

UNIVERSITY  
OF  
CALIFORNIA

---

GENERAL  
CATALOGUE  
1954 - 1955



**Office of the Registrar  
University of California  
Davis, California**

# General Catalogue

Consisting of

**PART I—CIRCULAR OF INFORMATION**

(published as a separate publication on June 20, 1954)

**PART II—ANNOUNCEMENT OF COURSES**

(to be published as a separate publication on September 10, 1954)

**Fall and Spring Semesters**

**1954–1955**

**SEPTEMBER 1, 1954**

**UNIVERSITY OF CALIFORNIA, BERKELEY**

**PART I**

**Circular of Information**



# Circular of Information

BERKELEY

*Fall and Spring Semesters*

1954-1955

JUNE 20, 1954

UNIVERSITY OF CALIFORNIA

BERKELEY

## CALENDAR\*

### Referring Primarily to the Departments of the University at Berkeley

#### FALL SEMESTER, 1954-1955

July 15, Thursday	Last day for filing credentials and applications for admission graduate standing with the Dean of the Graduate Division
July 15, Thursday	Last day for filing applications for readmission to graduate standing with the Dean of the Graduate Division.
Aug. 12, Thursday	Last day for filing applications for readmission to undergraduate status with the Registrar.
Aug. 16, Monday	Final date for applications for admission to the fall semester and credentials to be filed with the Director of Admissions. Credentials received as late as this may not be evaluated in time for the enrollment of the student during the regular registration period.
Sept. 6, Monday	Labor Day—an academic and administrative holiday.
Sept. 13, Monday	Fall semester begins.
Sept. 13, Monday	Subject A Examination, 2 to 5 p.m.
Sept. 14, Tuesday	Mathematics 3 and 3A Qualifying Examination, 4:15 to 5:45 p.m.
Sept. 14, Tuesday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the fall semester.
Sept. 15, Wednesday	
Sept. 16, Thursday	
Sept. 16, Thursday	
Sept. 20, Monday	
Sept. 29, Wednesday	Chemistry 1A Aptitude Test, 4 to 5 p.m. Instruction begins. All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in January, 1955, file announcement of candidacy before 5 p.m., at the office of the Registrar, Administration Building.
Oct. 1, Friday	Last day for filing applications in candidacy for all master's degrees to be conferred in January, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 8, Friday	Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 25, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in January, 1955; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Nov. 5, Friday	Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1955.
Nov. 25, Thursday	Thanksgiving Day—an academic and administrative holiday.
Dec. 15, Wednesday	Last day for filing credentials and applications for admission to graduate standing in the spring semester.
Dec. 17, Friday	Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in January, 1955.
Dec. 20, Monday	} Christmas Recess—an academic holiday.
Jan. 1, Saturday	

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

- Dec. 24, Friday } Christmas Holiday—academic and administrative.
- Dec. 25, Saturday }
- Dec. 31, Friday } New Year's Holiday—academic and administrative.
- Jan. 1, Saturday }
- Jan. 3, Monday } Instruction resumes.
- Jan. 10, Monday } Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1955-1956.
- Jan. 17, Monday } Final examinations in the departments at Berkeley.
- Jan. 27, Thursday }
- Jan. 27, Thursday } Fall semester ends.

**SPRING SEMESTER, 1955**

- Dec. 15, Wednesday } Last day for filing credentials for admission to graduate standing with the Dean of the Graduate Division.
- Dec. 15, Wednesday } Last day for filing applications for readmission to graduate standing with the Dean of the Graduate Division.
- Jan. 6, Thursday } Last day for filing applications for readmission to undergraduate status with the Registrar.
- Jan. 15, Saturday } Applications for admission to the spring semester and credentials to be filed with the Director of Admissions.
- Feb. 7, Monday } Spring semester begins.
- Feb. 8, Tuesday } Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the spring semester.
- Feb. 9, Wednesday }
- Feb. 10, Thursday }
- Feb. 14, Monday } Instruction begins.
- Feb. 15, Tuesday } Last day for filing applications for fellowships and graduate scholarships for 1955-1956.
- Feb. 22, Tuesday } Washington's Birthday—an academic and administrative holiday.
- Feb. 24, Thursday } All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in June, 1955, file announcement of candidacy before 5 p.m., at the office of the Registrar, Administration Building.
- Feb. 25, Friday } Last day for filing applications in candidacy for all master's degrees to be conferred in June, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
- Mar. 1, Tuesday } Last day for entering students to file applications for undergraduate scholarships for 1955-1956.
- Mar. 4, Friday } Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1956; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
- Mar. 7, Monday } Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in June, 1955; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
- Mar. 25, Friday } Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1955.
- Apr. 25, Monday } Spring recess—an academic holiday.
- Apr. 30, Saturday }
- May 16, Monday } Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in June, 1955.
- May 30, Monday } Memorial Day—an academic and administrative holiday.
- June 6, Monday } Final examinations in the departments at Berkeley.
- June 16, Thursday }
- June 16, Thursday } Spring semester ends.



# CONTENTS

	PAGE
Regents of the University . . . . .	7
Administrative staff . . . . .	8

## THE UNIVERSITY

Composition of the University . . . . .	14
Administration . . . . .	15
Survey of curricula . . . . .	16
The four undergraduate colleges . . . . .	16
Professional curricula . . . . .	16
The professional schools . . . . .	17
The professional colleges . . . . .	18
Graduate curricula in engineering . . . . .	19
Special professional curricula . . . . .	19
University of California, Los Angeles . . . . .	20
Summer Sessions . . . . .	20
University Extension . . . . .	21
The University Library . . . . .	21

## ADMISSION TO THE UNIVERSITY

Admission in undergraduate status . . . . .	23
Admission in freshman standing . . . . .	23
Admission on the basis of the high school record . . . . .	23
Responsibility of high school authorities . . . . .	25
Preparation for University curricula . . . . .	26
Admission by examination . . . . .	26
Removal of admission deficiencies . . . . .	26
Admission in advanced standing . . . . .	28
Removal of scholarship deficiencies by applicants from other colleges . . . . .	28
Special requirements for engineering . . . . .	29
Limitation of enrollment of out-of-state applicants . . . . .	29
Admission of returning members of the armed forces . . . . .	30
Admission of special students . . . . .	30
Admission from schools and colleges in foreign countries . . . . .	31
Late admission and registration . . . . .	31
Admission in graduate standing . . . . .	32

## GENERAL REGULATIONS

Routine of registration . . . . .	34
Medical and physical examination . . . . .	34
Student Health Service . . . . .	35
Physical Education and use of gymnasiums . . . . .	36
Subject A: English Composition . . . . .	36
American History and American Institutions . . . . .	37
Reserve Officers' Training Corps . . . . .	38
Air Science . . . . .	38
Military Science . . . . .	39
Naval Science . . . . .	40
Study-list regulations . . . . .	40
Candidacy for degrees . . . . .	41
Change of college or major . . . . .	41
Honors . . . . .	41

	PAGE
Credit and scholarship . . . . .	42
Grades of scholarship; grade points . . . . .	42
Minimum scholarship requirements . . . . .	43
Credit by examination . . . . .	45
Final examinations . . . . .	45
Removal of deficiencies . . . . .	45
Transcript of record . . . . .	47
Leave of absence and honorable dismissal . . . . .	47
Student conduct and discipline . . . . .	48

### MISCELLANEOUS INFORMATION

Site, climate, and transportation . . . . .	49
General expenses and fees . . . . .	49
Rules governing residence . . . . .	52
Living accommodations . . . . .	52
Bureau of Occupations . . . . .	54
Student employment . . . . .	54
Senior and alumni employment . . . . .	55
Bureau of School and College Placement . . . . .	55
Counseling Center . . . . .	55
Veterans Information . . . . .	56
Selective Service . . . . .	57
Scholarships, prizes, and loans . . . . .	57

### REQUIREMENTS IN THE SEVERAL COLLEGES, SCHOOLS, AND CURRICULA

College of Letters and Science . . . . .	59
Description of group majors and curricula . . . . .	66
Honors . . . . .	78
College of Agriculture . . . . .	80
College of Architecture . . . . .	90
College of Chemistry . . . . .	92
College of Dentistry . . . . .	95
College of Engineering . . . . .	98
College of Pharmacy . . . . .	111
Schools of:	
Business Administration . . . . .	113
Criminology . . . . .	116
Education . . . . .	121
Forestry . . . . .	127
Law . . . . .	130
Librarianship . . . . .	133
Medicine . . . . .	134
Nursing . . . . .	139
Optometry . . . . .	143
Public Health . . . . .	145
Social Welfare . . . . .	149
Curriculum in Hospital Dietetics . . . . .	151
Institute of Industrial Relations . . . . .	152
Institute of Slavic Studies . . . . .	153
Graduate Division . . . . .	154



Index . . . . .	155
-----------------	-----

# THE REGENTS OF THE UNIVERSITY

## REGENTS EX OFFICIO

- His Excellency, GOODWIN J. KNIGHT, A.B.  
Governor of California and President of  
the Regents  
Sacramento 14
- HAROLD J. POWERS  
Lieutenant-Governor of California  
State Capitol, Sacramento 14
- JAMES W. SILLIMAN  
Speaker of the Assembly  
246 Hawthorne st, Salinas
- ROY E. SIMPSON, M.A., Litt.D.  
State Superintendent of Public In-  
struction  
531 Library and Courts bldg,  
Sacramento 14
- ARTHUR J. MCFADDEN, B.S., LL.B.  
President of the State Board of Agri-  
culture  
902 River lane, Santa Ana
- WILLIAM G. MERCHANT  
President of the Mechanics' Institute  
804 Mechanics' Institute bldg,  
San Francisco 4
- JOHN P. SYMES, A.B.  
President of the Alumni Association of  
the University of California  
490 California st, San Francisco 4
- ROBERT GORDON SPROUL, B.S., LL.D.,  
Litt.D.  
President of the University  
250 Administration bldg, Berkeley 4  
203 Administration bldg, Los Angeles 24

## APPOINTED REGENTS

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

- EDWARD A. DICKSON, B.L. (1958)  
425 S Windsor blvd, Los Angeles 5
- JOHN FRANCIS NEYLAN, LL.D. (1960)  
1 Montgomery st, San Francisco 4
- EDWIN W. PAULBY, B.S. (1970)  
717 N Highland av, Los Angeles 38
- BRODIE E. AHLPORT, A.B. (1956)  
5657 Wilshire blvd, Los Angeles 36
- EDWARD H. HELLER, A.B. (1958)  
600 Markt st, San Francisco 4
- VICTOR R. HANSEN, LL.B. (1962)  
Superior Court, Courthouse,  
Los Angeles 12
- EARL J. FRNSTON, A.B. (1964)  
504 Helm bldg, Fresno 1
- CHESTER W. NIMITZ, B.S., LL.D. (1956)  
728 Santa Barbara rd, Berkeley 7
- CORNELIUS J. HAGGERTY (1966)  
995 Market st, Room 810,  
San Francisco 3
- JESSE H. STEINHART, A.B., LL.B. (1962)  
111 Sutter st, San Francisco 4
- DONALD H. MCLAUGHLIN, B.S., M.A.,  
D.Eng., Ph.D. (1966)  
100 Bush st, San Francisco 4
- GUS OLSON, B.S. (1960)  
Clarksburg
- GERALD H. HAGAR, A.B., J.D. (1964)  
Central Bank bldg, Oakland 12
- HOWARD C. NAFFZIGER, B.S., M.S., M.D.  
(1968)  
University of California Medical Center,  
San Francisco 22
- EDWARD W. CARTER, A.B. (1968)  
401 S Broadway, Los Angeles 13

## OFFICERS OF THE REGENTS

- His Excellency, Goodwin J. Knight, A.B.  
Governor of California  
President  
Sacramento 14
- Edward A. Dickson, B.L.  
Chairman  
425 S Windsor blvd, Los Angeles 5
- Robert M. Underhill, B.S.  
Secretary and Treasurer  
240 Administration bldg, Berkeley 4
- James H. Corley, B.S., Vice-President—  
Business Affairs  
222 Administration bldg, Berkeley 4
- George E. Stevens  
Assistant Controller  
401 Administration bldg, Berkeley 4
- Jno. U. Calkins, Jr., B.L., J.D., Attorney  
128 Administration bldg, Berkeley 4
- Ashley H. Conard, B.L., J.D.  
Associate Attorney for the Regents and  
Attorney in Residence Matters  
128 Administration bldg, Berkeley 4
- John E. Landon, A.B., LL.B.  
Assistant Attorney  
128 Administration bldg, Berkeley 4
- George D. Mallory, A.B.  
Assistant Treasurer and Assistant  
Secretary  
240 Administration bldg, Berkeley 4
- George F. Taylor, B.S.  
Assistant Secretary  
204 Administration bldg, Los Angeles 24
- Miss Marjorie J. Woolman  
Assistant Secretary  
240 Administration bldg, Berkeley 4



## ADMINISTRATIVE STAFF OF THE UNIVERSITY

### *President of the University:*

Robert G. Sproul  
250 Administration bldg, Berkeley 4  
203 Administration bldg, Los Angeles 24

### *Chancellor at Berkeley:*

Clark Kerr  
3335 Dwinelle Hall, Berkeley 4

### *Chancellor at Los Angeles:*

Raymond B. Allen  
202 Administration bldg, Los Angeles 24

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

Monroe E. Deutsch

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

Claude B. Hutchison

### *Vice-President—Agricultural Sciences:*

Harry R. Wellman  
101 Giannini Hall, Berkeley 4

### *Vice-President—Business Affairs:*

James H. Corley  
222 Administration bldg, Berkeley 4  
204 Administration bldg, Los Angeles 24

### *Vice-President—University Extension:*

Baldwin M. Woods  
University Extension, Berkeley 4  
Building 5A, Los Angeles 24

### *Provost of Santa Barbara College:*

J. Harold Williams  
110 Administration bldg, Santa Barbara

### *Provost of Riverside Campus:*

Gordon S. Watkins  
1340 Social Sciences—Humanities bldg,  
Riverside

### *Provost of Davis Campus:*

Stanley B. Freeborn  
203 Library-Administration bldg, Davis

### *Secretary and Treasurer of the Regents:*

Robert M. Underhill  
George D. Mallory, *Assistant Treasurer and Assistant Secretary*  
Miss Marjorie J. Woolman, *Assistant Secretary*  
240 Administration bldg, Berkeley 4  
George F. Taylor, *Assistant Secretary*  
204 Administration bldg, Los Angeles 24

### *Attorney for the Regents:*

Jno. U. Calkins, Jr.  
Ashley H. Conard, *Associate Attorney for the Regents and Attorney in Residence Matters*  
John E. Landon, *Assistant Attorney*  
128 Administration bldg, Berkeley 4

### *Controller:*

George E. Stevens, *Assistant Controller*  
401 Administration bldg, Berkeley 4

### *Budget Officer:*

Ellis J. Groff  
239C Administration bldg, Berkeley 4

### *Assistant to the President:*

George A. Pettitt  
225 Administration bldg, Berkeley 4

### *Director of Admissions:*

Herman A. Spindt  
127 Administration bldg, Berkeley 4  
100 Administration bldg, Los Angeles 24  
Edgar L. Lazier, *Associate Director*  
100 Administration bldg, Los Angeles 24

### *Registrars and Recorder:*

**BERKELEY**  
Thomas B. Steel, *Registrar*  
Miss Virginia F. Green, *Assistant Registrar*  
Hobart M. Lovett, *Assistant Registrar*  
John T. Peterson, *Assistant Registrar*  
120 Administration bldg, Berkeley 4

### **DAVIS**

Howard B. Shontz, *Registrar*  
Miss J. Clare McGee, *Assistant Registrar*  
138 Library-Administration bldg, Davis

### **LOS ANGELES**

William C. Pomeroy, *Registrar*  
Mrs. Carmelita Stanley, *Assistant Registrar*  
137 Administration bldg, Los Angeles 24

### **RIVERSIDE**

Clinton C. Gilliam, *Registrar*  
1312 Social Sciences—Humanities bldg,  
Riverside

