequisite: courses 203 and 220. Course 251A is prerequisite to 251B.  
 Hospital and ambulatory clinical practice.
- 252A-252B. **Autopsy.** (1-1) Yr. Mr. Cordy, Mr. Moulton  
 Laboratory.  
 Prerequisite: course 203. Course 252A is prerequisite to 252B.  
 Practice in autopsy procedure and interpretation of findings.

- 254A-254B. **Clinic Conference.** (No credit) Yr.  
 The Staff (Mr. Jasper in charge)  
 Prerequisite: Veterinary Science 122A-122B, 123A-123B. Course 254A  
 is prerequisite to 254B.  
 A weekly discussion of selected cases from the clinic.
- 256A-256B. **Clinic Conference.** (1-1) Yr.  
 The Staff (Mr. Jasper in charge)  
 Discussion of selected cases from the clinic.
260. **Radiology.** (1) I. Mr. Hage, Mr. Gray  
 Prerequisite: Veterinary Science 120.  
 Principles of radiology applied to the diagnosis and treatment of disease.
- 270A-270B. **Jurisprudence.** (No credit) Yr. The Staff  
 Professional ethics and business law.

## VITICULTURE

(Department Office, 2 Viticulture Building)

- Maynard A. Amerine, Ph.D., *Professor of Enology.*  
 Harold P. Olmo, Ph.D., *Professor of Viticulture.*  
 Albert J. Winkler, Ph.D., *Professor of Viticulture (Chairman of the Department).*  
 James F. Guymon, Ph.D., *Associate Professor of Enology.*  
 John G. B. Castor, Ph.D., *Assistant Professor of Enology.*  
 Albert D. Webb, Ph.D., *Assistant Professor of Enology.*  
 Lloyd A. Lider, Ph.D., *Instructor in Viticulture.*



- Klayton E. Nelson, Ph.D., *Lecturer in Viticulture.*  
 Robert J. Weaver, Ph.D., *Lecturer in Viticulture.*

*Departmental Major Advisers.*—Viticulture, Mr. Olmo; Enology, Mr. Amerine.

*The Majors.*—See page 62 for Viticulture and page 56 for Enology.

### LOWER DIVISION COURSE

1. **Introduction to Grape and Wine Production.** (3) II. Mr. Amerine  
 A survey of the grape and wine industry, including history, distribution, climatic influences, grape varieties, wine types, and economics; with emphasis on the factors influencing quality.  
 Required of all majors in viticulture in the Plant Science Curriculum, as well as of enology majors in the Food Science Curriculum.

### UPPER DIVISION COURSES

105. **Fruit Handling and Varieties.** (3) I. Mr. Lider, Mr. Nelson  
 Lecture and laboratory.  
 Prerequisite: course 1 or Pomology 2.  
 Maturity and standardization; varieties; harvesting table grapes, raisin drying, storage; costs and returns.

116. **General Viticulture.** (4) II. Mr. Winkler, Mr. Weaver  
Lectures and laboratory.  
Prerequisite: course 1 or Pomology 2.  
Plant structure and physiology; principles underlying propagation, pruning, grafting and cultivation; and factors influencing fruit development and quality.
117. **Microbiology of Wine Production.** (4) I. Mr. Castor  
Lectures and laboratory.  
Prerequisite: Bacteriology 1; Chemistry 5, 8.  
Nature, development, physiology, biochemistry and control of yeasts and bacteria involved in the making, aging, and spoilage of wine.
124. **Principles and Practices of Enology: Wine Processing and Analyses.** (4) II. Mr. Amerine  
Lectures and laboratory.  
Prerequisite: course 1; Bacteriology 1; Chemistry 5, 8.  
Introduction to enology: wine types, wine analyses, principles of organoleptic examination, nonbacterial disorders and their control, fining, filtration, and the preparation of vermouths and sparkling wines.
125. **Principles and Practices of Enology: Wine Preparation.** (4) I. Mr. Webb  
Lectures and laboratory.  
Prerequisite: Bacteriology 1, Chemistry 5, 8; course 105, 116.  
The principles and practices of making the various standard types of wine, with special reference to the varieties used, and the method of vinification required for each.
140. **Unit Operations in Winery Practice and Brandy Production.** (4) II. Mr. Guymon  
Lectures and laboratory.  
Prerequisite: Chemistry 5, 8 or 112A. Chemistry 109 is recommended.  
Principles and practices of distillation, evaporation, heat flow, and other winery operations; production, aging, and analyses of brandy.
160. **Proseminar.** (1) I. Mr. Olmo  
Reports and discussions concerning recent advances in viticulture.
199. **Special Study for Advanced Undergraduates in Viticulture.** (1-5) I and II. The Staff (Mr. Winkler in charge)

## RELATED COURSE

**Fruit Breeding (Pomology 114)**

## GRADUATE COURSES

- 200A-200B. **Research in Viticulture and Enology.** (1-6; 1-6) Yr. The Staff (Mr. Winkler in charge)
205. **Seminar.** (1) II. The Staff (Mr. Webb in charge)

**ZOOLOGY**

(Department Office, 249 Animal Science Building)

- Lauren E. Rosenberg, Ph.D., *Professor of Zoölogy (Chairman of the Department).*
- Tracy I. Storer, Ph.D., *Professor of Zoölogy.*
- Milton A. Miller, Ph.D., *Associate Professor of Zoölogy.*

Milton Hildebrand, Ph.D., *Assistant Professor of Zoölogy.*

Everett W. Jameson, Ph.D., *Acting Assistant Professor of Zoölogy.*

George W. Salt, Ph.D., *Instructor in Zoölogy.*



Walter E. Howard, Ph.D., *Lecturer in Zoölogy.*

### PHYSIOLOGY

*Letters and Science List.*—Physiology 1, 1L.

#### LOWER DIVISION COURSES

1. **Introductory Physiology Lecture.** (3) I. Mr. Salt  
Prerequisite: high school chemistry.  
The physiology of muscle, nerve, central nervous system, sensation, circulation, respiration, excretion, and digestion.
- 1L. **Introductory Physiology Laboratory.** (2) I. Mr. Salt  
Laboratory.  
Prerequisite: course 1 completed or in progress.

### ZOOLOGY

*Letters and Science List.*—All undergraduate courses in zoölogy are included in the Letters and Science List of Courses (see pages 79–80).

*Departmental Major Adviser.*—Mr. Miller.

*Preparation for the Major.*—Required: Zoölogy 1A–1B, Chemistry 1A, and Chemistry 1B or 8. Recommended: Elementary German, Elementary French, Geology 1, Physics 2A–2B, 3A–3B, Mathematics 13, Botany 1, Botany 108, Animal Husbandry 110, Genetics 100.

*The Major.*—Required: (1) 24 units of upper division courses in zoölogy (not more than 4 units of Zoölogy 199 may be counted in this requirement). With the approval of the major adviser, 6 units of this requirement may be satisfied by upper division courses in bacteriology, biochemistry, botany, organic chemistry, entomology, genetics, physical chemistry, physiology, and physics. (2) At least a 1.5 average in upper division courses included in the major.

#### LOWER DIVISION COURSES

- 1A. **General Zoölogy.** (4) I. Mr. Miller  
Lectures and laboratory.  
Introduction to the structure, physiology, classification, and interrelations of animals, and the principles of evolution and heredity.
- 1B. **General Zoölogy.** (4) II. Mr. Salt  
Lectures and laboratory.  
Prerequisite: course 1A.  
Structure of the vertebrate body with special reference to the mammal and bird; gross and microscopic anatomy of organs and organ systems.
10. **General Biology.** (3) II. Mr. Jameson  
Not open for credit to students who have had course 1A, but students who have taken course 10 may elect course 1A for credit. Open without prerequisite to all students, but designed for those not specializing in zoölogy.  
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.

## UPPER DIVISION COURSES

- 100A. **Vertebrate Embryology.** (2) I. Mr. Hildebrand  
Prerequisite: course 1B.  
Embryologic development of the vertebrates, including amphibian, chick, and mammal.
- 100C. **Vertebrate Embryology Laboratory.** (2) I. Mr. Hildebrand  
Laboratory.  
Prerequisite: course 100A, which should be taken concurrently.
104. **Materials and Methods of Animal Micrology.** (3) I. Mr. Rosenberg  
Lecture and laboratory.  
Prerequisite: course 1B. (Limited enrollment.)  
History, theory, and application of methods for microscopic work in the animal sciences.
106. **Comparative Anatomy of the Vertebrates.** (4) II. Mr. Hildebrand  
Lectures and laboratory.  
Prerequisite: course 1B. Courses 100A-100C are recommended.  
Evolution and adaptations of organ systems and phylogeny of the major vertebrate groups.
107. **Microanatomy.** (4) I. Mr. Rosenberg  
Lectures and laboratory.  
Prerequisite: course 1B.  
The finer structure and activities of organs, tissues, and cells of vertebrates, with emphasis on those of mammals.
110. **Protozoölogy.** (4) II. Mr. Rosenberg  
Lectures and laboratory.  
Prerequisite: course 1A and junior standing.  
Structure, life history, and ecology of the groups of protozoa with emphasis on relationships to biological problems.  
Minimum enrollment of 5 students.
112. **Invertebrate Zoölogy.** (4) II. Mr. Miller  
Lectures and laboratory.  
Prerequisite: course 1A and junior standing.  
Anatomy, classification and natural history of representative invertebrate animals, excluding protozoans and insects.
116. **Economic Vertebrate Zoölogy.** (3) I. Mr. Storer, Mr. Jameson  
Lectures and laboratory.  
Prerequisite: course 1A and junior standing.  
Relation of vertebrate animals to human affairs; effect of settlement, forestry, agriculture, and hunting on wild populations; attention to rodents, deer, carnivorous mammals and birds, fur production, game birds, food and game fisheries; principles and agencies of management and conservation.  
Minimum enrollment of 5 students.
125. **Animal Ecology.** (3) II. Mr. Howard  
Prerequisite: upper division standing in one of the biological sciences.  
Study of animal communities; with emphasis on vertebrates and their environment.

- \*133. **Biology of the Cold-Blooded Vertebrates.** (4) II.      Mr. Storer, Mr. Jameson  
Lectures and laboratory.  
Prerequisite: course 1B.  
Fishes, amphibians and reptiles; identification and classification; ecologic and geographic distribution; field study of habits and life histories; emphasis on species in California and western North America.  
Offered in spring semester of odd-numbered years.
134. **Biology of Birds and Mammals.** (4) II.      Mr. Storer, Mr. Salt  
Lectures and laboratory; including field trips; also two or three week-end trips.  
Prerequisite: course 1B.  
Identification, ecologic and geographic distribution; field study of habits and life histories; emphasis on species in California and western North America.  
Offered in spring semester of even-numbered years.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II.  
The Staff (Mr. Rosenberg in charge)

## GRADUATE COURSES

- 200A-200B. **Research in Zoölogy.** (1-6; 1-6) Yr.  
The Staff (Mr. Rosenberg in charge)
201. **Zoölogy Seminar.** (1) I and II.      The Staff (Mr. Jameson in charge)

\* Not to be given, 1953-1954.



## TWO-YEAR CURRICULA

### COURSES OF INSTRUCTION

#### EXPLANATION OF TERMS USED

*Classification and Numbering.*—Courses numbered 50–99 are designed to meet the special needs of students enrolled in the Two-Year Curricula on the Davis campus.

*Abbreviations.*—The credit value of each course in units is indicated by a number in parentheses after the title. Varying units may be indicated for courses numbered 90, since the student is permitted to select the amount of work to be undertaken. The session in which the course is given is shown by the roman numeral I for the fall semester and II for the spring semester.