### **SAN FRANCISCO**

Mrs. M. Helen Chryst, *Recorder*  
62B University Hospital,  
San Francisco 22

Arthur M. Sammis, *Registrar*  
Hastings College of the Law  
Hyde and McAllister sts,  
San Francisco 2

### **SANTA BARBARA**

Paul W. Wright, *Registrar*  
105 Administration bldg, Santa Barbara

### *Deans of the Graduate Division:*

#### *Northern section:*

William E. Dennes  
James M. Oline, *Associate Dean*  
Francis A. Jenkins, *Associate Dean*  
Morris A. Stewart, *Associate Dean*  
102 Administration bldg, Berkeley 4  
Fred N. Briggs, *Associate Dean*  
201 Library-Administration bldg, Davis

#### *Southern section:*

Vern O. Knudsen  
Gustave O. Arlt, *Associate Dean*  
Leo P. Delsasso, *Assistant Dean*  
120 Administration bldg, Los Angeles 24

### *Deans of Students:*

#### **BERKELEY**

Hurford E. Stone  
Miss Katherine A. Towle, *Dean of Women and Associate Dean of Students*  
Miss Alice G. Hoyt, *Associate Dean of Women*  
Chaffee E. Hall, Jr., *Associate Dean*  
Clinton C. Conrad, *Assistant Dean*  
Alexander S. Levens, *Assistant Dean*  
Mrs. Catharine DeMotte Quire, *Assistant Dean of Women*  
Mrs. Marguerite M. Van Derwerker, *Counselor for Group Activities*

- Mrs. Ruth N. Donnelly, *Housing Supervisor*  
201 Administration bldg, Berkeley 4
- DAVIS  
Lysle D. Leach  
Mrs. Susan F. Regan, *Dean of Women and Assistant Dean of Students*  
121 Library-Administration bldg, Davis
- LOS ANGELES  
Milton E. Hahn  
Byron H. Atkinson, *Assistant Dean*  
Mrs. Nola-Stark Rogers, *Assistant Dean*  
275 Administration bldg, Los Angeles 24  
Paul C. Hannum, *Housing Supervisor*  
204 Administration bldg, Los Angeles 24
- RIVERSIDE  
Thomas L. Broadbent  
Miss Loda Mae Davis, *Dean of Women and Associate Dean of Students*  
1920 Social Sciences-Humanities bldg, Riverside
- SAN FRANCISCO  
Herbert G. Johnstone  
52 University Hospital,  
San Francisco 22
- SANTA BARBARA  
Lyle G. Reynolds, *Dean of Men*  
109 Administration bldg, Santa Barbara  
Helen E. Sweet, *Dean of Women*  
104A Administration bldg,  
Santa Barbara  
Miss Velma Morrell, *Housing Supervisor*  
125 Quad, Santa Barbara
- Deans of the College of Agriculture:*
- BERKELEY  
Knowles A. Ryerson  
101 Giannini Hall, Berkeley 4
- DAVIS  
Fred N. Briggs  
201 Library-Administration bldg, Davis
- LOS ANGELES  
Robert W. Hodgson  
146 Physics-Biology bldg, Los Angeles 24
- Dean of the College of Applied Arts:*  
David F. Jackey  
247 Administration bldg, Los Angeles 24  
John C. Snidecor, *Divisional Dean of Applied Arts*  
107 Administration bldg, Santa Barbara
- Dean of the College of Architecture:*  
William W. Wurster  
1 Architecture bldg, Berkeley 4
- Dean of the College of Chemistry:*  
Kenneth S. Pitzer  
Donald S. Noyce, *Assistant Dean*  
110 Gilman Hall, Berkeley 4
- Dean of the College of Dentistry:*  
Willard C. Fleming  
Wendell L. Wylie, *Assistant Dean*  
630 Medical Sciences bldg,  
San Francisco 22
- Deans of the Colleges of Engineering:*  
Morrrough P. O'Brien  
Everett D. Howe, *Associate Dean*  
E. Paul DeGarmo, *Assistant Dean*  
James L. Meriam, *Assistant Dean*  
218 Engineering bldg, Berkeley 4
- Roy Bainer, *Assistant Dean*  
207 Agricultural Engineering bldg,  
Davis  
Llewellyn M. K. Boelter  
Wesley L. Orr, *Assistant Dean*  
Charles M. Duke, *Assistant Dean for Undergraduate Students*  
3066 Engineering bldg, Los Angeles 24
- Dean of Hastings College of the Law:*  
David E. Snodgrass  
Edward A. Hogan, Jr., *Vice-Dean*  
Hyde and McAllister sts,  
San Francisco 2
- Deans of the Colleges of Letters and Science:*
- BERKELEY  
Alva R. Davis  
Edward W. Strong, *Associate Dean*  
Charles Aikin, *Assistant Dean*  
Arthur E. Hutson, *Assistant Dean*  
Gerald E. Marsh, *Assistant Dean*  
Lesley B. Simpson, *Assistant Dean*  
Lee H. Swinford, *Assistant Dean*  
210 Administration bldg, Berkeley 4
- DAVIS  
Herbert A. Young  
212 Library-Administration bldg, Davis
- LOS ANGELES  
Paul A. Dodd  
J. W. Robson, *Associate Dean*  
William G. Young, *Divisional Dean of Physical Sciences*  
Franklin P. Rolfe, *Divisional Dean of the Humanities*  
Roy M. Dorcus, *Divisional Dean of Life Sciences*  
J. A. C. Grant, *Divisional Dean of Social Sciences*  
239 Administration bldg, Los Angeles 24
- RIVERSIDE  
Robert A. Nisbet  
1330 Social Sciences-Humanities bldg,  
Riverside
- SANTA BARBARA  
Elmer R. Noble, *Divisional Dean of Liberal Arts*  
106 Administration bldg, Santa Barbara
- Dean of the College of Pharmacy:*  
Troy C. Daniels  
John J. Eiler, *Assistant Dean*  
202 Pharmacy bldg, San Francisco 22
- Deans of the Schools of Business Administration:*  
Ewald T. Grether  
Roy W. Jastram, *Associate Dean*  
113 South Hall, Berkeley 4  
\*Neil H. Jacoby  
G. W. Robbins, *Acting Dean*  
J. Fred Weston, *Acting Associate Dean for Student Affairs*  
Robert B. Buchele, *Assistant Dean*  
250 Business Administration-Economics bldg, Los Angeles 24
- Dean of the School of Criminology:*  
Orlando W. Wilson  
218 Building T-2, Berkeley 4
- Deans of the Schools of Education:*  
William A. Brownell  
207 Haviland Hall, Berkeley 4

\* Absent on leave.

- Edwin A. Lee  
Clarence Fielstra, *Assistant Dean*  
231 Education bldg, Los Angeles 24
- Dean of the School of Forestry:*  
Frederick S. Baker  
243 Forestry bldg, Berkeley 4
- Deans of the Schools of Law:*  
William L. Prosser  
William N. Keeler, *Assistant Dean*  
225 Law bldg, Berkeley 4
- L. Dale Coffman  
163 Law bldg, Los Angeles 24
- Dean of the School of Librarianship:*  
J. Periam Danton  
425 Library, Berkeley 4
- Deans of the Schools of Medicine:*  
Francis S. Smyth  
John B. Lagen, *Associate Dean*  
126 Medical Sciences bldg,  
San Francisco 22
- Stafford L. Warren  
Joel J. Pressman, *Assistant Dean*  
5D Temporary Medical School bldg,  
Los Angeles 24
- Deans of the Schools of Nursing:*  
BERKELEY-SAN FRANCISCO  
Miss Margaret A. Tracy  
Miss Pearl Castile, *Assistant Dean*  
210 Building T-8, Berkeley 4  
509 Clinic bldg, San Francisco 22
- LOS ANGELES  
Mrs. Lulu Wolf Hassenplug  
124 Building 3P, Los Angeles 24
- Dean of the School of Optometry:*  
Kenneth B. Stoddard  
101 Optometry bldg, Berkeley 4
- Dean of the School of Public Health:*  
Charles E. Smith  
216 Building T-4, Berkeley 4
- Deans of the Schools of Social Welfare:*  
Milton Chernin  
222 Building T-1, Berkeley 4  
Donald S. Howard  
1 Building 1A, Los Angeles 24
- Dean of the School of Veterinary Medicine:*  
Donald E. Jasper  
Oscar W. Schalm, *Associate Dean*  
1018 Haring Hall, Davis
- Director of Relations with Schools:*  
Hiram W. Edwards  
Miss Grace V. Bird, *Associate Director*  
Owen Guinn Smith, *Assistant Director*  
119 Administration bldg, Berkeley 4  
J. Price Gittinger, *Assistant Director*  
206 Library-Administration bldg, Davis  
Vern W. Robinson, *Associate Director*  
Bonham Campbell, *Assistant Director*  
183 Administration bldg, Los Angeles 24  
Clinton C. Gilliam, *Assistant Director*  
1312 Social Sciences-Humanities bldg,  
Riverside  
Willard R. McRary, *Assistant Director*  
109 Building B, Santa Barbara
- University Extension:*  
Baldwin M. Woods, *Vice-President—*  
*University Extension and Director of*  
*University Extension*  
University Extension, Berkeley 4
- BERKELEY  
Thomas N. Barrows, *Associate Director*  
\*Richard J. Miller, *Assistant Director*  
Henry C. Waring, *Business Manager*  
University Extension, Berkeley 4
- LOS ANGELES  
Paul H. Sheats, *Associate Director*  
Abbott Kaplan, *Assistant Director*  
Building 5A, Los Angeles 24  
George M. Jamieson, Jr., *Business Manager*  
Building 5B, Los Angeles 24
- SANTA BARBARA  
Emanuel E. Ericson, *Assistant Director*  
906 Santa Barbara st, Santa Barbara
- Director of the George Williams Hooper*  
*Foundation (for Medical Research):*  
Karl F. Meyer  
807 Hooper Foundation,  
San Francisco 22
- Director of the Lick Observatory:*  
C. Donald Shane  
Lick Observatory, Mount Hamilton
- Director of the Scripps Institution of*  
*Oceanography:*  
Roger E. Revelle  
Scripps Institution of Oceanography,  
La Jolla
- Director of the Agricultural Experiment*  
*Station:*  
Paul F. Sharp  
Knowles A. Ryerson, *Assistant Director*  
101 Giannini Hall, Berkeley 4  
Fred N. Briggs, *Assistant Director*  
201 Library-Administration bldg, Davis  
Robert W. Hodgson, *Assistant Director*  
146 Physics-Biology bldg, Los Angeles 24  
Alfred M. Boyce, *Assistant Director*  
108 Administration bldg, Riverside
- Director of the Citrus Experiment Station:*  
Alfred M. Boyce  
108 Administration bldg, Riverside
- Director of Agricultural Extension:*  
\*J. Earl Coke  
Wayne F. Weeks, *Acting Director*  
140 Giannini Hall, Berkeley 4
- Director of the California School of Fine*  
*Arts:*  
Ernest K. Mundt  
800 Chestnut st, San Francisco 11
- Director of the Los Alamos Scientific Lab-*  
*oratory:*  
Norris E. Bradbury  
Los Alamos, New Mexico
- Librarians*  
BERKELEY  
Donald Coney  
Marion A. Milczewski, *Assistant*  
*Librarian*  
Melvin J. Voigt, *Assistant Librarian*  
Mrs. Helen M. Worden, *Assistant*  
*Librarian*  
245 Library Annex, Berkeley 4
- DAVIS  
J. Richard Blanchard  
231 Library-Administration bldg, Davis

\* Absent on leave.



LA JOLLA  
W. Roy Holleman  
Scripps Institution of Oceanography,  
La Jolla

LOS ANGELES  
Lawrence C. Powell  
Andrew H. Horn, *Associate Librarian*  
Gordon R. Williams, *Assistant Librarian*  
134 Library, Los Angeles 24

MOUNT HAMILTON  
Stanislavs Vasilevskis  
Lick Observatory, Mount Hamilton

RIVERSIDE  
Edwin T. Coman, Jr.  
College of Letters and Science Library  
139B Library, Riverside  
Miss Margaret S. Buvens  
Citrus Experiment Station Library  
229B Library, Riverside

SAN FRANCISCO  
John B. deC. M. Saunders (Medical  
Center)  
104 Medical School bldg,  
San Francisco 22

SANTA BARBARA  
Donald C. Davidson  
200D Administration bldg,  
Santa Barbara

**Business Office:**

James H. Corley, *Vice-President—Business Affairs*  
222 Administration bldg, Berkeley 4  
204 Administration bldg, Los Angeles 24

BERKELEY  
William J. Norton, *Business Manager*  
3413 Dwinelle Hall, Berkeley 4

DAVIS  
Ira F. Smith, *Business Manager*  
101 Library-Administration bldg, Davis

LA JOLLA  
John C. Kirby, *Business Manager*  
Scripps Institution of Oceanography,  
La Jolla

LOS ANGELES  
George F. Taylor, *Business Manager*  
204 Administration bldg, Los Angeles 24

RIVERSIDE  
Charles B. O'Neill, *Business Manager*  
1344 Social Sciences-Humanities bldg,  
Riverside

SAN FRANCISCO  
William B. Hall, *Administrator, University Hospitals*  
105 University Hospital, San Francisco 22

Harold H. Hixson, *Associate Administrator, University Hospitals*  
George Henry Vogt, *Assistant Administrator, University Hospitals*  
Jerome Yalon, *Assistant Administrator, University Hospitals*  
Stanley C. Bateman, *Business Manager*  
102 University Hospital, San Francisco 22

SANTA BARBARA  
J. A. D. Muncy, *Business Manager*  
Santa Barbara College, Santa Barbara

LOS ANGELES (School of Medicine)  
Kenneth M. Eastman, *Hospital Administrator*

Russell B. Williams, *Assistant Hospital Administrator*  
5D Temporary Medical School bldg,  
Los Angeles 24

**Office of the Controller:**

George E. Stevens, *Assistant Controller*  
401 Administration bldg, Berkeley 4

BERKELEY  
Edwin C. Linsley, *Accounting Officer*  
2270 Telegraph av, Berkeley 4  
O. P. Webb, *Accounting Officer*  
Radiation Laboratory, Berkeley 4

DAVIS  
Mahlon F. Cook, *Accounting Officer*  
109 Library-Administration bldg, Davis

LA JOLLA  
Philip M. Douglas, *Accounting Officer*  
Scripps Institution of Oceanography,  
La Jolla

LOS ANGELES  
Robert A. Rogers, *Accounting Officer*  
319 Administration bldg, Los Angeles 24

RIVERSIDE  
John H. Clark, *Accounting Officer*  
1303 Social Sciences-Humanities bldg,  
Riverside

SAN FRANCISCO  
William W. Robertson, *Accounting Officer*  
1 Medical School bldg, San Francisco 22

SANTA BARBARA  
Lawrence N. Jacobs, *Accounting Officer*  
Building C, Santa Barbara

LOS ALAMOS  
A. Dwight Richardson, *Accounting Officer*  
Los Alamos Scientific Laboratory,  
Los Alamos, New Mexico

**Chief Purchasing Agent:**

Lewis G. Baker  
F. S. Harter, *Purchasing Agent*  
318 Administration bldg, Berkeley 4  
David L. Wilt, *Purchasing Agent*  
150 Administration bldg, Los Angeles 24  
James D. Hahn, *Purchasing Agent*  
201 Laundry-Storehouse bldg,  
San Francisco 22

**Manager of Insurance and Retirement Systems:**

Roy C. Ploss  
David T. McKibben, *Assistant Manager*  
317 Administration bldg, Berkeley 4

**Nonacademic Personnel Office:**

Boynton S. Kaiser, *Chief Personnel Officer*  
George F. McGregor, *Personnel Officer*  
2260 Telegraph av, Berkeley 4  
Charles B. Strawn, *Personnel Officer*  
115 Library-Administration bldg, Davis  
Mrs. Ruth Handley, *Personnel Officer*  
Scripps Institution of Oceanography,  
La Jolla

Miss Mildred L. Foreman, *Personnel Officer*  
191 Administration bldg, Los Angeles 24  
Mrs. Phyllis P. Staples, *Personnel Officer*  
1347 Social Sciences-Humanities bldg,  
Riverside.