*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

(Department Office, 7 Temporary Building No. 2)

Edwin C. Voorhies, B.S., *Professor of Agricultural Economics (Vice-Chairman of the Department).*



Russell T. Robinson, B.S., *Lecturer in Agricultural Economics.*

51. **Marketing Agricultural Products.** (3) I. Mr. Robinson  
Problems, types of marketing agencies, major marketing functions, marketing costs and margins, factors affecting prices of farm products, speculation, commodity exchanges and hedging, group or coöperative marketing, market control, market efficiency, role of government in marketing. Special emphasis on California products and marketing problems.
54. **Farm Management.** (3) II. Mr. Robinson  
Lectures and laboratory.  
Prerequisite: course 55 or consent of the instructor.  
Economic factors affecting location of farm enterprises; choice and combination of enterprises; the calendar of operations; efficient use of labor, machinery, and land; production costs; analyzing the farm business; reorganizing the farm and testing for efficiency; choice of farms, location, appraisal; profit and loss statements and measures of efficiency.
55. **Farm Bookkeeping.** (3) I. Mr. Robinson  
Lectures and laboratory.  
Prerequisite: Mathematics 50, which may be taken concurrently.  
Essentials of farm bookkeeping, types of records and their functions; use of cashbooks, journals, and ledgers; recording noncash items, inventories, depreciation and special records; analysis of records, profit and loss statements; use of double-entry systems; enterprise accounting; income tax records and returns.

**AGRICULTURAL ENGINEERING**

(Department Office, 206 Agricultural Engineering Building)

Roy Bainer, M.S., *Professor of Agricultural Engineering (Chairman of the Department)*.Lloyd H. Lamouria, M.S., *Instructor in Agricultural Engineering*.Philip R. Bunnelle, M.S., *Lecturer in Agricultural Engineering*.Samuel A. Hart, Ph.D., *Lecturer in Agricultural Engineering*.Harold D. Lewis, B.S., *Associate in Agricultural Engineering*.Allan A. McKillop, M.S., *Lecturer in Agricultural Engineering*.**50. Farm Mechanics. (3) I and II.**

Mr. Lewis

Lectures and laboratory.

Forging; soldering; plumbing; sheetmetal work; electric and acetylene welding and cutting; tool conditioning; selection of shop tools and equipment; shop layouts.

**51. Drawing. (2) I.**

Mr. Hart

Lecture and laboratory.

Mechanical and detail drawing including orthographic plans, isometric, oblique, and perspective developments; freehand sketching; contour and section mapping; graphical presentation; care and use of drawing instruments.

**52. Farm Structures. (3) II.**

Mr. Hart

Lectures and laboratory.

Prerequisite: Mathematics 50.

Planning of farm structures; requirements for production and storage structures; selection of materials; estimating of materials and costs; principles of framing; concrete work; painting.

**54. Farm Machinery. (3) II.**

Mr. Bunnelle

Lectures and laboratory.

Prerequisite: Mathematics 50.

Principles, construction, operation, adjustment, performance, power requirements, and selection of tillage, seeding, harvesting, and pest-control machinery; construction and testing of displacement, and centrifugal pumps and domestic water systems. Practical problems are regularly assigned to emphasize the lecture and laboratory work.

**55. Farm Power. (3) I.**

Mr. Lamouria

Lectures and laboratory.

Prerequisite: Mathematics 50.

Principles, construction, operation, adjustment, and maintenance of various types of internal combustion engines, tractors, and electric motors; field operation of tractors. Regular problem assignments are made to supplement the class work.

**57. Dairy Equipment. (3) I.**

Mr. McKillop

Lectures and laboratory.

Prerequisite: Mathematics 50.

Principles of steam generation and use, electricity, hydraulics, refrigeration.

*Agricultural Engineering; Agronomy; Animal Husbandry* 191

tion, and air conditioning with their application to agriculture. Laboratory exercises include study, operation, maintenance, and testing of typical equipment.

**AGRONOMY**

(Department Office, 131 Hunt Hall)

Maurice L. Peterson, Ph.D., *Associate Professor of Agronomy (Chairman of the Department)*.

Francis L. Smith, Ph.D., *Associate Professor of Agronomy*.

Paulden F. Knowles, Ph.D., *Assistant Professor of Agronomy*.

Charles W. Schaller, Ph.D., *Assistant Professor of Agronomy*.

William A. Williams, Ph.D., *Instructor in Agronomy*.



David Ririe, Ph.D., *Lecturer in Agronomy*.

Dorman C. Sumner, B.S., *Lecturer in Agronomy*.

**51. Introduction to Agronomy. (3) I.**

Mr. Smith

The principles and practices of field-crop production and soil management. The subjects considered will include the relation of crop production to environment, climate, soil, rotation, fertilization, irrigation, land preparation, seeding, tillage and harvesting.

**52. Cereals. (3) II.**

Mr. Schaller

Lectures and laboratory.

Classification, production, and use of the small grains, corn, and sorghum. Discussion of the factors determining quality and market classes; commercial grading and seed processing.

**53. Cotton, Sugar Beets, and Miscellaneous Crops. (3) I.**

Lectures and laboratory.

Mr. Knowles, Mr. Ririe

Adaptation, production, and use of such field crops as beans, fiber, sugar, and oil crops.

**54. Forage Crops. (3) II.**

Mr. Sumner

Lectures and laboratory.

Adaptation, production, and use of forage crops for hay, range, irrigated pasture and silage; identification of forage plants and seeds, determination of seed quality, and hay grading. Field trips to irrigated pastures and improved range will be arranged.

**ANIMAL HUSBANDRY**

(Department Office, 128 Animal Science Building)

Harold H. Cole, Ph.D., *Professor of Animal Husbandry (Chairman of the Department)*.

Paul W. Gregory, Sc.D., *Professor of Animal Husbandry*.

Carroll E. Howell, M.S., *Professor of Animal Husbandry*.

James F. Wilson, M.A., LL.D., *Professor of Animal Husbandry*.

Floyd D. Carroll, Ph.D., *Assistant Professor of Animal Husbandry*.

Perry T. Cupps, *Assistant Professor of Animal Husbandry*.