Lewis B. Perry, *Personnel Officer*  
52 Hospital bldg, San Francisco 22  
Miss Velma Morrell, *Personnel Officer*  
125 Quad, Santa Barbara

**Offices of Public Information :**

Maynard T. Morris, *Manager*  
101 Administration bldg, Berkeley 4  
Ralph D. Smith, *Manager*  
101 Faculty Club, Davis  
Andrew J. Hamilton, *Manager*  
139 Administration bldg, Los Angeles 24  
Howard S. Cook, Jr., *Manager*  
1349 Social Sciences-Humanities bldg,  
Riverside  
E. George Obern, *Manager*  
104 South Hall, Santa Barbara  
David M. Stearns, *Technical Informa-  
tion Adviser*  
Los Alamos Scientific Laboratory,  
Los Alamos, New Mexico

**Offices of Publications :**

William F. Calkins, *Manager of Agricul-  
tural Publications*  
22 Giannini Hall, Berkeley 4  
101 Faculty Club, Davis  
Edward G. Berenson, *Manager of Offi-  
cial Publications*  
1 Administration bldg, Berkeley 4  
Thomas A. Manar, *Manager of Ocean-  
ographic Publications*  
Scripps Institution of Oceanography,  
La Jolla

**Office of Radio Administration :**

Hale Sparks, *Manager*  
139 Administration bldg, Los Angeles 24

**University Press :**

August Frugé, *Manager, Publishing De-  
partment*  
William J. Young, *Manager, Printing  
Department*  
University Press, Berkeley 4

**Manager of the Bureau of School and Col-  
lege Placement :**

Lloyd D. Bernard  
207 Administration bldg, Berkeley 4  
123 Education bldg, Los Angeles 24  
Aubrey L. Berry, *Assistant Manager,  
Office of Teacher Placement*  
123 Education bldg, Los Angeles 24  
E. L. Chalberg, *Placement Executive,*  
101 Quad, Santa Barbara

**Bureau of Occupations :**

Miss Vera L. Christie, *Placement Office  
Manager*  
South Hall Annex, Berkeley 4  
Burton King, *Placement Office Manager*  
8 Recreation Hall, Davis  
John W. Adams, *Placement Office Man-  
ager*  
162 Administration bldg, Los Angeles 24

**Counseling Centers :**

Mrs. Barbara A. Kirk, *Manager*  
200 Building T-5, Berkeley 4  
Mrs. Dorothy M. Clendenen, *Manager*  
291 Administration bldg, Los Angeles 24

**University Physicians :**

BERKELEY  
William G. Donald  
Mrs. Margaret Zeff, *Assistant University  
Physician*  
Ernest V. Cowell Memorial Hospital,  
Berkeley 4

DAVIS

J. Homer Woolsey, *Director, Student  
Health Service*  
Student Health Center, Davis

LOS ANGELES

Donald S. MacKinnon, *Director, Student  
Health Service*  
Gertrude T. Huberty, *Assistant Director*  
Building 8T, Los Angeles 24

SAN FRANCISCO

Miss Elenore J. Erickson, *Director, Stu-  
dent Health Service*  
120 Medical School bldg,  
San Francisco 22

SANTA BARBARA

Wilfred T. Robbins, *Director, Student  
Health Service*  
105 Building A, Santa Barbara

**Director of Hospitals and Infirmaries :**

Richard J. Stull  
107 Hospital bldg, San Francisco 22

**Grounds and Buildings :**

Joseph W. Hutchison, *Principal Super-  
intendent*  
Grounds and Buildings, Berkeley 4  
L. Terry Suber, Jr., *Principal Superin-  
tendent*  
106 Library-Administration bldg, Davis  
Raymond Haworth, *Superintendent*  
Scripps Institution of Oceanography,  
La Jolla  
Laurence H. Sweeney, *Principal Super-  
intendent*  
106 Service bldg, Los Angeles 24  
Henning J. Noren, *Superintendent*  
Lick Observatory, Mount Hamilton  
Harold D. Boen, *Senior Superintendent*  
5 Administration bldg, Riverside  
William H. Dufton, *Principal Superin-  
tendent*  
1 Grounds and Buildings,  
San Francisco 22  
William F. Madden, *Senior Superintend-  
ent*  
1 Quad Area, Santa Barbara

**Foreign Student Advisers :**

Allen C. Blaisdell  
International House, Berkeley 4  
J. Price Gittinger  
206 Library-Administration bldg, Davis  
Clifford H. Prator  
287 Administration bldg, Los Angeles 24  
Lyle G. Reynolds  
109 Administration bldg, Santa Barbara  
Thomas L. Broadbent  
1306 Social Sciences-Humanities bldg,  
Riverside

**Veterans Affairs :**

Myron E. Krueger, *Chairman, Adminis-  
trative Committee on Veterans Edu-  
cation*  
243 Forestry bldg, Berkeley 4

James G. Siler, *Vice-Chairman, Administrative Committee on Veterans Education, and Supervisor of Special Services*

2227 Union st, Berkeley 4

Donald P. LaBoskey, *Supervisor of Special Services*

38 Administration bldg, Los Angeles 24

Lyle G. Reynolds, *Dean of Men*

109 Administration bldg, Santa Barbara

Herbert G. Johnstone, *Dean of Students*

52 University Hospital, San Francisco 22

J. Price Gittinger, *Director of Special Services*

206 Library-Administration bldg, Davis

Clinton O. Gilliam, *Registrar*

1311 Social Sciences-Humanities bldg, Riverside

Mrs. Edythe Hutchins Taylor, *Senior Administrative Assistant*

University Extension, Berkeley 4

Mrs. Sarabel C. Danowski, *Administrative Assistant*

University Extension, Los Angeles 24

Caleb A. Lewis, *Senior Extension Representative, University Extension*

1015 Seventh av, San Diego 1

Mrs. Mildred Stauffer, *Extension Representative, University Extension*

906 Santa Barbara st, Santa Barbara

# THE UNIVERSITY OF CALIFORNIA

FOUNDED 1868

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

## I. AT BERKELEY

The Colleges of Letters and Science, Agriculture, Architecture, Chemistry, Engineering, Pharmacy (first year of the B.S. curriculum); The Schools of Business Administration, Criminology, Education, Forestry, Law, Librarianship, Medicine (first year), Nursing (in part), Optometry, Public Health (in part), Social Welfare.

The Graduate Division (Northern Section); The University Extension (offering instruction wherever classes can be formed, or anywhere in California by correspondence, and providing lectures, recitals, moving pictures, and other material for visual instruction); The Agricultural Extension Service; The Agricultural Experiment Station (in part); The Giannini Foundation of Agricultural Economics; The California Museum of Vertebrate Zoölogy; The Museum of Paleontology; The Anthropological Museum; The Heller Committee for Research in Social Economics; The Institutes of Child Welfare, of East Asiatic Studies, of Engineering Research, of Experimental Biology, of Geophysics (in part), of Industrial Relations (in part), of Slavic Studies (in part), of Transportation and Traffic Engineering (in part); The Bureaus of Business and Economic Research (in part), of International Relations, of Public Administration; The William H. Crocker Radiation Laboratory; The University Art Gallery; The University of California Press; The University Library.

## Departments of Instruction in the Colleges at Berkeley

Agricultural Chemistry, Agricultural Economics, Agricultural Engineering, Agronomy, Air Science and Tactics, Anatomy,\* Anthropology, Architecture, Art, Astronomy, Bacteriology, Biochemistry, Botany, Business Administration, Chemistry and Chemical Engineering, City and Regional Planning, Classics (Greek, Latin, Sanskrit), Criminology, Decorative Art, Dramatic Art, Economics, Education, Engineering (civil and irrigation, electrical, engineering design, mechanical, mineral technology, transportation), English, Entomology and Parasitology, Food Technology, Forestry, French, Genetics, Geography, Geological Sciences (and Mineralogy), German, History, Home Economics, Italian, Journalism, Landscape Architecture, Law, Librarianship, Linguistics, Mathematics, Military Science and Tactics, Music, Naval Science, Near Eastern Languages, Nursing, Optometry (and Physiological Optics), Oriental Languages, Paleontology, Philosophy, Physical Education, Physics, Physiological Chemistry,\* Physiology,\* Plant Biochemistry, Plant Nutrition, Plant Pathology, Political Science, Pomology, Poultry Husbandry, Psychology, Public Health, Romance Philology, Scandinavian, Slavic Languages and Literatures, Social Welfare, Sociology and Social Institutions, Soils, Spanish and Portuguese, Speech, Vegetable Crops, Zoölogy.

\* A department of the School of Medicine.

**II. AT LOS ANGELES†**

The Colleges of Letters and Science, Engineering, Applied Arts, Agriculture, Pharmacy (in part); The Schools of Business Administration, Education, Law, Medicine, Nursing, Public Health (in part), Social Welfare; The Graduate Division (Southern Section); Agricultural Experiment Station (in part); The Bureaus of Business and Economic Research (in part), of Governmental Research; The Institutes of Geophysics (in part), of Industrial Relations (in part), of Slavic Studies (in part), of Transportation and Traffic Engineering (in part); The University Library; The Senator William Andrews Clark Memorial Library.

**III. AT SAN FRANCISCO**

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

**IV. AT DAVIS**

The College of Agriculture, including the Farm, the College of Letters and Science, the School of Veterinary Medicine, and certain departments of the College of Agriculture and of the Agricultural Experiment Station.

**V. AT RIVERSIDE**

The College of Agriculture (including the Citrus Experiment Station) and The College of Letters and Science.

**VI. AT MOUNT HAMILTON**

The Lick Astronomical Department (Lick Observatory).

**VII. AT LA JOLLA**

The Scripps Institution of Oceanography.

**VIII. AT SANTA BARBARA**

Santa Barbara College.

**DIVISION OF AGRICULTURAL SCIENCES**

There is established a Division of Agricultural Sciences which shall consist of the College of Agriculture, the School of Forestry, the School of Veterinary Medicine, the Agricultural Extension Service, the Agricultural Experiment Station, the Citrus Experiment Station, the Giannini Foundation of Agricultural Economics, and the Kearney Foundation of Soil Science.

**ADMINISTRATION**

The Regents of the University of California, by authority vested in them by the State constitution, created an academic administrative body called the Academic Senate. The Senate, subject to the approval of the Regents, determines the conditions for admission, for certificates, and for degrees. It authorizes and supervises all courses of instruction in the academic and professional colleges and schools. It recommends to the Regents all candidates for degrees in course. The Dean or director of a school, college, or other division of the University is entrusted with the duty of assisting the President in the administration of the University, with special reference to the welfare of the particular school, college, or other division concerned, and of the students therein.\*

\* For a list of the administrative staff of the University at Berkeley, and elsewhere, see page 8.

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

**SURVEY OF CURRICULA**

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

**THE FOUR ACADEMIC UNDERGRADUATE COLLEGES**

Four academic colleges at Berkeley offer undergraduate curricula of four years, leading, in the College of Letters and Science, to the bachelor's degree in arts (A.B.), and in the three colleges of applied sciences to the bachelor's degree in science (B.S.); additionally, students who enter the Armed Services before completing all requirements for the bachelor of science degree in engineering may be granted the degree Bachelor of Applied Science. Students who complete successfully the first two years of the undergraduate curriculum in the College of Letters and Science will qualify for the award of the degree of Associate in Arts. The undergraduate colleges are:

College of Letters and Science

Colleges of applied sciences—

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

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

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

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

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

In mechanical engineering, the student has a choice of options in aeronautics, air conditioning and refrigeration, automotive, electrical engineering, fluid mechanics, heat power, heat transfer and thermodynamics, industrial, marine engineering and naval architecture, mechanical design, or process engineering.

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

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

In petroleum engineering, the student has a choice of options in development or production.

**PROFESSIONAL CURRICULA**

The professional curricula offered by the University are based on two or more years of undergraduate work. Some of the curricula may be carried to completion at Berkeley; others must be pursued in part at Berkeley and completed in San Francisco or at Davis; others may be pursued in full in San Francisco. These curricula lead to the higher degrees, or to degrees and/or certificates, in the respective fields of architecture, bioradiology, business administration, city planning, criminology, dentistry, education, engineering, forestry, journalism,

law, librarianship, medicine, pharmacy, public health, nursing, optometry, and social welfare. Full details of the respective curricula will be found in later pages of this bulletin.

#### *The Professional Schools—*

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

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

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

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

The School of Law offers the following curricula:

1. A three-year curriculum leading to the degree of Bachelor of Laws. Applicants for admission to the professional curriculum must have received the degree of Bachelor of Arts or Bachelor of Science from the University of California, or an equivalent degree from a college or university of approved standing. (For admission requirements, see under School of Law in later pages of this bulletin and consult the ANNOUNCEMENT OF THE SCHOOL OF LAW, a copy of which may be obtained from the Dean of the School.)

2. A graduate curriculum of one year, based on the degree of Bachelor of Laws and leading to the degree of Master of Laws (LL.M.) or Doctor of the Science of Law (J.S.D.).

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

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



degree of Bachelor of Arts from the college. The second, third, and fourth years of the curriculum of the School of Medicine are given in San Francisco, and lead to the degree of Doctor of Medicine.

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

The School of Nursing, in connection with the University Hospital, offers a curriculum of five years, leading to the degree of Bachelor of Science, and to a Certificate in Nursing. Matriculation and the completion of the lower division requirements in the College of Letters and Science or in the College of Applied Arts are required. The program includes two years in the College of Letters and Science at Berkeley or Los Angeles or in the College of Applied Arts at Los Angeles, and three years in the School of Nursing.

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

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

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

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

#### *The Professional Colleges—*

The College of Architecture offers a five-year curriculum leading to the degree of Bachelor of Architecture and a graduate curriculum of two years leading to the degree of Graduate in Architecture. Students admitted (through September, 1955) to the College of Architecture under regulations in effect for admission to the School of Architecture prior to the establishment of the College may be granted the Bachelor of Arts degree.

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

The degree of Bachelor of Science is awarded for completion of the work of the first five years—two years in the College of Letters and Science at Berkeley or Los Angeles, followed by three years of the four-year professional curriculum in the College of Dentistry at San Francisco—and the degree of Doctor of Dental Surgery is awarded after one additional year (the fourth year of the professional curriculum) in San Francisco. The degree of Master of Dental Surgery is awarded upon completion of a graduate curriculum of three years, following receipt of the degree of Doctor of Dental Surgery.

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

Hastings College of the Law offers two curricula, both leading to the degree of Bachelor of Laws: a three-year curriculum based upon completion of ninety units of undergraduate work acceptable toward a bachelor's degree in the College of Letters and Science of the University of California (a total of six

years) and a four-year curriculum based upon completion of sixty or more units of acceptable undergraduate work (a total of six years).

The College of Pharmacy offers two four-year curricula, each of which leads to the degree Bachelor of Science in Pharmacy, and a fifth year of study which, for properly qualified students, leads to the degree Master of Pharmacy. The requirements for admission are the same as those for academic departments of the University and in addition 30 units of college work in the University of California or in another institution of approved standing. The first year of this curriculum is given at Berkeley and Los Angeles; the final three years comprise specialized training in the College of Pharmacy in San Francisco.

The College of Pharmacy also issues a certificate of completion to students who, having already received the Bachelor of Science degree in that college, complete an additional year of residence in order to become eligible for the State Board of Pharmacy examinations for the licentiate in Pharmacy.

#### *Graduate Curricula in Engineering—*

Curricula in engineering lead to the advanced professional degrees: Master of Engineering and Doctor of Engineering.

#### *Special Professional Curricula—*

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

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

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

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

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

The course for medical technicians is given at the School of Medicine in San Francisco. It consists of twelve months of full-time work and leads to a Certificate of Completion of the Curriculum in Medical Technology.

The course for X-ray technicians is offered at the University of California

Medical Center, San Francisco. It extends through a full year and leads to a Certificate of Completion of the Course for X-ray Technicians.

The course for technicians in exfoliative cytology is given at the School of Medicine in San Francisco. The requirements for admission to the course are a bachelor's degree in medical sciences and a certificate in medical laboratory techniques. It requires a period of four months and leads to a Certificate of Completion of the Course for Technicians in Exfoliative Cytology.

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

A field of study in journalism leads to the degree of Master of Journalism after at least one year of prescribed graduate work. Candidates must have received the bachelor's degree, must have completed an approved program of study, and must have passed a comprehensive final examination.

A field of study in bioradiology leads to the degree of Master of Bioradiology after at least two years of prescribed work. Candidates must have received a bachelor's degree and must have completed an approved program of study.

#### UNIVERSITY OF CALIFORNIA, LOS ANGELES

Instruction at the University of California, Los Angeles, is offered in (a) the College of Letters and Science, with curricula leading to the degree of Associate in Arts, Bachelor of Arts, and Bachelor of Science, curricula of the earlier years of the College of Dentistry and of the School of Medicine; (b) the School of Business Administration, with curricula leading to the degree of Bachelor of Science; (c) the College of Applied Arts, with curricula leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science, curricula of the earlier years of the School of Nursing, of the School of Optometry, and of the School of Public Health; (d) the College of Engineering, with curricula leading to the degree of Bachelor of Science; (e) the College of Agriculture, with curricula leading to the degree of Bachelor of Science; (f) the School of Public Health, with curricula leading to the degree of Bachelor of Science; (g) the School of Nursing, with curricula leading to the degree of Bachelor of Science; (h) the School of Law, with a curriculum leading to the degree of Bachelor of Laws; and (i) the School of Medicine with a curriculum leading to the degree of Doctor of Medicine. Students electing certain curricula in the College of Agriculture may register at Los Angeles for the first two years and then transfer to Berkeley or Davis to complete the requirements for the degree. The School of Education at Los Angeles supervises curricula leading to the Certificate of Completion for the various elementary and secondary teaching credentials, and for the administrative credential. Graduate study, leading to the degrees of Master of Science, Master of Arts, Master of Business Administration, and Master of Social Welfare, and to the degrees of Doctor of Philosophy and Doctor of Education, also is available at the University of California, Los Angeles.

#### SUMMER SESSIONS

During the summer the University conducts at Berkeley one or more sessions of six weeks' duration each. In 1954 two such summer sessions of six weeks each were conducted, the first session beginning June 21, and the second beginning August 2. Information concerning the Summer Sessions of 1955 will be published in the SUMMER SESSIONS bulletin, obtainable on or about April 1, 1955, upon request from the Office of the Summer Sessions, Room 1, Administration Building, University of California, Berkeley 4, California.

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

### UNIVERSITY EXTENSION

University Extension makes available the resources of the University to those, especially adults, who cannot take up residence at one of the campuses or who prefer a part-time special program. The program includes classes, correspondence courses, conferences and special activities in a wide variety of subject fields and interests. During the past few years an increasingly large and significant service has been made available to those in the professions and others with advanced training. Study at the professional level is offered in such fields as law, medicine, dentistry, accounting, public administration, and the like. However, the majority of University Extension offerings are in the more general fields and are open to intelligent men and women who can profit by the instruction.\*

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

Five principal methods of instruction are used:

(1) Classes are organized in cities and towns wherever there are a sufficient number of people 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 delivery.

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

Of particular note are expanding programs, utilizing the methods outlined above, in industrial relations, engineering, business administration, music, education, intensive language instruction, and 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 University Extension at any of the following addresses: University Extension, University of California, Berkeley 4; University Extension, University of California, Los Angeles 24; University Extension, University of California, 906 Santa Barbara Street, Santa Barbara.

### THE UNIVERSITY LIBRARY

The Library on the Berkeley campus of the University of California consists of the General Library with its twenty-one branch libraries, about fifty departmental and special libraries, and some sixty staff and office collections. These groups, collectively known as the University Library, contain more than 1,900,000 volumes. Approximately 21,000 periodicals and serials are received currently.

\* For information concerning admission to the University through University Extension, see page 27.

The principal collection of the General Library is housed in the Main Library, consisting of the Charles Franklin Doe Library Building and the adjoining Library Annex. Centrally located, the Main Library supplies the basic library services on the Berkeley campus.

The twenty-one branch libraries are located near the departments which use them most: Architecture Library, Architecture Building; Astronomy Library, Leuschner Observatory; Biochemistry Library, Biochemistry and Virus Laboratory Building; Biology Library, Life Sciences Building; Chemistry Library, Gilman Hall; City and Regional Planning Library, City and Regional Planning Building; East Asiatic Library, Durant Hall; Engineering Library, Engineering Building; Forestry Library, Forestry Building; Geological Sciences Library, Bacon Hall; Howison Memorial Library of Philosophy, Dwinelle Hall; Landscape Architecture Library, Agriculture Hall; Lange Library of Education, Haviland Hall; Library School Library, Main Library Building; Mathematics-Statistics Library, Dwinelle Hall; Matthew Memorial Library of Paleontology and Mineral Technology Library, both in the Hearst Mining Building; Music Library, Music Building; Optometry Library, Optometry Building; Physics Library, LeConte Hall; Public Health Library, Life Science Building.

The Bancroft Library of Californian, western American, and colonial Latin-American history is on the second floor of the Main Library.

The Alexander F. Morrison Library, housed in an attractively furnished room on the first floor of the Main Library Building, is an open-shelf collection of about 18,000 volumes for recreational reading. These books are available only to students and officers of the University for use within the Morrison Library room. The Bancroft Library and the Morrison Library are departments of the General Library.

Departmental and special libraries include the Law Library in the School of Law Building; Giannini Library in Giannini Hall, a collection of material in the field of agricultural economics for the special use of the students and staff of the College of Agriculture; the library of the Institute of Transportation and Traffic Engineering at the Richmond field station; and the libraries of the Bureau of Public Administration and the Bureau of International Relations, which have their own collections and reading rooms on the third floor of the Main Library.

Registered students may draw books and periodicals from the University Library, according to the regulations of the various units, by presentation of their registration cards as identification. Any borrower intending to leave the vicinity for more than four days is required to return, before he leaves, all books and periodicals charged to him, or to make such arrangements with the Library as will ensure their prompt return if needed.

# ADMISSION TO THE UNIVERSITY

## ADMISSION IN UNDERGRADUATE STATUS

AN APPLICANT WHO WISHES to enter the University must fulfill the general requirements for admission, as set forth below. Formal application must be filed with the Director of Admissions, 127 Administration Building, University of California, Berkeley 4. Application blanks will be supplied by the Office of Admissions 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 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. Every new student 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 the last 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 quality of scholarship in previous work, and second, that the study of certain specified subjects will give to the student both good preparation for the work of the University and reasonable freedom of choice of a major field of study after his entrance. These principles apply to admission in either freshman or advanced standing.

### Admission in Freshman Standing

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 page 00). 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 Admissions Office complete transcripts of record of all studies undertaken in those schools. Such transcripts must show that the applicant has graduated from an accredited\* high school. The Admissions Office will then evaluate the high school record, and the applicant will be eligible for admission if he qualifies under any one of the following methods. (There are additional requirements for out-of-state students, and for applicants to the College of Engineering. See page 29.)

\* 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 record of subjects completed and scholarship attained. The list of accredited schools is published by the University annually in the month of September. 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 director of Relations with Schools, Berkeley or Los Angeles. 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 Office of Admissions will, upon request, instruct the student regarding the procedure he should follow.

*Method I**Subject Requirements*

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

Additional elective units to complete the minimum of 15 standard entrance units.

*Scholarship Requirement*

An average of grade B, based on the marking system of four passing grades in the (a) to (f) subjects listed above, which are taken in the tenth, eleventh, and twelfth years.

Courses taken in the ninth grade or used as additional elective units need show passing grade only. A grade of A in one course will balance a C grade in another but will not balance a D grade. Courses completed after the ninth year in which a grade of D is received may not be counted either in reckoning the required scholarship, or in satisfaction of a subject requirement. Grades are considered on a semester basis, except from schools that give only year grades. Only courses used to meet the (a) to (f) subject requirements are used in computing the grade average. Courses taken in the tenth, eleventh, and twelfth years in which a grade of C or lower is received may be repeated to raise grades, when approved by the principal of an accredited high school, in an amount not to exceed two units of the (a) to (f) pattern. Only the first repetition of a subject will be used to satisfy scholarship requirements although additional repetitions may be allowed for the purpose of satisfying a subject requirement.

*Method II*

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.



**Method III**

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 courses such as physical education, study period, work experience, military science, R.O.T.C. and religion are *not* to be counted under this method.)

**Method IV**

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 courses such as religion, physical education, study period, work experience, military science and R.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.

**Method V. Experimental Plans of Admission:**

(a) 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 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.

(b) Experimental Plan of Admission (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.

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 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.

**Responsibility of High School Authorities**

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

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

### Preparation for University Curricula

In addition to those subjects required for admission to the University, outlined beginning on page 23, certain preparatory subjects are recommended for each University curriculum which, if included in the high school program, will give the student a more adequate background for his chosen field of study.

In some cases, lack of a recommended high school course will delay graduation from the University. Details of these recommendations will be found in the circular, PREREQUISITES AND RECOMMENDED SUBJECTS which may be obtained from the Director of Relations with Schools, Berkeley or Los Angeles.

Attention is directed to the fact that 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 at Berkeley, and thereby give the student greater opportunity in his freshman and sophomore years on the Berkeley campus to choose elective subjects.

Especial care should be exercised by the high school student in selecting a foreign language. The study of a foreign language is not only valuable as part of general education, but a reading knowledge of some foreign language will prove very useful in 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 at Berkeley; other languages satisfy only the (b) requirement.

### Admission by Examination

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

The University of California does not itself offer entrance examinations, but accepts on all campuses 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 9896, Los Feliz Station, Los Angeles 27, California, or P.O. Box 592, Princeton, New Jersey. Definite arrangements to take the tests must be made with the Board at least four weeks prior to the date of the tests. If the applicant has completed all of the subjects in the (a) to (f) list with grades of C or better, but is deficient in the scholarship average, he may clear his admission requirements by standard scores of 500 or above on the Scholastic Aptitude Test and on three achievement tests in subject fields. If the (a) and (f) list of subjects has not been completed with grades of C or better, the applicant should consult the Admissions Office in regard to the tests he must take. If the high school from which the applicant graduated was unaccredited he may offer an approved pattern of examinations. He should consult with the Admissions Office regarding the tests he must take.

### Removal of Admission Deficiencies

Deficiencies in high school scholarship or subject requirements must be removed by examination (see above) or additional studies before admission is approved. The applicant whose only deficiency arises from not having studied a required subject may remove the deficiency by a satisfactory grade in a course acceptable for that purpose. A satisfactory scholarship average must be maintained in other studies pursued in the meantime. The applicant whose deficiency is caused by a low scholarship average or by a combination of low

scholarship and incomplete subject preparation, may remove his deficiencies as follows:

1. By college courses of appropriate content and amount completed with satisfactory scholarship in junior colleges or state colleges of California, or in 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 higher, or
- (b) A minimum of 30 units of college transfer courses with a grade-point average of 1.3 or higher, or
- (c) A C average or higher on completion of all published requirements for junior standing in a college or school in the University.

Ordinarily, it is recommended that graduates of California high schools who are not eligible for admission to the University, attend one of the California junior colleges and complete there the lower division requirements of the college in which they wish to register. (See 5 below and the section on admission in advanced standing.)

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

- (a) *University Extension*: University Extension offers both class and correspondence courses. At Berkeley and at Los Angeles special programs of class courses are offered for students attempting to remove admission deficiencies. Only students with 5 units or less of scholarship deficiencies in their high school records are eligible for the special programs. Other courses, class or correspondence, are not restricted, but the applicant should have all courses he undertakes approved in advance by the Office of Admissions to insure that they will be acceptable. To make up deficiencies in scholarship, grades received in this program must be definitely above the grade C average, and must serve, not merely as specific make-up of deficiencies, but also as a demonstration of ability to do college work successfully.
- (b) *Combination Program of the College of Agriculture at the University of California, Davis*: For high school graduates with not more than three subject deficiencies among which may not be included algebra or plane geometry, a combination program is offered in the College of Agriculture of the University of California, Davis. See PROSPECTUS OF THE COLLEGE OF AGRICULTURE.
- (c) *Summer Session*: For students with only one or two deficiencies a six-week summer session or an eight-week summer session at the University of California or at 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 Office of Admissions.

3. By College Entrance Examination Board examinations (see section on Admission by Examination).

4. By postgraduate courses in accredited high schools.

5. As an alternative to making up high school subject deficiencies, an applicant may be admitted on the basis of a record showing completion of at least 60 units of C average work or higher, in which must be included all of 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 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 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, above.

As an integral part of the system of public education of California, the University of California accepts at full value approved transfer courses completed with satisfactory grades in the public junior colleges of the State; students who intend to complete their advanced studies at the University will frequently find it to their advantage to complete the first two years of their college course in one of the many excellent California public junior colleges.

An applicant may not disregard his college record and apply for admission in freshman standing; he is subject without exception to the regulations governing admission in advanced standing. He should ask the registrars of all preparatory schools and colleges he has attended to forward complete official transcripts directly to the Office of Admissions where he has filed his application. 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 toward 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. The decision as to their acceptability rests with the Office of Admissions. If such a program is planned with the intention of applying it toward a degree at the University of California, it is wise to have the approval of the Office of Admissions in advance.

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

Applicants otherwise eligible who seek to transfer from other institutions of collegiate rank but whose college records fail to show a satisfactory scholarship average may be admitted only when the deficiency has been removed by additional work completed with grades sufficiently high to offset the shortage of grade points. This may be accomplished by work in other approved higher institutions, in summer sessions, or by correspondence courses in University Extension. Applicants with scholarship deficiencies in college records are not usually admitted to the Admissions Program in University Extension.

### SPECIAL REQUIREMENTS FOR ENGINEERING

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

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

It has been necessary to place some limitation on the enrollment of non-residents of California and only those of exceptional promise will be eligible for admission. In addition to the normal admission requirements (see sections on Admission on the Basis of High School Records and Admission in Advanced Standing) the following special regulations 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:

A grade-point average of not less than 2.3 in the subjects required for admission, if taken in secondary schools accredited by a state university or a regional association; or

A grade-point average of not less than 2.5 in the subjects required for admission, if taken in secondary schools accredited by other agencies.

##### B. Advanced Standing:

A grade-point average 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 requirement 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 to take the CEEB test 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 to take the college level ACE Examination may be made either through the applicant's own school or through the Office of Admissions of the University of California. In contacting the Office of Admissions, 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 formal Application for Admission to the University has been filed.

*Upper Division:* Applicants from other states who present 60 or more semester units of advanced standing credit, according to the evaluation by the Office of Admissions are admitted under regular rules (see section on admission in advanced standing).

**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 whose high school subject deficiencies total not more than 3 units, are encouraged to make application even though they may not have all of the usual requirements. A veteran with a good scholarship record but with subject deficiencies, may be classified, if he is over 21 years of age, as a special student until deficiencies are removed, or until all of the requirements for junior standing in the college of his choice have been completed.

**ADMISSION OF SPECIAL STUDENTS**

Special students are students of mature years who have not had the opportunity to complete a satisfactory high school program, but who, by reason of special attainments, may be prepared to undertake certain courses in the University. The conditions for the admission of each applicant under this classification are assigned by the Director of Admissions. Ordinarily, a personal interview is required before final action can be taken 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. An applicant for special status may be required to take an aptitude test and the examination in Subject A. The Director of Admissions will supply, upon request, the forms of application for admission and for transcripts of high school record.

No person under the age of 21 years will be admitted as a special student, but 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 proper study-list officer, pursue elective or limited programs.