Hubert Heitman, Jr., Ph.D., *Assistant Professor of Animal Husbandry.*  
 Robert C. Laben, Ph.D., *Assistant Professor of Animal Husbandry.*  
 Glen P. Lofgreen, Ph.D., *Assistant Professor of Animal Husbandry.*  
 James H. Meyer, Ph.D., *Assistant Professor of Animal Husbandry.*  
 Wade C. Rollins, Ph.D., *Assistant Professor of Animal Husbandry.*  
 William C. Weir, Ph.D., *Assistant Professor of Animal Husbandry.*

51. **Principles of Animal Husbandry.** (4) I. Mr. Rollins  
 Lectures and laboratory.  
 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. Lofgreen  
 Composition and use of feedstuffs.
54. **Animal Breeding.** (3) II. Mr. Gregory  
 Introduction to genetics and a discussion of the laws of heredity as they apply to the problems of animal production.
56. **Horse Production.** (2) II. Mr. Howell  
 Lecture and laboratory.  
 Prerequisite: course 52.  
 Breeding, feeding, and management of horses.
58. **Milk Production.** (2) II. Mr. Laben, Mr. Cupps  
 Lecture and laboratory.  
 Prerequisite: course 52.  
 Breeding, feeding, and management of dairy cattle.
61. **Swine Production.** (2) I. Mr. Meyer, Mr. Heitman  
 Lecture and laboratory.  
 Prerequisite: course 52.  
 Selection, breeding, feeding, and management of hogs.
63. **Beef-Cattle Production.** (2) I. Mr. Carroll  
 Lecture and laboratory.  
 Prerequisite: course 52.  
 Selection, breeding, feeding, and management of beef cattle.
65. **Sheep Production.** (2) I. Mr. Weir, Mr. Wilson  
 Lecture and laboratory.  
 Prerequisite: course 52.  
 Selection, breeding, feeding, and management of sheep.

### BACTERIOLOGY

(Department Office, 1076C Veterinary Science Building)

Courtland S. Mudge, Ph.D., *Professor of Bacteriology (Chairman of the Department).*

61. **Elementary Bacteriology.** (2) I. Mr. Mudge  
 Prerequisite: Chemistry 51 and Mathematics 50.  
 Fundamental principles of bacteriology and microbiology. Applications to such fields as soils, sanitation, food technology, and animal and plant disease.

**BOTANY**

(Department Office, 2 Botany Building)

Vernon I. Cheadle, Ph.D., *Professor of Botany (Chairman of the Department)*.  
 Alden S. Crafts, Ph.D., *Professor of Botany*.

**50. Elementary Botany.** (3) I and II.

Mr. Cheadle

Principles underlying the structure, nutrition, growth, reproduction, and classification of plants. Special emphasis on plants of orchard, garden, and field. Basic information for students majoring in the plant-production curricula. A practical course employing laboratory demonstrations and lectures.

**51. Weed Control.** (3) I.

Mr. Crafts

Lectures and laboratory.

Prerequisite: course 50, or equivalent, and consent of the instructor.

Weed characteristics and identification; principles of weed control including tillage, selective and nonselective chemical weed killers, soil sterilants, and machinery and equipment; analysis of special weed problems; laws and regulations.

**CHEMISTRY**

(Department Office, 31 Chemistry Building)

Harold G. Reiber, Ph.D., *Professor of Chemistry (Chairman of the Department)*.

**51. Elementary Chemistry.** (3) I.

The Staff

**DAIRY INDUSTRY**

(Department Office, 209 Dairy Industry Building)

\*Eugene L. Jack, Ph.D., *Professor of Dairy Industry (Chairman of the Department)*.

Thomas A. Nickerson, Ph.D., *Assistant Professor of Dairy Industry*.



Bruce E. Hubbell, Jr., B.S., *Lecturer in Dairy Industry*.

Clement A. Phillips, M.S., *Lecturer in Dairy Industry*.

**50. Elements of Dairying.** (3) I.

Lectures and laboratory.

The principles of dairying, including Babcock testing and analysis of milk and its products, the composition, properties, care, and handling of milk, and a brief survey of market milk, butter, cheese, ice cream, condensed milk, and powdered milk processes.

**51. Cheesemaking.** (3) I.

Mr. Phillips

Lecture and laboratory.

Prerequisite: course 50, which may be taken concurrently.

A study of milk quality and pasteurization of milk as related to quality of cheese, preparation and care of starters, the principles in the manufacture of casein, cottage cheese, cream cheese, cheddar, Monterey, granular, and brick cheese; processed cheese, cheese spreads, including causes and remedies of the various defects commonly found in market cheese.

\* Absent on leave, July to December 31, 1958.

52. **Buttermaking.** (3) II. Mr. Nickerson  
Lectures and laboratory.  
Prerequisite: course 50.  
Problems involved in the procurement of raw material; principles; procedures and equipment used in pasteurization, churning, packaging; efficient methods of creamery operation; quality and defects of creamery butter.
53. **Ice-Cream Making.** (3) I. Mr. Hubbell  
Lectures and laboratory.  
Prerequisite: course 50; Agricultural Engineering 57, which may be taken concurrently.  
The calculation, pasteurization, and processing of ice-cream and ice-milk mixes. Operation of continuous, batch, and counter freezers in making ice cream, ice milk and sherbets, and the hardening and storing of these products. The causes and prevention of ice-cream defects.
54. **Market Milk.** (3) II. Mr. Phillips  
Lectures and laboratory.  
The operation of the market milk industry including conditions affecting quality of milk utilized for city supply; sanitary production, transportation, pasteurization, distribution, and inspection of milk and related products; a study of city milk ordinances and state dairy inspection regulations.
60. **Creamery Practice.** (3) I and II. Mr. Hubbell  
Lecture and laboratory.  
Prerequisite: course 50 or 54, which may be taken concurrently.  
Practice in processing dairy products and in the operation of the equipment used in the manufacture of cheese, butter, market milk, ice cream, condensed and powdered milk. Operation of refrigeration equipment and plant maintenance.  
This course, with the consent of the instructor, may be repeated once for credit.
62. **Dairy Plant Management.** (3) II. Mr. Hubbell  
Lectures and laboratory.  
Prerequisite: courses 50 and 60.  
Problems involved in the organization, management, and operation of dairy plants. The keeping of records, merchandising, advertising, personnel management, and procurement of raw products as it pertains to dairy plants. Practice in plant layout and arrangement for efficient handling of products and use of labor.