The University has no "special courses"; all courses are organized for regular students. A special student may be admitted to those regular courses for which, in the judgment of the instructor, he has satisfactory preparation. *A special student will seldom be able to undertake the work of the engineering and professional colleges or schools until he has completed the prerequisite subjects.*

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

### ADMISSION FROM SCHOOLS AND COLLEGES IN FOREIGN COUNTRIES

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

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

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

*College of Engineering.* An applicant for admission to the College of Engineering must pass with satisfactory scores the Scholastic Aptitude Test (verbal and mathematics sections) and the Preengineering Science Comprehension Test of the College Entrance Examination Board before a letter of admission to the College of Engineering may be issued. Arrangements to take the tests in another country may be made directly with the College Entrance Examination Board, Post Office Box 592, Princeton, New Jersey. A fee of \$12 is charged for these examinations and should be forwarded to the College Entrance Examination Board *not* the University of California. An applicant should also request that his scores in the tests be forwarded to the College of Engineering.

*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. Every student from another country is urged, upon his arrival at the University, to consult Mr. Allen C. Blaisdell, Foreign Student Adviser, International House.

### LATE ADMISSION AND REGISTRATION

The student or prospective student should consult the REGISTRATION CIRCULAR for the semester he plans to attend, and acquaint himself with the dates upon which students are required to register and file their study lists. Failure to register on the scheduled date will make it necessary for the student to seek special approval for late registration from the dean of his college, school, or the Graduate Division; such approval will be granted only when the student's reasons for lateness are acceptable to the dean.



*In no event will a student be permitted to register or file his study list after Friday of the sixth week of instruction.* If the student seeks to register in the fifth or sixth week, it will be necessary for him to obtain and deliver to the Registrar by Friday of the fourth week written authorization for admission, readmission, or continuation from the proper University officer.

A student will not be permitted to enroll in or attend classes unless he is currently registered or holds a temporary permit to visit classes. Undergraduates seeking permits to attend classes apply to the Director of Admissions; graduates to the Dean of the Graduate Division.

Every student who registers late in charged a fee of \$2 for lateness. Moreover, the late registrant is subject to unusual difficulty in arranging a suitable program of studies and may not plead lateness as an excuse if, subsequent to late registration, he is found to be deficient in his work.

### ADMISSION IN GRADUATE STANDING

Holders of the bachelor's degree from institutions of acceptable standing, representing the usual college course of four years, may, provided their scholarship is satisfactory, be admitted to the Graduate Division (Northern Section) of the University of California. Application for admission should be accompanied with official transcripts of record covering all college or university work completed, together with official evidence of the degrees conferred. The University of California may deny admission to graduate standing, however, if the scholarship record has not been satisfactory or if the undergraduate program has not been of such a character as to furnish an adequate preparation for advanced work leading to the academic or professional degree or certificate desired. This proviso applies to colleges and schools within the University of California as well as to those outside. *Registration will not in any case be permitted until all official records and official evidence of degrees conferred have been received.*

Transcripts of students' records and all other official credentials are retained permanently in the files of the office of the Dean of the Graduate Division. *The student must have an official transcript of his record (in addition to the record sent to the Dean of the Graduate Division) in his possession for conference with departmental advisers and for his own reference in planning a program of study. The Graduate Division office copy may not be borrowed for this, or for 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 of California. The application blank may be obtained by addressing the Dean of the Graduate Division, 102 Administration Building, University of California, Berkeley 4, and must be filed at the office of the Dean of the Graduate Division, preferably twelve weeks prior to the date of registration *and in no case later than July 15 for the fall semester and December 15 for the spring semester*; it should be accompanied by a money order or bank draft for \$5 in payment of every person who files an application, and is not returnable under any circumstances. (For readmission of former graduate students see below.) In cases where applications and complete records are filed later than twelve weeks before the date of registration, registration may be delayed, and the applicant made liable for the late registration fee of \$2.

Every new student must present at the time of his medical examination by

\* Veterans who expect to enroll under the provision of Public Law 346 (the G. I. Bill of Right) or Public Law 16 are not required to remit this fee with their applications. Persons governed by Public Law 550 ("Korean" G. I. Bill) must pay this fee from their allotment.

the University medical examiners, a certificate establishing the fact that he has been successfully vaccinated against smallpox within the last seven years. Vaccination should be completed prior to registration. A form for this purpose will be furnished by the University.

Applicants for admission to the graduate years in the School of Medicine should file their credentials with the Dean of the School of Medicine, University of California Medical Center, San Francisco 22, and should accompany them with a money order or bank draft for \$5 in payment of the application fee.\*

Applicants for admission to graduate work at Davis, the Lick Observatory on Mount Hamilton, the Hooper Foundation in San Francisco, the academic departments at the School of Medicine in San Francisco, the College of Dentistry and the College of Pharmacy in San Francisco must first secure admission to the Graduate Division and authorization to pursue work in these branches of the University from the Dean of the Graduate Division, Northern Section.

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

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

*Readmission.* An application for readmission is required of persons formerly registered as graduate students in a regular session who wish to return after an absence. The form for this purpose is obtainable from the Registrar, and no fee is charged. It should be filed with the Graduate Division at least two months before the opening of the semester in which the student wishes to be readmitted. Applicants for readmission must present at the time of the medical examination by the University Medical Examiners, a certificate establishing the fact that they have been successfully vaccinated against smallpox within the last seven years. Vaccinations should be completed prior to registration. A form for this purpose will be furnished by the University.

*Study Lists.* After admission to the Graduate Division every graduate student is required to file with the Registrar on a specified date a study list containing his program of courses (or statement of other graduate work, including thesis and research), approved by the graduate adviser in the department of his major subject. Study-list changes for graduate students are subject to the regulations applying to undergraduates.

For further information on all matters pertaining to the Graduate Division at Berkeley, see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, which is obtainable from the Dean of the Graduate Divisions, University of California, Berkeley 4.

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

\* Veterans who expect to enroll under the provisions of Public Law 346 (the G. I. Bill of Rights) or Public Law 16 are not required to remit this fee with their applications. Persons governed by Public Law 550 ("Korean" G. I. Bill) must pay this fee from their allotment.

## GENERAL REGULATIONS

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

### ROUTINE OF REGISTRATION

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

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

All students must register with the Registrar their choice of courses to be pursued in any semester, on blanks provided for the purpose, at the time and place designated. Registration at a later date requires special permission. For further information, see under Late Admission and Registration, page 00.

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

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

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

After the study cards are filed, students may make changes in their programs by formal petition, which must be approved by the instructors concerned and by the deans or other proper officers of the students' colleges.

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

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

### MEDICAL AND PHYSICAL EXAMINATION

All new students (graduate and undergraduate), just after filing their registration papers, must appear before the University Medical Examiners and pass a medical and physical examination, to the end that the health of the University community, as well as of the individual student, may be safeguarded. Every new student (graduate and undergraduate) entering the University must present at the time of medical examination by the University

medical examiner a certificate establishing the fact that the student has been successfully vaccinated against smallpox within the last seven years. Vaccination should be completed prior to registration. A form for this purpose is furnished by the University. Tests for tuberculosis are a part of the examination of all new students. Applicants for admission who have contagious diseases will be excluded. Those having physical conditions, such as convulsive seizures, which grossly disturb the classwork of other students, should not apply for admission.

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

Students returning after an absence must comply with the University requirements regarding smallpox vaccination and must have a health evaluation at the Student Health Service.

### STUDENT HEALTH SERVICE

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

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

During the semester, hospital care for a period up to thirty days may be given in the event of serious illness, on the recommendation of the University Physician. If at the end of the semester the patient is still ill he will be released from the hospital to the care of his home or community as soon as the University Physician considers it safe. Also, if injuries or illnesses are of a nature requiring long continued care which will obviously prevent the continuance in college in the current semester the patient will be returned to his community or home for definitive treatment. No surgical diagnostic procedures will be done (for example, tumors of the bone) where the procedure will prevent the student from returning to college the same semester or which may of necessity have to be followed by immediate definitive treatment where the student may not be returned to college. Charges will be made for unusual appliances or remedies not ordinarily available or for hospitalization in excess of thirty days.

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

Dental Service: The hours of 9 a.m. and 10 a.m. and 2 p.m. and 3 p.m. are

reserved for emergency dental examinations and treatments, X rays, and consultation. Emergency treatment of fractured jaws is also included in the service. After dental examination, appointments for general dentistry and cleaning are scheduled for the remaining time in accordance with a schedule of rates approved by the President of the University.

### PHYSICAL EDUCATION AND USE OF GYMNASIUMS

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

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

### SUBJECT A: ENGLISH COMPOSITION

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

The examination in Subject A is given at the opening of the fall and spring semesters (see the REGISTRATION CIRCULAR, to be obtained from the Registrar) and at the opening of each of the summer sessions. A second examination for late entrants is given not later than two weeks after the first examination in each semester; for this examination a fee of \$1 is charged.

The results of the first examination will be made known not later than the day preceding the date set for the filing of study cards for the current semester. Papers submitted in the examination are rated as either "passed" or "not passed." A student who is not present at the examination in Subject A which he is required to take will be treated as one who has failed. Every student who does not pass in the examination in Subject A must, immediately after his failure, enroll in a course of instruction, three hours weekly for one semester, known as the *Course in Subject A*, without unit credit toward graduation. Should any student fail in the course in Subject A he will be required to repeat the course in the next succeeding semester of his residence in the University.

A student who maintains in the course in Subject A a grade of A is permitted, on recommendation of the Committee on Subject A, to withdraw from the course at a date determined by that committee and is given credit for Subject A.

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

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

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

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

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

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

### AMERICAN HISTORY AND AMERICAN INSTITUTIONS

All students who are candidates for the bachelor's degree must demonstrate a knowledge of (1) American History and (2) the principles of American Institutions under the Federal and State Constitutions. Students may meet the requirements in the following ways:

1. By passing an examination in each of these subjects. The passing of these examinations will not entitle the student to receive unit credit.
2. By completing one course in each of the following groups:\*

- (a) *American History*: Economics 113, History 8B, XB8B (University Extension), 17A, 17B, XB17A, XB17B (University Extension), 167A, 167B, 170A, 170B, 171A, 171B, 172A, 172B, 173A, 173B, 173C, 174A, 174B, 175A, 175B, 176A, 176B, 177A, 177B, 187A, 187B.
- (b) *American Institutions*: American Institutions X7ABC or X7AB (University Extension), Political Science 1, XB1 (University Extension), 100A, 101A, 102A, 104A, 105A, 157A, 157B, 163, Speech 137.

Any one of the above courses offered in the Summer Session is acceptable. It is permissible to meet one requirement by completing one of the approved courses, and the other requirement by passing the examination in that subject. Students who have met the former combined American History and Institutions requirement prior to the opening of the fall semester, 1953, will not be held to meet the above revised requirements.

3. (a) By automatic equivalence granted for courses offered by collegiate institutions within the State of California in those cases where an official transcript of record from such an institution indicates satisfaction of the requirements 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 in attendance at the University of California on student visas, who are candidates for the bachelor's degree, are advised to see the Supervisor of the American History and American Institutions Requirements early in their academic work at the University.

Further information regarding these requirements may be obtained from the Supervisor, Room 204, Building T-9. For office hours, see official announcements on campus bulletin boards.

\* 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.

### **THE RESERVE OFFICERS' TRAINING CORPS**

Under the Act of Congress establishing land-grant colleges, it is required that military training be included in the curricula. The Board of Regents of the University of California has therefore directed that every lower division male student, unless excused, must pursue a course of military training during his first two years of residence. This is in accordance with instructions contained in the CIRCULAR FOR NEW UNDERGRADUATES or announcements which may be posted on the University bulletin boards. Enrollment in the basic course of the Reserve Officers' Training Corps satisfies this requirement of the Board of Regents for first- and second-year undergraduate male students. At the University of California this military requirement is fulfilled by enrollment in the Department of Air Science and Tactics, the Department of Military Science and Tactics, or in the Department of Naval Science.

First-year students will be permitted to elect either Air Science or Military Science in accordance with their personal preferences and subject to quota limitations placed upon each department by the Department of Defense. First-year students interested in Naval Science see section on Naval Science.

Students must list the prescribed courses in military training on their study cards with other University courses. A petition for excuse from, or deferment of, military training 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 of military training, including a statement of grounds upon which students may be excused from this work, may be obtained from the Registrar.

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

The United States Government furnishes arms, equipment, uniforms, and textbooks for the use of all students enrolled in military training courses. Certain monetary advantages accrue to advanced course (third- and fourth-year) students. As described in the following sections, with the exceptions noted for the separate services, students who successfully complete the advanced course are eligible for a reserve commission in one of the Armed Forces of the United States. They are also eligible to be commissioned by the Governor of the State of California in the University Cadets.

#### **Air Science**

The mission of the Air Force Reserve Officers' Training Corps is to select and prepare students, through a permanent program of instruction at civilian educational institutions, to serve as officers in the Regular and Reserve components of the United States Air Force, and to assist in discharging, where necessary, any institutional obligation to offer instruction in military training. In the accomplishment of this mission, the A.F.R.O.T.C. has these general objectives: to select students for the advanced course, and when practicable for the basic course, who are potentially best qualified to serve as officers in the U.S.A.F.; to arouse in the students a desire to serve as officers in the U.S.A.F.; to develop in the students those attributes of character, personality, and leadership which are essential to an officer in the U.S.A.F.; and to provide the students with the knowledge and understanding which will enable them to serve as junior officers in the U.S.A.F.



With this mission and these objectives in view, the A.F.R.O.T.C. course of study has been divided into three phases: 1) the basic course, 2) the advanced course, and 3) summer camp. Drill, leadership, and other basic military training are common to all three phases.

The lower division (basic) course includes an introduction to aviation, fundamentals of global geography, international tensions and security organizations, military instruments of national security, and elements of aerial warfare.

The upper division (advanced) course is open to enrollment by students who have completed the basic course (or who have received credit in lieu thereof) and who have been selected for enrollment therein. Students selected for this course are those who have shown potential for leadership and command, whose aptitude insures their development into efficient officer material, and whose interest in becoming Air Force officers has been clearly demonstrated. Primary emphasis is given to the selection of students who are physically qualified for and desirous of flying training after graduation in order to qualify as aircrew members. The advanced course includes command and staff relationships, problem solving, oral and written communication, military justice, applied air science, navigation, meteorology, Air Force Base functions, management, military aspects of world political geography, military aviation and the evolution of warfare, and briefing for commissioned service.

The summer camp consists of a six-week program conducted on an Air Force Base between the junior and senior years. It is devoted to familiarization and firing of individual weapons, familiarization flying, field exercises, orientation in air base activities, and individual participation in various officer positions.

Successful completion of the advanced course and four years of education culminating in the award of a bachelor's degree qualifies the student for appointment as a Second Lieutenant in the Air Force Reserve, or a certificate of completion dependent upon quota limitations imposed at the time of graduation.

### **Military Science**

The mission of the Army Reserve Officers Training Corps is to produce junior officers who by their education, training, and inherent qualities are suitable for continued development as officers in the Reserve and Regular components of the United States Army.

The Army R.O.T.C. program consists of three phases: 1) the basic course, 2) the advanced course, and 3) summer camp. Military leadership is emphasized throughout the course. Instruction is given in subjects common to all branches of the Army. The complete course of instruction covers four broad and distinct areas of military knowledge and skill: American military history; operations, tactics, and technique; logistics and matériel; and schooling of the soldier and exercise of command.

The lower division (basic) course includes an introduction to the organization of the Army, a study of American military history, and basic military instruction.

The upper division (advanced) course is open to enrollment by students who successfully complete the basic course or who have received credit for military service in lieu thereof, and who have attained upper division standing in the University. In general, students selected for this course are those who have shown potentialities for leadership and command, and whose aptitude insures their development into efficient officer material. The advanced course includes instruction in tactics, communications, logistics, operations, military teaching methods, military administration, and personnel management. The summer camp consists of a six-week program conducted on an Army post. Its objective is to familiarize the student with Army life and to afford practical training not available at the University.



Successful completion of the Army R.O.T.C. course and four years' education of the college level, qualifies the student for appointment as a Second Lieutenant in the United State Army Reserve. Students who are designated Distinguished Military Graduates are given the opportunity of applying for commissions in the Regular Army.

### **Naval Science**

The mission of the Naval R.O.T.C. is to provide by a permanent system of training and instruction in essential naval subjects at civil educational institutions a course from which qualified officers may be obtained for the Navy and Marine Corps, and the Naval Reserve and Marine Corps Reserve.

Candidates for enrollment in the Contract Program of the Naval Reserve Officers' Training Corps will be selected by the chairman of the department of Naval Science. These candidates are in addition to the candidates entering from the competitive nation-wide examination, and will be accepted to the limit of the quota as established by the Navy Department. Applications will be accepted from entering students and from other students who will have a minimum of eight semesters of college work remaining on this campus, in the undergraduate field. The curriculum of the Naval Science Department includes 24 units of naval science studies in eight semesters; one course being taken each semester.

The first two years of study cover Naval Orientation, History and Weapons. Commencing with the third year, students have the option of the Supply Corps Course, leading to a commission as Ensign, Supply Corps, U.S.N.R.; the Marine Corps Course, leading to a commission as a Second Lieutenant, U.S.M.C.R.; or General Line Officers' Course, culminating in a commission as Ensign, U.S.N.R., with active duty preference aboard a Naval ship or flight training, leading to a designation as Naval Aviator. Award of these commissions is predicated on successful completion of the 24 units of Naval Science and all other requirements for a first bachelor's degree in certain fields of study. In addition, two hours of military drill or practical work per week are required each semester, and Naval R.O.T.C. students must complete such instruction in swimming as is necessary to enable qualification as a Navy first-class swimmer. Candidates must contract to fulfill all the requirements of the four-year Naval R.O.T.C. curriculum, without serious interference with or from other academic work required for the bachelor's degree.

For further information and application to the Naval R.O.T.C., due to limited quotas, students should consult the Chairman of the Department of Naval Science in Room 47, Gymnasium for Men, not later than the week before registration.

### **STUDY-LIST REGULATIONS**

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

The presentation of a study list by a student and its acceptance by the college is evidence of an obligation on the part of the student to perform faithfully the designated work to the best of his ability. Withdrawal from, or neglect of, any course entered on the study list, or a change in program without the formal permission of the dean of the college, makes the student liable to enforced withdrawal from the University, or to other appropriate disciplinary action.

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

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

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

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

*Other general requirements.*—The attention of the student is directed to further University regulations concerning the requirements in scholarship, and for candidacy for degrees. 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 the degree. For filing this announcement later than the appointed date, a fee of \$2 is charged. In 1954-1955 these dates are: Wednesday, September 29, for candidates who expect to complete their work in January, 1955, and Thursday, February 24, for candidates for graduation in June, 1955.

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

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

### **CHANGE OF COLLEGE OR MAJOR**

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

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

### **HONORS**

Honor students include those who receive honorable mention with the degree of Associate in Arts in the College of Letters and Science, or upon attaining junior standing in the colleges of Agriculture, Architecture, Chemistry, and Engineering, or in the schools of Business Administration, Criminology, For-

estry, Nursing, Optometry, and Public Health. Honors are granted also with the bachelors' degrees. For regulations concerning honors see the sections explanatory of the curricula of the various colleges, in later pages of this bulletin.

### CREDIT AND SCHOLARSHIP

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

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

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

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

The value of a course in units is reckoned at the rate of one unit for three hours' work per week per semester on the part of the student. The credit value assigned to a course is not determined by the number of class meetings per week, but by the number of hours of work required of the student. For most courses it is expected that the average student will spend two hours in preparation for one hour of lecture or recitation.

### GRADES OF SCHOLARSHIP; GRADE POINTS

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

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

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

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

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

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

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

For the grading system in the School of Medicine, see the ANNOUNCEMENT OF THE SCHOOL OF MEDICINE.

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

### MINIMUM SCHOLARSHIP REQUIREMENTS

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

#### **Colleges of Letters and Science, Agriculture, Architecture, and Pharmacy (on the Berkeley campus); also Schools of Business Administration, Criminology, Forestry, Nursing, and Public Health—**

*Probation.*—A student will be placed on probation

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

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

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

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

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

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

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

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

### **Colleges of Chemistry and Engineering—**

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

### **School of Optometry—**

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

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

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

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

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

### **Graduate Division—**

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

### **School of Medicine and the College of Pharmacy on the San Francisco campus—**

Matriculants in the School of Medicine or in the College of Pharmacy on the San Francisco campus who are pursuing all their work in that school or college are not subject to the foregoing regulations. For the rules governing scholarship requirements in the School of Medicine and in the College of Pharmacy on the San Francisco campus reference should be made to the ANNOUNCEMENT OF THE SCHOOL OF MEDICINE and the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY.

### CREDIT BY EXAMINATION

Provision is made whereby an undergraduate student in residence and in good standing may under certain conditions take examinations for degree credit either (a) in courses offered in the University, without formal enrollment in them, or (b) in subjects appropriate to the student's curriculum but not offered as courses by the University. The results of all such examinations, with grades and grade points, are entered upon the student's record in the same manner as for regular courses of instruction (see Grades of Scholarship, page 42). No fees are required.

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

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

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

### FINAL EXAMINATIONS

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

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

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

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

Reexaminations are permitted only for the purpose of raising grade E or X (not passed) to a passing grade. A student who received grade B, C, or D in any course is not allowed a reexamination for the purpose of raising the grade. Concerning methods of raising nonpassing grades to passing grades, see under Removal of Deficiencies, below.

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

### REMOVAL OF DEFICIENCIES

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

A student who receives a grade lower than C in a lower division course may, upon repetition of the course, receive the grade assigned by the instructor and grade points appropriate to that grade. The foregoing privilege does

not apply to grades received in upper division or graduate courses. A student who receives grade E or F in an upper division or graduate course may, upon successful repetition of the course, receive unit credit for the number of units passed, but ordinarily will not receive grade points. (For exceptions, see below.)

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

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

Any examination, term paper, or other exercise which the instructor may require of the student in order to raise grade E to a passing grade in a course is a "condition examination." For every such examination a formal permit, to be obtained in advance from the Registrar, must be shown to the instructor in charge of the examination; otherwise he will lack authority to consider and report upon the work submitted by the student. For every course in which a special examination is undertaken with a view to raising grade E to a passing grade, a fee of \$2 is charged. The fee for a permit for two or more special examinations of this type is \$3. There is no fee for a reexamination (final examination taken with the class), if the final examination is the only task required by the instructor for the purpose of raising grade E to a passing grade and if this final examination is taken with the class not later than the close of the next succeeding semester of the student's residence in which the course is offered. A form of petition for a special examination or for admission to an examination with a class, with instructions concerning procedure, may be obtained from the Registrar. Grade E in a course in which a final examination is regularly held can be raised to a passing grade only by passing a satisfactory final examination in the course.

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

A student who raises a grade E or F, incurred in an upper division or graduate course, to a passing grade by *successful repetition* of the course, and a student who raises a grade E, incurred in any course, lower division, upper division, or graduate, to a passing grade by *examination* or by performing other tasks required by the instructor (short of actual repetition of the course), shall ordinarily receive no grade points. An exception to this rule is permitted, however, when the deficiency consists solely in the *omission* of the

final examination or other required exercise on account of illness or other unavoidable circumstances, the student's performance in all other respects having been satisfactory. In such circumstances the student may petition to have that grade assigned which he would have received had the work been completed without delay, together with the appropriate number of grade points. His petition must set forth in detail the reasons for his failure to complete the course within the usual limit of time. The petition must be endorsed by the instructor concerned, and must be submitted for final approval as follows: by undergraduate students (except students in the College of Pharmacy), to the Dean of Students; by students in the College of Pharmacy, to the Dean of that College; by graduate students, to the Dean of the Graduate Division.

### TRANSCRIPT OF RECORD

Each student will be provided, upon request to the Registrar, with one official transcript (copy) of his University record, without charge. After the first request a minimum charge of \$1 is made for each additional transcript of record. Students who plan to enter the teaching profession or to seek other employment following graduation, should provide themselves with one or more transcripts of their records so as to be ready at all times to show official evidence of attendance at the University.

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

### LEAVE OF ABSENCE AND HONORABLE DISMISSAL

Excuses for absence from a class or classes because of extenuating circumstances are issued by the Dean of Students, on request. A *brief leave of absence* is issued in lieu of an excuse when the absence covers several days or a longer period of time.

It is the student's responsibility to notify the Registrar immediately in writing whenever circumstances prevent further class attendance. An undergraduate student who finds it necessary to withdraw from the University prior to the end of a semester will be granted an *indefinite leave of absence* or an *honorable dismissal* only upon the written approval of the dean of the school or college and the Dean of Students. Graduate students require the approval of the Dean of the Graduate Division. In addition, men who are receiving veterans' benefits or who have been deferred by Selective Service because of registration in the University must immediately upon ceasing class attendance report in writing or in person to the Supervisor of Special Services. Permission to withdraw from the University without scholarship penalty is usually not granted after the first few weeks of the semester except under unusual circumstances over which the student has no control.

An *honorable dismissal* or an *indefinite leave of absence* may be granted, upon written petition, at the close of any semester to a student in good standing. Students dismissed because of scholarship deficiencies, students on scholastic probation, and students under censure or suspension are not regarded as being in good standing.

An *honorable dismissal* or an *indefinite leave of absence* will not be granted during or at the close of a semester until all accounts due the University have been satisfactorily adjusted, and all University property returned (laboratory equipment, uniforms, gymnasium clothing and equipment, keys, books).

*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.



**STUDENT CONDUCT AND DISCIPLINE**

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

## MISCELLANEOUS INFORMATION

### SITE, CLIMATE, AND TRANSPORTATION

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

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

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

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

### EXPENSES OF STUDENTS

#### General Expenses and Fees

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

#### Principal Items of Expense Estimated for a College Year (Two Semesters)

Expense item	Minimum		Moderate		Liberal	
	Men	Women	Men	Women	Men	Women
Incidental Fee.....	\$ 84.00	\$ 84.00	\$ 84.00	\$ 84.00	\$ 84.00	\$ 84.00
Books and Supplies.....	40.00	40.00	48.00	48.00	60.00	60.00
A.S.U.C. Membership.....	15.00	15.00	15.00	15.00	15.00	15.00
Board and Room.....	*420.00	*460.00	700.00	700.00	900.00	1000.00
Miscellaneous (cleaning, laundry, drugs, etc.).....	75.00	100.00	100.00	150.00	200.00	200.00
Total.....	\$634.00	\$699.00	\$947.00	\$997.00	\$1259.00	\$1359.00

\* Minimum cost includes five hours work per week.

The question of expense while attending the University is of importance to every student. It is difficult, however, to give specific information about yearly expenditure. In a student body of some sixteen thousand members there are so many different tastes, as well as such a wide range of financial resources, that each student must determine his budget in keeping with his own needs and financial condition. It is possible to live simply, and to participate moderately in the life of the student community, on a modest budget. The best help the University authorities can offer the student in planning his budget is to inform him of certain definite expense items, and acquaint him with others that he will in all probability have to provide for.

*Incidental fee.*—The incidental fee is \$42 each semester, for both undergraduate and graduate students. This fee, which must be paid at the time of registration, covers certain expenses of students for use of laboratories and library books, for athletic and gymnasium facilities and equipment, for lockers, for registration and graduation, for counseling service, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service with the aid of the visiting staff at Cowell Memorial Hospital and not elsewhere. No part of this fee is remitted to those students who may not desire to make use of all or any of these privileges. Payment by check, draft, or money order must be for the exact amount of the fees, and should be made payable to The Regents of the University of California. If a student withdraws from the University within the first five weeks from the first day of registration for the semester, a part of the incidental fee will be refunded.

Students who are classified as nonresidents of the State are required to pay each semester, in addition to the incidental fee, a tuition fee of \$150. It is important for every prospective student to note carefully the rules governing legal residence in the University, which are stated on page 52. For conditions governing the commutation of the tuition fee for graduate students, see the ANNOUNCEMENT OF THE GRADUATE DIVISION.

*Fees in the professional schools and colleges.*—In the professional schools and colleges tuition and general expenses differ. Nonresidents of California enrolled in the School of Law pay a fee of \$192 a semester, which includes the incidental fee paid by all students.

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

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

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

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

*Other expenses.*—Books and stationery for a student in the liberal arts courses average about \$40 to \$60 a year. Books and special equipment for students in the preprofessional and professional schools cost from \$50 to \$200. Exact information on these items may be obtained by writing directly to the school or department. Women students taking physical education are required to buy shoes which cost about \$4. Students failing the required examination in Subject A must pay a fee of \$20 for the course in Subject A (see page 36).

Membership in the Associated Students of the University costs \$15 each

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

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

*Tuition.*—The University charges a tuition fee to every student who has not been a legal resident of the State of California for a period of one year immediately preceding the opening day of the semester during which he proposes to enroll. Such a student is classified as a nonresident. A student entering the University for the first time should read carefully the rules governing determination of residence, as quoted below, that he may be prepared, in the event of classification as a nonresident, to pay the required tuition fee. This fee must be paid at the time of registration. *The attention of all prospective students, especially those 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 the 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.* Every alien student shall be deemed to be a nonresident student unless he has been lawfully admitted to the United States for permanent residence in accordance with all applicable provisions of the laws of the United States.

Tuition in the academic colleges is free to students who have been residents of the State of California for a period of one year immediately preceding the opening day of the semester during which they propose to attend the University. Students who are classified as nonresidents are required to pay a tuition fee of \$150 each semester. This fee is in addition to the incidental fee. Exceptions will be limited to *graduates* students who are unable to devote more than half time to academic study 1) for reasons of health as certified by the Student Health Service, or 2) for reason of full-time employment in salaried positions as certified by a statement from the employer. Where exceptions are made on the foregoing bases, the student's program will be limited to 4 units of course work in the "200" series or the equivalent thereof, and the nonresident tuition fee will be \$75 a semester. Petition for half fee based on the above criteria must be submitted to the Office of the Dean of the Graduate Division; otherwise, all students are presumed to be full-time students, irrespective of the number of units for which they are enrolled. On the approval of the Dean of the Graduate Division, the nonresident tuition fee may be remitted in the case of graduate students in the academic departments who are admitted 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. See further the ANNOUNCEMENT OF THE GRADUATE DIVISION.

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

*The eligibility of a student to register as a resident student may be determined only by the Attorney for The Regents in Residence Matters.* Every entering student, and every student returning to the University after an absence is required to make a "Statement as to Residence" on the day of registration,

upon a form which will be provided for that purpose, and his status with respect to residence will be determined by the Attorney soon after registration. Old students are advised that application for reclassification as a resident student must be filed within ten days after regular registration; by late registrants, within one week after registration. Application for a change of classification with respect to some preceding semester will not be received under any circumstances.

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

### Rules Governing Residence

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

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

That every alien student who has not been lawfully admitted to the United States for permanent residence in accordance with all applicable provisions of the laws of the United States, or whose status, he having been so admitted, has been changed, is deemed to be a nonresident student.

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

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

### LIVING ACCOMMODATIONS

Advice and information about all types of living accommodations may be obtained from the Housing Office, Building Q, University of California, Berkeley 4, California. Lists of boarding and lodging houses that have been inspected and approved by the University are available for single men and women. This office also maintains card files of accommodations for single men, for single women, and for married students. These accommodations have not been inspected, and students must call in person at the Housing Office in order to make arrangements for rentals through the card file. The Housing Office maintains a waiting list for accommodations for married students in the University of California Village. Applications for these apartment units may be

made by calling in person or writing to the Housing Office. Information concerning the Richmond Federal Housing Authority will also be sent on request.