### EDUCATION

(Department Office, 8 Temporary Building No. 6)

Sidney S. Sutherland, M.S., *Assistant Professor of Education (Chairman of the Department)*.



Frederick L. Griffin, M.S., *Professor of Agricultural Education*.

90. **Special Problems.** (1-5) I and II. Mr. Griffin  
Prerequisite: consent of the instructor.  
Individual study opportunities for qualified students.

**ENGLISH, DRAMATIC ARTS, AND SPEECH**

(Department Office, 2 and 3 Temporary Building No. 1)

Celeste T. Wright, Ph.D., *Professor of English (Chairman of the Department)*.Susan F. Regan, M.A., *Lecturer in English*.**ENGLISH**50. **Business Writing.** (3) I and II.

The Staff

Practice in business correspondence: selling and ordering goods, extending credit and collecting accounts, making adjustments, applying for positions. Study of grammar, spelling, punctuation, sentence construction.

90. **Special Problems.** (1-3) I and II. The Staff (Mrs. Wright in charge)

Prerequisite: course 50 or Subject A, and consent of the instructor.

Individual work in literature or composition for advanced students.

**SPEECH**55. **Oral English for Foreign Students.** (4) I and II.

Mrs. Regan

For foreign students only. Pronunciation, speaking, grammar, reading, and writing of English. Required of those who do not pass the Examination in English and who are not qualified to take course 56.

56. **Oral English for Foreign Students.** (4) I and II.

Mrs. Regan

For foreign students only. Required of those who need further instruction in English, but whose level of proficiency is higher than that expected in course 55.

**ENOLOGY—(See Viticulture)****ENTOMOLOGY AND PARASITOLOGY**

(Department Office, 2 Entomology Building)

Stanley F. Bailey, Ph.D., *Professor of Entomology (Vice-Chairman of the Department)*.John E. Eckert, Ph.D., *Professor of Entomology*.William H. Lange, Jr., Ph.D., *Associate Professor of Entomology*.**ENTOMOLOGY**51. **Agricultural Entomology.** (3) I.

Mr. Lange

Lectures and laboratory.

Identification, life histories, habits, and control of injurious insects, particularly those affecting agricultural crops. Supervised field excursions will include collection of insects and observations of damage and control.

52. **Beekeeping.** (3) II.

Mr. Eckert

Lectures and laboratory.

The fundamentals of beekeeping are taught from the viewpoint of the beginner and include a study of the anatomy, life history, and habits of the honeybee; practice in the handling of bees; production and characteristics of honey; use of bees in pollination; a study of modern beekeeping equipment and methods.

**90. Special Problems.** (2-6) I and II. The Staff (Mr. Bailey in charge)

Prerequisite: consent of the instructor.

Special problems in beekeeping for advanced students and for those who have had prior experience in beekeeping, including the rearing of queens and package bees, disease control and apiary inspection, toxicity of various insecticides to beekeeping. Also, for selected students interested in quarantine and regulatory work, special problems are offered covering various aspects of the quarantined insects, as well as survey, inspection, and eradication procedures.

**HISTORY AND POLITICAL SCIENCE**

(Department Office, 13 Temporary Building No. 1)

Carl B. O'Brien, Ph.D., *Assistant Professor of History (Chairman of the Department)*.

W. Sheridan Warrick, M.A., *Acting Instructor in History*.

**HISTORY****57A-57B. History and Institutions of the United States.** (3-3) Yr.

Course 57A is not prerequisite to course 57B. Mr. Warrick

57A. American national beginnings from colonial times through 1865.

57B. The American nation from the Civil War to the present.

The completion of *either* course 57A or 57B will satisfy the graduation requirement of American History and Institutions of the Two-Year Curricula.

**HORTICULTURE—(See Pomology, Vegetable Crops, and Viticulture)****IRRIGATION**

(Department Office, 119 Soils and Irrigation Building)

Frank J. Veihmeyer, C.E., Ph.D., *Professor of Irrigation (Chairman of the Department)*.

Robert H. Burgy, M.S., *Assistant Professor of Irrigation*.



James C. Marr, B.S., *Lecturer in Irrigation*.

**51. Plane Surveying.** (3) I.

Mr. Burgy

Lectures and laboratory.

Prerequisite: plane trigonometry and consent of the instructor.

Principles; field practice; calculations and mapping with special reference to irrigation, drainage, and agricultural engineering problems.

**53. Irrigation Practice.** (3) I.

Mr. Marr

Lectures and laboratory.

Prerequisite: Mathematics 50.

Soil moisture in relation to irrigation practice; water requirements of crops; preparation of land; design of ditches and pipe lines; measurements of water; development of water supplies; selection and operation of pumping plants; and drainage and reclamation.



**LANDSCAPE MANAGEMENT**

(Department Office, 3 Landscape Management-Music Building)

Robert B. Deering, Ph.D., *Assistant Professor of Landscape Management (Chairman of the Department)*.Robert J. Tetlow, M.S., *Instructor in Landscape Management*.———, *Instructor in Landscape Management*.

51. **General Landscape Management.** (4) I. Mr. Tetlow  
Lectures and laboratory.  
Landscapeing the small property; the arrangement of walks and drives; plant forms and their use in design; ground covers, lawns, and maintenance problems.
52. **Plant Materials.** (2) II. Mr. Tetlow  
Lecture and laboratory.  
Prerequisite: course 51.  
Identification of ornamental trees and shrubs; the study of plant forms and growth habits, and their use in design.
53. **Nursery Practice.** (3) I. ———  
Lectures and laboratory.  
Prerequisite: course 52.  
Propagation and care of ornamental plants in seed beds, cold frames, lath-houses and nursery; lining out and planting nursery stock; seed collection, propagation, and nursery care; digging, balling, canning, assembling, and packing nursery stock; nursery sales; field trips to nurseries.

**MATHEMATICS**

(Department Office, 161 Home Economics Building)

Edward B. Roessler, Ph.D., *Professor of Mathematics (Chairman of the Department)*.

50. **Elementary Mathematics.** (3) I and II. The Staff  
Review of the principles of arithmetic, elements of algebra, ratio and proportion, percentage with applications to agriculture, mensuration, building construction, farm mechanics, and an introduction to the mathematics of finance.