The price of room and board depends upon the type of accommodations desired. In the Residence Halls, owned and operated by the University, the estimated price is between \$335 and \$400 a semester. This price includes three meals per day. In the boarding houses for men, the price for a semester is between \$275 and \$345 a semester, and the boarding houses for women \$300 and \$400. The prices quoted for most boarding houses do not include the price of lunches and Sunday meals, which average \$125 to \$150 a semester. In cooperative houses for single men, the price is approximately \$200 to \$215 a semester plus five hours of work a week. In cooperative houses for single women, the price is between \$200 and \$225 a semester plus five hours of work a week. Rooms in private homes and apartments vary greatly in price depending upon size and location.

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

All undergraduate students will be required to file a residence card. No approval is required for the college residence of men students. New undergraduate women students who do not live in their own homes are expected to live in houses approved by the University. Every undergraduate woman must have the written endorsement of the Dean of Women for her college residence before she will be permitted to complete her registration. Every undergraduate woman under 21 years of age not living in an approved house must have not only the permission of the Dean of Women for her college residence, but also the permission of her parents or guardian, whose approval must be indicated by signature on the residence card provided at the time of registration.

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

University Residence Halls for women include Stern Hall and four of the seven Fernwald Halls; namely, Mitchell, Peixotto, Richards, and Oldenberg. Stern Hall is a gift of Mrs. Sigmund Stern; it accommodates 90 undergraduate women. The cost for room and board is \$400 for the semester, payable in five installments. The four Fernwald Halls accommodate 272 women. Three of the halls have 78 undergraduate women each, and one of the halls has 38 residents. The cost for room and board is \$335 for the semester, payable in five installments.

The University Residence Halls for men are Bowles Hall, accommodating 204 men, and the Smyth Association, which is a group of three halls—Cunningham, Cheney, and Freeborn, accommodating 200 men. Bowles Hall was given to the University as a memorial to Philip Ernest Bowles, member of the class of 1882 and for twelve years a Regent of the University. The cost for room and board at Bowles and Smyth is \$350 for the semester, payable in five installments.

Applications for residence in all of the University Halls will be available for the fall semester beginning on April 1, and for the spring semester beginning November 1. Completed applications should be returned as soon as pos-

sible after these dates. Applications are complete when they are accompanied by two letters of recommendation, one from an official of the school last attended, and a \$25 deposit. Reservations in the University Residence Halls will not be open to men or women intending to participate in rushing.

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

*Fraternities and sororities.* Membership in these organizations is by invitation. Men students who are interested in fraternity membership may submit their names and addresses to the Dean of Students either in person or by mail. From these, "rushing" lists will be compiled and distributed to each fraternity. The majority of the national sororities maintain chapters here, and there are also several local sororities and clubs. Women students who are interested in sorority membership may obtain general information by writing to the Dean of Women. Information about monthly rates, initiation and pledge fees of the fraternities and sororities may be obtained by calling in person at the Office of the Dean of Students, 201 Administration Building.

Students who anticipate living in fraternity or sorority houses during their first semester should make temporary living arrangements at hotels or with friends for the rushing period. Reservations in the University Residence Halls will not be made for men or women who intend to participate in rushing.

### BUREAU OF OCCUPATIONS

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

### STUDENT EMPLOYMENT

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

It is not often advisable for a student to undertake part-time employment until he has had opportunity to adjust himself to new surroundings, to establish sound habits of study, and to maintain a good scholastic standing, thereby building a foundation for the rest of his University course. By the end of the first semester the student should know the demands of University life and his own capabilities well enough to enable him to plan for subsequent semesters a program combining studies and work. A student in good health can, with reasonable diligence, carry a normal program of studies and give a maximum of twelve to eighteen hours a week to employment. The student who must be entirely self-supporting should plan to carry a limited academic program since the majority of part-time cash positions require from twenty to twenty-four hours of work a week and transportation time.

The undergraduate curricula are organized on the assumption that the student will give the major part of his time and attention to his studies. A student who is largely self-supporting must consider at the outset the possibility of taking more than the minimum number of semesters required to obtain a

degree, if he is to maintain his scholastic standing and his health and enjoy the advantages of University life. The student who is not physically strong and in good health should not attempt to be entirely self-supporting at the expense of health and academic standing.

There is a limited number of part-time cash jobs available to students, but it is not always easy to fit an academic schedule to the employer's needs. In most cases class schedules must be arranged before referrals for employment can be given. Men who have a limited amount of time available or difficult class schedules can often supplement their income by doing gardening and housework. There are many opportunities for men students to work in exchange for board, a type of employment which requires less rigid academic scheduling.

Women students can usually be placed in private homes to work eighteen hours a week in exchange for room, board, carfare, and \$10 a month. A limited number of such positions offer room and board and carfare only, in exchange for fifteen hours of work a week. Although experienced waitresses, expert typists and stenographers have less difficulty than the unskilled women students in securing permanent part-time cash jobs, there are not usually sufficient opportunities to provide immediate employment for all those who apply at the beginning of the semester.

#### **SENIOR AND ALUMNI EMPLOYMENT**

The Bureau of Occupations assists graduating seniors and alumni in finding permanent full-time employment in fields other than teaching. It is suggested that students discuss their career interests and employment plans with appropriate interviewers early in their final year at the University. Alumni are eligible to use the services of the Bureau for consultation and placement at any time.

### **BUREAU OF SCHOOL AND COLLEGE PLACEMENT**

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

#### **OFFICE OF TEACHER PLACEMENT**

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

The University reserves the right to recommend only those persons who are considered to be fully qualified. In every recommendation the aim is to keep in mind the best available persons, remembering candidates already employed as well as those who may be out of employment.

#### **COUNSELING CENTER**

Because the University is large and its program offerings diversified, special attention must be given to individual needs and capabilities if a student is to derive maximum benefit from the educational process.

Problems of study methods, reading, concentration, and the like, should not be allowed to interfere with a student's academic success. Nor should his efforts be misdirected simply because he lacks knowledge concerning the rela-



tionship of his individual aptitudes to specific occupational and training requirements in a given field.

The Counseling Center offers each student an opportunity to discuss his educational or vocational problems with professional counselors who are qualified to assist students in choosing appropriate educational and vocational goals. As part of its service the Counseling Center provides aptitude and psychological testing, as well as an extensive library of current occupational information. This special library of materials includes information on professional fields and specializations; occupational and job qualifications; training facilities; and the trends and opportunities for employment in a wide variety of occupations. No charge is assessed for any of these services.

Offices of the Counseling Center are in Building T-5, located just north of the Campanile. Appointments and inquiries should be made directly at Building T-5.

### **VETERANS INFORMATION**

Dean of Students—Special Services 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. On the Berkeley campus, this office is located at 2227 Union Street. Offices of the United States Veterans Administration are located as follows: Regional Office, 49 Fourth Street, San Francisco 3, California; Regional Office, 1380 South Sepulveda Boulevard, Los Angeles 25; Regional Office, 325 B Street, San Diego 1, California.

In order to enroll under the provisions of Public Law 346 (G. I. Bill) and obtain full veterans 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 Dean of Students—Special Services 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 transfer to another campus of the University within the jurisdiction of the same Veterans Administration Regional Office and with no change of objective (or degree) and whose training under Public Law 346 has not been interrupted in excess of four months, need present only a Veterans Transfer Notice from the last campus 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 any other institution; (4) he has last attended University Extension; or (5) he last attended a campus within the regional jurisdiction of a different Veterans Administration region, in which event the veteran should also request a transfer of his files to the proper regional office.

Information regarding educational benefits available from the State of California (CVEL) may be obtained from the State Department of Veterans Affairs located at 700 Capitol Avenue, Sacramento, California; or by writing either to 357 South Hill Street, Los Angeles, California; or 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 Administra-

tion a Certificate for Education and Training which should be filed with the Dean of Students-Special Services 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.

### SELECTIVE SERVICE

Matters relating to the deferment of students eligible under Selective Service are handled by Dean of Students-Special Services, 2227 Union Street. Certifications regarding enrollment, class standing and other pertinent information will be submitted to the student's Selective Service Board upon request. To be considered for deferment by Selective Service, the student must be pursuing a full-time course of instruction which for undergraduates consists of at least 15 units. This does not include non-credit courses such as Subject A. Students who plan to seek deferment continuously until qualified for the bachelor's degree should understand that present policies of Selective Service permit continuous deferment only through the eighth term of college residence, including not only the period of residence at the University of California but also all terms spent at junior colleges or other collegiate institutions. Students should plan course sequences for several terms ahead so that prerequisites for all desired advanced courses can be satisfied within the eight-term period. To qualify as a full-time graduate student, the student must be in residence, actually spend full time on his studies, and meet the criteria generally applied for normal progress toward the degree—i.e., two years or less for the master's degree and four years or less for the doctor's degree (including time spent working toward the master's degree, if taken). Students desiring deferment on the basis of enrollment in the University R.O.T.C. programs should consult the proper R.O.T.C. department.

### SCHOLARSHIPS, PRIZES, LOANS

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

*Scholarships and fellowships.*—A circular giving information about undergraduate scholarships may be obtained from the Committee on Undergraduate Scholarships, 201 Administration Building. Students who maintain an excellent scholarship standing are eligible to make application. Awards are made on the basis of scholarship, financial need, and character and promise. Holders of undergraduate scholarships must carry a minimum of 12 units a semester. Applications for scholarships must be filed with the Committee on Undergraduate Scholarships by mail or in person for the succeeding academic year (September through June), or either semester thereof, during the following periods: Applicants in residence at the University file applications between December 1 and January 10 (January 11 when January 10 falls on Sunday). Entering students file applications between December 1 and March 1 (March 2 when March 1 falls on Sunday). *Under no circumstances will applications be accepted after these dates.* Application forms are available in the office of the Committee on Undergraduate Scholarships, 201 Administration Building, each year from the beginning of the last week in November.

Information about fellowships for graduate students may be obtained from the Dean of the Graduate Division. Fellowships and graduate scholarships are ordinarily awarded as a mark of honor, on the basis of scholarship, not of need. The holders of fellowships or graduate scholarships are expected to de-

vote all their time to graduate study and research in the University. Applications for fellowships and graduate scholarships must be filed with the Dean of the Graduate Division not later than February 15, prior to the academic year in which the award is tenable.

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

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

# REQUIREMENTS IN THE SEVERAL COLLEGES, SCHOOLS, AND CURRICULA

## COLLEGE OF LETTERS AND SCIENCE

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

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

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

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

To safeguard this character of instruction in the College, there has been set up a Letters and Science List of Courses the educational values of which are

regarded as not dependent upon their vocational applications. Nearly all courses elected by the student must be chosen from this list.

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

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

### Faculty Advisers and Study-List Regulations

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

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

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

*Advisers for students entering with advanced standing.*—Students entering the College of Letters and Science after attendance at other institutions will report to faculty advisers if they are lower division students; upper division students receive advice concerning the major from the major adviser. Such students, however, frequently have problems unrelated to the major, and should call at the office of the Dean to confer about their problems concerning elective courses. Students undertaking the General (nonmajor) Curriculum should report to the adviser.

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

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

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

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

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

courses, of which at least 12 units must be in their major department or group major in this University.

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

### Lower Division Requirements

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

Certain of these requirements may be satisfied by courses taken in the high school. It is desirable that the student should so arrange his high school program as to reduce the required work in the fields of foreign language, mathematics, and natural science. This makes his program more flexible, gives him a greater freedom of choice, and prepares him to pass more quickly into advanced work or into new fields of study. The satisfaction of requirements in the high school does not, however, reduce the amount of work required in the University for the degree of Associate in Arts (60 units) or for the A.B. degree (120 units).

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

(a) *General University Requirements.*†

Subject A. (See page 36.)

Military science and tactics, 8 units. (See page 39.)

(b) *Foreign Languages.* At least 16 units in not more than two languages, with not less than 4 units in any one language. The first two years of high school work in a foreign language will be counted in satisfaction of four units of this requirement and each year thereafter as 4 units. Courses given in English by a foreign language department will not be accepted in fulfillment of this requirement. A student may satisfy this requirement either in whole or in part by giving such evidence of his proficiency in foreign language as may be authorized by the Executive Committee of the College.

(c) *Mathematics.* Elementary algebra and plane geometry.

(d) *Natural Science.* At least 12 units chosen from the following list:

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

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

Anthropology 1.

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

Bacteriology 1\*, 2\*.

Botany 1\*, 12, 16\*.

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

‡Geography 1.

\* Will be accepted as a laboratory course.

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

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

Geology 1 or 10, 3, 5.  
 Paleontology 1, 10.  
 Physics 2A-2B, 3A-3B\*, 4A-4B-4C†, 10.  
 Physiology 1, 1L\*.  
 Zoology 1A\*, 1B\*, 10.

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

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

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

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

#### *Group 1—English and Speech*

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

#### *Group 2—Foreign Languages*

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

Dutch: 1, 2.

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

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

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

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

Oriental Languages: 12, 13, 14, 9, 39, 7A, 107.

Portuguese: 1, 21, 122, 123.

Scandinavian: 1A-1B, 3A, 3B, 4, 101A-101B, 103A-103B.

Slavic Languages and Literatures: 1, 2, 5A-5B, 6A-6B, 10A-10B, 12A-12B, or 14A-14B, or any upper division year sequence.

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

#### *Group 3—Mathematics*

Any two of the following courses: C or high school trigonometry, 2, 3A or 11A or 16A, 3B or 11B or 16B, 10, 12.

\* Will be accepted as a laboratory course.

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

*Group 4—Social Sciences*

Anthropology 2A-2B.  
 Classics 10A-10B.  
 Economics 1A-1B.  
 \*Geography 1-2, 5A-5B.  
 History 4A-4B, 8A-8B, 17A-17B.  
 Political Science 1, 2.  
 Psychology 1A and 1B or 33.  
 Sociology and Social Institutions 1, 2.

*Group 5—Philosophy*

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

*Group 6—Fine Arts and Literature*

Architecture 5A, 5B, 5D.  
 Art 1A, 1B, 1C, 1D, 10.  
 Classics 34, 35, 37A, 37B.  
 English 30, 44A, 44B, 46A, 46B, 49.  
 French 39A, 39B, 39C.  
 German 39A, 39B, 39C, 39D.  
 Italian 39A, 39B.  
 Music 21A, 21B, 27A, 27B.  
 Slavic 30.  
 Spanish 39A, 39B, 39C, 39D.  
 Speech 2A, 2B.

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

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

*Honorable mention with the degree of Associate in Arts.*—Honorable mention will be granted with the degree of Associate in Arts to students who attain at least an average of two grade points for each unit undertaken. The list of students who receive honorable mention with the degree of Associate in Arts will be sent to the chairmen or study-list officers of departments before the beginning of the next semester. A student who gains honorable mention has thereby attained honors status for his first semester in the upper division.

**Upper Division Requirements**

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

1. The total number of units in college courses in the lower and upper divisions offered for the degree must be *at least* 120, of which at least 108 must be in courses chosen from the Letters and Science List of Courses (see page 77). Not more than 6 units of courses numbered in the 300 or 400 series will be

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



accepted toward the A.B. degree. No credit will be allowed toward the A.B. degree for work completed at a junior college after the student has completed 66 units toward the degree.

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

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

4. The requirement of American History and American Institutions must be completed by all candidates for the bachelor's degree. Students may complete this requirement by passing examinations in American History and American Institutions, for which no unit credit will be assigned; by completing certain courses; by automatic equivalence granted for courses taken at a collegiate institution in California where it is indicated on the student's official transcript from the institution that the requirement has been satisfied; or by presentation of a certificate of completion of acceptable courses at another collegiate institution (see American History and American Institutions, page 37).

5. At least 36 units of work chosen from the upper division courses named in the Letters and Science list (see page 77), with the exceptions noted, must be completed after the student has attained upper division standing.

6. Fulfillment of either A or B:

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

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

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

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

### **Majors for the A.B. Degree**

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

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

Special attention is directed to the courses listed as preparation for or prerequisite to the major. Usually it is essential that these courses be completed before upper division major work is undertaken. In any event, they are essential requirements for the completion of the major.

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

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

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

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

See further, under Study-List Regulations, page 40.