**MILITARY SCIENCE AND TACTICS**

(Department Office, 125 Gymnasium)

John T. Batts, Major, Infantry, *Professor of Military Science and Tactics (Chairman of the Department)*.

- 51A. **Basic (First Year).** (2) I. The Staff  
Lectures and drill.  
Required of all physically fit male students unless specific exemption is granted.  
Military policy of the United States; military organization; evolution of warfare; weapons and marksmanship; leadership, drill, and exercise of command.

- 51B. Basic (First Year). (2) II.** The Staff  
Lectures and drill.  
Required of all physically fit male students unless specific exemption is granted.  
Maps and aerial photographs; first aid and hygiene; military problems of the United States; leadership, drill, and exercise of command.
- 52A. Basic (Infantry)—Second Year. (2) I.** The Staff  
Lectures and drill.  
Prerequisite: course 51A and 51B, or their equivalents.  
Required of all physically fit male students unless specific exemption is granted.  
Military organization; individual and crew-served weapons; marksmanship; leadership, drill, and exercise of command.
- 52B. Basic (Infantry)—Second Year. (2) II.** The Staff  
Lectures and drill.  
Prerequisite: course 52A or equivalent.  
Required of all physically fit male students unless specific exemption is granted.  
Individual and crew-served weapons; technique of fire of the rifle squad; combat formations; scouting and patrolling; tactics of the rifle squad; leadership, drill, and exercise of command.
- 60A. Advanced Infantry (First Year). (4) I.** The Staff  
Lectures and drill. Field trips to be arranged.  
For selected students who have completed the basic courses or their equivalents.  
Military organization; crew-served weapons; gunnery; leadership, drill, and exercise of command.
- 60B. Advanced Infantry (First Year). (4) II.** The Staff  
Lectures and drill. Field trips to be arranged.  
Prerequisite: course 60A.  
Field fortifications; communications; gunnery, combat intelligence; estimate of the situation and combat orders; tactics of rifle and heavy weapons platoons and companies; leadership, drill, and exercise of command.
- 90A. Advanced Infantry (Second Year). (4) I.** The Staff  
Lectures and drill. Field trips to be arranged.  
Prerequisite: course 60A and 60B.  
Military administration, military teaching methods; military organization; communications; motors and transportation; troop movements; new developments; geographical foundations of national power; leadership, drill, and exercise of command.
- 90B. Advanced Infantry (Second Year). (4) II.** The Staff  
Lectures and drill. Field trips to be arranged.  
Prerequisite: course 90A.  
Military law and boards; supply and evacuation; new developments; the military team; tactics of the infantry battalion in attack and defense; command and staff; psychological warfare; leadership, drill, and exercise of command.

**MUSIC**

(See "Philosophy and Fine Arts" below)

**PHILOSOPHY AND FINE ARTS**

(Department Office, 3 Physics Building)

Arthur H. Child, Ph.D., *Associate Professor of Philosophy (Chairman of the Department)*.Jerome W. Rosen, M.A., *Instructor in Music*.\_\_\_\_\_, *Instructor in Music*.**MUSIC**

52. **University Concert Band.** (2) II. Mr. Rosen  
Two hour-and-a-half rehearsals and one section hour per week.  
Open to any student in the University whose technical proficiency meets the requirements of concert performance.  
Rehearsal and performance of band music. May be repeated once without duplication of credit.  
In the fall semester, band practice and performance will be offered as an activity, rather than a course, with one two-hour rehearsal per week.
- 57A-57B. **Introduction to Musical Literature.** (2-2) Yr. \_\_\_\_\_  
Course 57A is not prerequisite to 57B.  
Lectures, illustrations, and readings designed to furnish a general appreciation of music. Intended primarily for students whose major is not music.
60. **University Chorus.** (2) I and II. \_\_\_\_\_  
Two hour-and-a-half rehearsals and one section hour per week.  
Rehearsal and performance of choral music. May be repeated once without duplication of credit.
70. **University Symphony Orchestra.** (2) I and II. Mr. Rosen  
Two hour-and-a-half rehearsals and one section hour per week.  
Open to any student in the University whose technical proficiency meets the requirements of concert performance.  
Rehearsal and performance of symphonic music. May be repeated once without duplication of credit.

**PHYSICAL EDUCATION**

(Department Office, 204 Gymnasium)

Irving F. Toomey, B.S., *Supervisor of Physical Education (Chairman of the Department)*.Vernard B. Hickey, A.B., *Associate Supervisor of Physical Education*.George A. Stromgren, M.S., *Associate Supervisor of Physical Education*.Eugene S. Wilson, B.S., *Associate Supervisor of Physical Education*.Theodore W. Forbes, M.S., *Assistant Supervisor of Physical Education*.Willard S. Lotter, A.B., *Assistant Supervisor of Physical Education*.Myron R. Schall, A.B., *Assistant Supervisor of Physical Education*.Marya Welch, Ed.D., *Assistant Supervisor of Physical Education*.

The incidental fee, payable by all students at the time of registration, entitles students to the use of the gymnasium, swimming pool, showers, towels, lockers, tennis courts, and the athletic fields. Equipment for games and sports

is available for exercise and recreation, either with or without instruction. Courses may be elected with or without academic credit.

Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulations of the department.

**50. Physical Education for Men. (3) I and II.**

Mr. Toomey, Mr. Forbes, Mr. Hickey, Mr. Schall,  
Mr. Stromgren, Mr. Wilson

Sections meet twice weekly at various hours.

Sections are organized in baseball, basketball, boxing, football, golf, riding, soccer, tennis, touch football, track, wrestling, swimming, lifesaving, and water sports. Men qualified for athletics may enroll in any sport pursued at Davis, such as football and basketball, and receive credit for this elective.

This course may be repeated for credit not to exceed a total of two units.

**55A. First Aid. (1) I and II.** Mr. Hickey, Mr. Wilson, Mr. Stromgren  
Standard course. Upon successful completion of the course, the Red Cross Certificate is awarded.

**55B. Advanced First Aid. (No credit) I.**

Mr. Hickey, Mr. Wilson, Mr. Stromgren

Sections meet two hours weekly for eight weeks.

Prerequisite: course 55A.

Upon successful completion of the course, the Red Cross Certificate is awarded.

**60. Physical Education for Women. (3) I and II.** Miss Welch

Sections meet twice weekly at various hours.

Sections are organized in archery, badminton, tennis, volleyball, riding, swimming, lifesaving, and swimming formations.

This course may be repeated for credit not to exceed a total of two units.

**74. Theory of Teaching of Swimming, Diving, and Water Polo. (1) I and II**  
Lecture and laboratory. Mr. Hickey

Prerequisite: course 50 in swimming, or the equivalent.

Skills and teaching techniques.

**75. The Theory and Teaching of Lifesaving and Water Safety.**

(1) I and II.

Mr. Hickey

Lecture and laboratory.

Prerequisite: course 74, or the equivalent, and Red Cross Life Saving Certificate.

Upon successful completion of the course, the Red Cross Instructor's Certificate is awarded.

## PLANT PATHOLOGY

(Department Office, 258 Hunt Hall)

James B. Kendrick, Sr., Ph.D., *Professor of Plant Pathology (Vice-Chairman of the Department).*

———, *Associate Professor of Plant Pathology.*

**52. Plant Diseases. (3) II.** The Staff (——— in charge)

Lectures and laboratory.

Prerequisite: Botany 50.

A study of the most important plant diseases affecting the principal field, vegetable, fruit, and nut crops grown in California. Emphasis is placed on recognition and control of these diseases.

**POMOLOGY**

(Department Office, 201 Horticulture Building)

Lawrence L. Claypool, Ph.D., *Professor of Pomology.*Warren P. Tufts, Ph.D., *Professor of Pomology (Chairman of the Department).*Richard W. Harris, Ph.D., *Assistant Professor of Pomology.*Dale E. Kester, Ph.D., *Instructor in Pomology.*Eugene F. Serr, Jr., B.S., *Lecturer in Pomology.***51. Fruit Growing. (3) I.**

Mr. Harris

Prerequisite: Botany 50, which may be taken concurrently.

Principles of fruit growing, with special reference to California conditions. The subjects considered will include pruning, propagation, rootstocks, varieties, pollination, fruit thinning, orchard soil management, disease and insect control, and effect of climate.

**52. Plant Propagation. (2) II.**

Mr. Kester

Lecture and laboratory.

Prerequisite: Botany 50.

Principles and methods of propagation with special emphasis on fruit plants. Practice in grafting, budding, layering, and making of cuttings.

**53. Orchard Operations. (2) I.**

Mr. Serr

Lecture and laboratory.

Prerequisite: course 51, which may be taken concurrently.

Lectures on nut crops, pome fruits, small fruits, and pruning. Laboratory studies of fruit species, pear packing, walnut harvesting, varieties of nuts and fruits, fruit-bud differentiation and fruit-bearing habits, and pruning.

**54. Orchard Operations. (2) II.**

Mr. Harris

Lecture and laboratory.

Prerequisite: course 53, or consent of instructor.

Lectures on production and handling of peaches, apricots, plums, prunes, cherries, figs, and persimmons. Laboratory studies of orchard planting, spraying, frost protection, tree wiring, rootstocks, pollination, fruit thinning, nutritional deficiencies, and orchard management.

**59. Citrus and Other Subtropical Fruits. (3) I.**

Mr. Claypool

Prerequisite: course 51.

The production of the evergreen subtropical fruits including avocados, dates, and olives, with special emphasis on citrus. A study of the fundamental information relating to orchard management as applied to these fruits.

**POULTRY HUSBANDRY**

(Department Office, Poultry Building)

Vigfus S. Asmundson, Ph.D., *Professor of Poultry Husbandry.*George F. Stewart, Ph.D., *Professor of Poultry Husbandry (Chairman of the Department).*Frank H. Kratzer, Ph.D., *Associate Professor of Poultry Husbandry.*Frederick W. Lorenz, Ph.D., *Associate Professor of Poultry Husbandry.*Arthur H. Smith, Ph.D., *Assistant Professor of Poultry Husbandry.*Wilbor O. Wilson, Ph.D., *Assistant Professor of Poultry Husbandry.*

51. **Introduction to Poultry Husbandry.** (4) I. Mr. Wilson  
Lectures and laboratory.

A study of poultry husbandry and flock management. Laboratory exercises include culling, housing, management, and marketing practices.

53. **Incubation and Brooding Practice.** (3) I. Mr. Smith  
Conference hour and practice daily, including Sunday, for nine weeks, 7:30-8 A.M., 12 M. to 12:15 P.M., 4-5 P.M.

Prerequisite: course 51, which may be taken concurrently, and consent of the instructor.

This course is designed to give students practical experience in the operation of incubators and brooders. The students keep detailed records of their incubation and brooding operations.

55. **Utility Poultry Breeding.** (2) I. Mr. Asmundson  
Prerequisite: course 51, which may be taken concurrently.

A review of what is known about the inheritance of economically important characteristics and the application of this knowledge to breeding poultry. Given in the fall semesters of even-numbered years.

56. **Turkey Production.** (2) II. Mr. Asmundson  
Prerequisite: course 51.

A review of present knowledge concerning inheritance in turkeys; selection of breeding stock; setting up breeding programs; care of hatching eggs and incubation; brooding and rearing; sanitation; nutrition and feeding; marketing.

Given in the spring semesters of even-numbered years.

57. **Poultry Nutrition.** (2) I. Mr. Kratzer  
Prerequisite: course 51 and Chemistry 51.

Principles of poultry nutrition; symptoms of deficiencies; specific nutritive requirements of poultry; composition of feedstuffs and the formulation of rations to meet the requirements for growth, egg production, reproduction, and fattening.

Given in the fall semesters of odd-numbered years.

59. **Market Eggs and Poultry.** (2) II. Mr. Lorenz, Mr. Stewart  
Lecture and laboratory.

Prerequisite: course 51.

Half of the course deals with recognition of egg quality factors and the preservation of egg quality by proper handling. The second half of the course takes up the preparation of poultry for market.

Given in the spring semesters of odd-numbered years.

*Poultry Husbandry; Soils; Vegetable Crops*

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90. **Special Problems.** (1-2) I and II. The Staff (Mr. Stewart in charge)

Prerequisite: course 51, which may be taken concurrently, and consent of the instructor.

**SOILS**

(Department Office, 241 Soils and Irrigation Building)

Lannes E. Davis, Ph.D., *Associate Professor of Soils (Vice-Chairman of the Department)*.Arthur L. Brown, Ph.D., *Lecturer in Soils*.**SOIL SCIENCE**52. **Soils.** (3) II.

Mr. Brown

Lectures and laboratory.

This is a survey course. The natural origin of soils, the properties of soils, and soil moisture are discussed. Special soil problems, for example, those concerned with alkali and acid soils are emphasized. The early part of the course is presented as a background to the broad problem of soil management, which is treated in the final group of studies. Soil management involves fertilization, tillage, growth of cover crops, use of green manures, and erosion control.

**SPEECH**

(See English, Dramatic Arts, and Speech, page 195)

**VEGETABLE CROPS**

(Department Office, 152 Hunt Hall)

James E. Knott, Ph.D., Sc.D. (hon.c.), *Professor of Vegetable Crops (Chairman of the Department)*.Glen N. Davis, Ph.D., *Associate Professor of Vegetable Crops*.Paul G. Smith, Ph.D., *Associate Professor of Vegetable Crops*.James E. Welch, Ph.D., *Lecturer in Vegetable Crops*.52. **Vegetable Crops.** (3) II.

Mr. Knott

Lectures and laboratory.

The principles and practices of vegetable-crop production. A survey of the vegetable industry. Varieties, adaptation to climate and soil, cropping systems, land preparation, fertilization, culture, harvesting, marketing, and grading.

53. **Vegetable Varieties.** (3) I.

Mr. Welch, Mr. Smith

Laboratory and discussion period.

Prerequisite: course 52.

The identification, classification, and origin of vegetable crops. Study of the history, uses, advantages, and limitations of the principal California and U. S. vegetable varieties. One or more field trips will be made.

**54. Vegetable Improvement. (3) II.**

Mr. Davis

Lectures and laboratory.

Prerequisite: Botany 50, and course 52, or Agronomy 51, or Landscape Management 51, or Pomology 51.

The principles of heredity as applied to vegetable improvement. Methods and techniques of hybridization, selection, maintenance, and improvement of vegetable varieties. Production, harvesting, and storage of vegetable seeds.

**90. Special Problems. (2-4) I and II.** The Staff (Mr. Knott in charge)

Prerequisite: consent of the instructor.

**VETERINARY SCIENCE**

(Department Office, 1018 Veterinary Science Building)

Hugh S. Cameron, D.V.M., Ph.D., *Professor of Veterinary Science.*George H. Hart, V.M.D., M.D., *Professor of Veterinary Science (Chairman of the Department).***51. Animal Hygiene. (2) I.**

Mr. Cameron

Prerequisite: Zoölogy 51.

The general principles of disease control. The various causes of disease are discussed with relation to methods of prevention. Emphasis is placed on the maintenance of the health of the herd or flock rather than on major treatment or surgery of sick animals. Specific epidemics of economic importance to domestic livestock production are also discussed.

**VITICULTURE**

(Department Office, 2 Viticulture Building)

Maynard A. Amerine, Ph.D., *Professor of Enology.*Harold P. Olmo, Ph.D., *Professor of Viticulture.*Harold J. Winkler, Ph.D., *Professor of Viticulture (Chairman of the Department).*James F. Guymon, Ph.D., *Associate Professor of Enology.*John G. B. Castor, Ph.D., *Assistant Professor of Enology.*Albert D. Webb, Ph.D., *Assistant Professor of Enology.*Robert J. Weaver, Ph.D., *Lecturer in Viticulture.***61. Viticulture. (3) I.**

Mr. Olmo

Lectures and laboratory.

Prerequisite: Pomology 51 or consent of the instructor.

Climate in relation to grape production; grape development and ripening; history and distribution of grape growing; the principal varieties; harvesting, packing, and marketing grapes and raisins.

**62. Vineyard Operations. (3) II.**

Mr. Weaver

Lectures and laboratory.

Prerequisite: Pomology 51 or consent of the instructor.

Cultural operations in establishing and maintaining vineyards: planting; training; pruning; cultivation and irrigation; thinning and girdling. Vineyard insect and disease pests and their control. Vineyard management.



*Viticulture; Zoölogy*

70. **Enology Practice.** (1-5) I and II. I. Mr. Webb; II. Mr. Amerine  
Conference and laboratory.  
Practice in winery operation and control procedure applied in wine production.

This course may be repeated once for credit.

90. **Cellar Practice.** (1-5) I and II. Mr. Castor, Mr. Guymon  
For work on yeast and bacteria, students will enroll with Mr. Castor; for work in winery operations and distillation, with Mr. Guymon.

**ZOOLOGY**

(Department Office, 249 Animal Science Building)

Lauren E. Rosenberg, Ph.D., *Professor of Zoölogy (Chairman of the Department)*.



Walter E. Howard, Ph.D., *Lecturer in Zoölogy.*

51. **Biology of Domestic Animals.** (3) I. Mr. Howard  
Anatomy and physiology of domesticated livestock and poultry, with some attention to lower forms of animal life of economic importance. Required of all students majoring in animal-production curricula.

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## **Administrative Bulletins of the University of California 1953-1954**

The administrative bulletins of the University of California present information concerning the colleges, schools, and departments of the University. Copies of general bulletins and other information concerning instruction may be obtained by contacting the following: at Berkeley, the Registrar of the University of California, Berkeley 4; at Davis, the Registrar of the University of California, Davis; at Los Angeles, the Registrar of the University of California, Los Angeles 24; at Santa Barbara, the Registrar of the University of California, Santa Barbara; at Riverside, the Registrar of the University of California, Riverside. The bulletins of the schools and colleges in San Francisco may be obtained by contacting the deans in charge.