### Organized Majors and Professional Curricula

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

Detailed descriptions of the departmental programs designated below will be found under their respective departments under Courses of Instruction in the ANNOUNCEMENT OF COURSES. Descriptions of the group majors follow the list hereunder.

American Civilization	French
Anthropology	Geography
Art	Geological Sciences
Astronomy	Physics. See Geological Sciences
Bacteriology	German
Biochemistry	Greek. See Classics
Botany	History
Chemistry	International Relations
Child Development	Italian
Chinese. See Oriental Languages	Japanese. See Oriental Languages
Civilization of the Middle Ages	Journalism
Civilization of the Nineteenth Century	Labor and Industrial Relations
Classics	Latin. See Classics
Communication and Public Policy	Mathematical Statistics. See
Decorative Art	Mathematics
Dramatic Art	Mathematics
Dramatic Literature	Medical Sciences
East Asiatic Studies	Music
Economics	Near Eastern Languages
Education	Oriental Languages
English	Paleontology

Philosophy	Renaissance, The
Physical Education	Scandinavian
Physics	Sculpture
Physiology	Slavic Languages and Literatures
Political Science	Social Welfare
Premedical Curriculum. See Medical Sciences	Sociology and Social Institutions
Psychology	Spanish
Public Speaking. See Speech	Speech
Recreation	Wildlife Conservation
Regional Group Majors	Zoölogy

### Description of Group Majors and Curricula

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

#### AMERICAN CIVILIZATION

*Group Major Adviser:* Mr. JACOBSON.

*Preparation for the Major.*—Required: Economics 1A-1B, English 1A-1B or Speech 1A-1B, History 4A-4B, Political Science 1-2. Students 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 American history, political science, economics, literature, philosophy, and the fine arts. The student will stress one of these fields, and conferences will be held to adapt the program to the student's particular needs. A comprehensive final examination to be taken at the end of the senior year will count for three of the 24 units. A student must maintain an average of 1.5 in courses of the major in order to continue in the major and must receive at least an average of 1.5 in the comprehensive final examination.

#### CHILD DEVELOPMENT

*Group Major Advisers:* Miss LANDRETH, Mr. VINCENT.

*Preparation for the Major.*—Required: Psychology 1A, Psychology 5 or Economics 2, Economics 1A; Physiology 1 and 1L. Recommended: Psychology 1B or 33, Anthropology 1, Economics 1B, Sociology 1 or 2.

*The Major.*—Required: Home Economics 111, 132, 135 and 138, Public Health 125, Psychology 113 and 161, Physiology 102. Recommended: Psychology 116, 117, 136, 165, Anthropology 118A and 118B, Home Economics 139.

Students interested in undertaking professional preparation as teachers, psychometrists, school psychologists, social welfare or public health workers, will be helped by consulting faculty advisers in the professional schools indicated as early as possible in their undergraduate career.

Students planning to continue in graduate work leading to the M.A. or Ph.D. degree in child development are advised to consider the course requirements for these degrees in planning their upper division program.

Freshman students interested in a child development major are advised to consider the merits of the major offered in the Department of Home Economics as well as the group major outlined above.

**CIVILIZATION OF THE MIDDLE AGES**

*Adviser:* Mr. WALPOLE.

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

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

*The Major.*—French 122A–122B; History 121A–121B; Italian 109A–109B or Italian 150A–150B; Art 175C (or, when this is not offered, 175A or 175B); a course in Medieval Thought such as History 125A–125B, or a suitable course in Medieval Philosophy. A minimum of 9 units selected from the following list: German 118A, 135A–135B; Spanish 107A, 112A; History 122, 123, 152; Classics 180B; English 151L, 155.

**CIVILIZATION OF THE NINETEENTH CENTURY**

*Adviser:* Mr. ROWBOTHAM.

*Preparation for the Major.*—Required: English 1A–1B, 46B; History 4A–4B; Philosophy 20A–20B; Economics 1A–1B; Art 1B or Music 27B or 21B. Recommended: English 41; French 39B; German 39C.

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

**COMMUNICATION AND PUBLIC POLICY**

*Advisers:* Mr. BARNHART, Mr. GRIFFIN, Mr. HEARN.

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

Students preparing for employment in propaganda analysis or related fields in governmental agencies are urged to discuss their lower division program with the advisers.

*Preparation for the Major.*—Required: English 1A–1B or Speech 1A–1B; Speech 10A, 12; Psychology 1A. Recommended: Economics 1A–1B; History 4A–4B, 17A–17B; Sociology and Social Institutions 1–2; Journalism 38; Psychology 5 or Economics 2.

*The Major.*—Required: 18 units from Journalism 141; Philosophy 108 or 104 or 128; Political Science 161A; Psychology 145; Speech 119; Speech 137 or 135 or 138; and 6 units from Anthropology 118A–118B, 120; Business Administration 150; Business Administration 163 or Psychology 180; Journalism 190; Political Science 161B or 162A or 160A or 160B; Psychology 105; Sociology and Social Institutions 104, 141A–141B, 175; Social Welfare 110A or 110B; Speech 132 or 133; Speech 117A.

**DRAMATIC LITERATURE**

*Group Major Adviser:* Mr. ULMAN.

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

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

*The Major.*—Thirty units, of which the comprehensive examination counts for 3 units. Required: English 114A-114B and one of the Shakespeare courses (English 117A-117B, 117E); Dramatic Art 160A-160B; 6 units selected from Philosophy 136A-136B-136C, 146, Dramatic Art 130, 135, 140A-140B.

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

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

Graduates in this major may continue work in this field for the master's degree, under the direction of the committee administering that degree in comparative literature. See under Comparative Literature in the ANNOUNCEMENT OF COURSES.

**EAST ASIATIC STUDIES**

*Advisers:* Mr. BINGHAM, Mr. EBERHARD.

The major is for those students who wish to gain an understanding of the life and civilization of East Asia in its totality, applying the techniques and becoming acquainted with the contributions of anthropologists, linguists, historians, political scientists, economists, sociologists, geographers and students of art.

Attention is called to the fact that students interested in the Far East may, if they wish, offer programs under the regional group majors on China, Japan, and Southeast Asia (see pages 73 and 74).

*Preparation for the Major.*—Required: Two of the following: Anthropology 2A-2B; Art 1D; Economics 1A-1B; Geography 1-2, 5A-5B; Oriental Languages 38A-38B; Political Science 1-2.

*The Major.*—Required: 24 units (which must include courses in five departments) from the following: Anthropology 115, 143A-143B; Classics 197; Economics 115, 190A-190B; Geography 125A, 125B; History 138A-138B, 192A-192B; Oriental Languages 142; Political Science 115A, 138B; Sociology and Social Institutions 166 and 167. Twelve additional units of upper division courses are required. A student is advised to concentrate his electives in courses applying to a particular area of East Asia, or to the courses of one particular department. If planning to continue on in graduate work, the student is advised also to take courses in a modern language of East Asia.

**INTERNATIONAL RELATIONS**

*Group Major Adviser:* Mr. HAAS.

*Committee in Charge of the Major:* Mr. CONDLIFFE, Mr. PALM.

International relations embraces those social relationships which transcend the boundaries of national states. The major in international relations is devised to meet the needs of students interested in acquiring an understanding of the forces and influences conditioning present-day world politics, as well as

the main problems and policies of organized states in their relations with one another in the twentieth century. These problems and policies must be dealt with and determined by governments, and consequently the major is built around courses dealing with intergovernmental legal, diplomatic, and economic relations. But the major cuts across departmental lines, for statesmen develop their policies in relation to geographic, economic, and social conditions, and in the light of historic policies. History reveals these traditional policies, regional geographic and anthropological studies provide an acquaintance with relevant physical and biological factors, and social psychology contributes to an understanding of nationalism and other phenomena in the field of study. Courses in other fields likewise make their contribution.

*Preparation for the Major.*—Economics 1A–1B; History 4A–4B, 17A–17B; Political Science 1, 2.

*The Major.*—Economics 190A–190B; Political Science 123, 124, 133A–133B; 6 units of history selected in consultation with the adviser. A minimum of 15 units (exclusive of the 4-unit beginners' course) in one of the following languages: French, German, Spanish; or 15 units in Russian, Chinese, Japanese, or Portuguese. With the consent of the major adviser Anthropology 118A–118B may be substituted for 6 of the 15 required language units. The language requirement may be met by passing a written reading test.

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

#### LABOR AND INDUSTRIAL RELATIONS

*Group Major Adviser:* Mr. Ross.

The purpose of this program of study is to give the undergraduate student a broad, nontechnical understanding of the problems of wage and salary earners and of managers, the role of employers and unions in our society, and the nature and implications of union-management relationships. The program is designed to meet the needs of students who have not decided upon specific vocational objectives or who do not wish to specialize to the extent of taking a departmental major, but who do desire a general orientation in this important area of social relations.

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

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

*The Major.*—Required: 36 units of upper division work as follows: (a) 24 units of background courses: Sociology and Social Institutions 141B, Anthropology 118B, Political Science 113, Psychology 145, Economics 113, Economics 121A, Business Administration 140, and one of the following—Philosophy 108, Economics 106A–106B, Political Science 100A and 150B, and Sociology and Social Institutions 132. (b) 12 units of specialized courses: Economics 150 or Business Administration 150; and 9 units selected from Business Administration 151, 152, 153, and for seniors who have met the requirements for admission to graduate courses, 256, Economics 152, 185, Mechanical Engineering 143, 146, Political Science 160A–160B, Psychology 185, 186, 187, 188, Sociology and Social Institutions 102, 161.

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

#### MEDICAL SCIENCES

Candidates for the degree of A.B. in the College of Letters and Science who plan to pursue the four-year curriculum leading to the M.D. degree in the 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 years of the College of Letters and Science. In order to do this the student should register as a premedical student on entering the College of Letters and Science. He should then fulfill the requirements for the degree of Associate in Arts, comply with the requirements in American History and American 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.

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.

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. 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; 18 units of a modern foreign language. Psychology 160, 168 and Public Health 160A, 160B are recommended strongly.

For further information concerning the School of Medicine, see the ANNOUNCEMENT OF THE SCHOOL OF MEDICINE, SAN FRANCISCO. See also page 134.

### Premedical Curriculum

Since it is possible under certain circumstances, as outlined above, to attain both the A.B. and M.D. degrees, 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.

<i>First Year</i>	<i>Fall</i> Units	<i>Spring</i> Units	<i>Second Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
*Subject A and American History and American Institutions .....	2	2	Military Science .....	2	2
Military Science .....	2	2	Zoölogy 1A-1B .....	4	4
Chemistry 1A-1B .....	5	5	Zoölogy 4 .....	2	2
†English 1A-1B or Speech 1A-1B .....	3	3	‡Foreign Language .....	4	4
‡Foreign Language .....	4	4	Year Course (See requirement (e) for degree of Associate in Arts) .....	3	3
Electives as necessary to make up units .....	..	3	Year Course (See requirement (e) for degree of Associate in Arts) .....	3	3
			Electives .....	1	..
	<hr/>	<hr/>		<hr/>	<hr/>
	14	17		17	18
			<i>Third Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
			Physics 2A-2B .....	3	3
			Physics 3A-3B .....	1	1
			‡Chemistry 5 .....	3 or 3	3
			‡Chemistry 8 .....	3 or 3	3
			Zoölogy 100 .....	4	..
			Electives .....	2 or 8	5 or 11
				<hr/>	<hr/>
				16	15

### Medical Sciences

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

*Adviser:* DR. FRANCIS S. SMYTH.

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

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

### PHYSICAL EDUCATION

*Group Major Advisers:* For women—Miss HODGSON, Miss COBB, Miss ESPENSCHADE. For men—Mr. HENRY, Mr. MILLER, Mr. STONE.

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

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

‡ Foreign Language: while 8 semester units in a modern language will be accepted by the School of Medicine as a "reading knowledge," it is a requirement of the College of Letters and Science that 16 semester units in not more than two languages be completed before entrance into the junior year in order that the student be eligible to receive the Associate in Arts degree or later to attain senior standing. Those students who have a bachelor's degree (or who will have prior to entrance to the School of Medicine) need meet only the School of Medicine requirement of 8 semester units in a modern foreign language.

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



*Preparation for the Group Major.*—High school chemistry or the equivalent, Public Health 5A (3), Physiology 1-1L (5), Psychology 1A (3), Zoölogy 1A (4) or 10 (3), Home Economics 10 (2); physical education activities (Physical Education 1 or 26) (2-4); for women—rhythmic basis of dance and allied arts (Physical Education 35) (2); introduction to physical education (Physical Education 20) (1); and first aid (Physical Education 5A) (1).

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

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

#### RECREATION

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

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

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

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

*The Group Major.*—Required: 6 units from each of two fields (economics, history, political science) and at least 3 units of social welfare, selected with the approval of the adviser; Physical Education 143A-143B, 144A-144B, and Philosophy 136A; 11 units in the field of specialization according to interest (art, dramatic art, music, physical education). The total group major program comprises 36 units of specified courses together with two summers' field work (or the equivalent) to be taken without credit.

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

#### REGIONAL GROUP MAJORS

The following group majors are designed to combine studies in the geography, history, government, and ethnography of an important region or country

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

### Regional Group Major on China

*Advisers:* Mr. BOODBERG, Mr. BINGHAM.

*Preparation for the Major.*—Required: 16 units of Chinese (minor short-ages may be made up in the upper division) and two of the following: Anthropology 2A-2B; Art 1D; Economics 1A-1B; Geography 1-2, 5A-5B; Oriental Languages 38A-38B or Political Science 1-2.

*The Major.*—Required: 24 units of which 8 to 12 units must be in upper division Chinese and the remainder must be selected from the following: Art 160A-160B; Economics 115; Geography 125B; History 193A-193B, 194A-194B; Oriental Languages 112A-112B; Political Science 135 and 143C. An additional 6 units are to be selected from courses dealing with China or the Far East.

### Regional Group Major on France and French Colonies

*Advisers:* Mr. FAY, Mr. PALM.

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

*The Major.*—Required: A one-year upper division course in French; Economics 112; Geography 123A; History 134A-134B, 144A-144B or 145 and 146. Recommended: French 101A-101B, 134A-134B; Education 105; History 141, 148; Political Science 123, 124, 125, 127, 129, 143D, 147A, 185.

### Regional Group Major on Germany and Central Europe

*Advisers:* Mr. SONTAG, Mr. JELAVICH.

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

*The Major.*—Required: A one-year upper division course in German; Economics 112; Geography 123A-123B; History 143A-143B, or 140A-140B; Political Science 147B. Recommended: German 112; History 144A-144B, or 145 and 146, or 136A-136B, or 140A-140B.

### Regional Group Major on Hispanic America

*Adviser:* Mr. MOSK.

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

*The Major.*—Required: Spanish 104A–104B or 6 units from Portuguese 21 or 123; History 161A–161B; Geography 122A or 122B; Anthropology 141 or 142. The remainder of the 30 units are to be selected from the following list of courses: Anthropology 105A, 105B, 161, 191; Political Science 148, 136A; Spanish 102, 113A, 113B, 114A, 114B; History 160A, 160B, 162, 163, 166A, 166B; Economics 114, 190A, 190B; or from additional courses not used in the required group.

### Regional Group Major on Japan

*Advisers:* Mr. LEVINSON, Mr. SCALAPINO, Mr. SHIVELY.

*Preparation for the Major.*—Required: 16 units of Japanese (minor shortages may be made up in the upper division) and two of the following: Anthropology 2A–2B; Art 1D; Economics 1A–1B; Geography 1–2, 5A–5B; Oriental Languages 32, 38A–38B or Political Science 1–2.

*The Major.*—Required: 24 units, of which 8 units must be in upper division Japanese and the remainder must be selected from the following: Art 162; Economics 115; Geography 125B; History 195A–195B; Oriental Languages 132; Political Science 145. An additional 6 units are to be selected from courses dealing with Japan or the Far East.

### Regional Group Major on Russia and Eastern Europe

*Advisers:* Mr. MASLENIKOV, Mr. KERNER.

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

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

*The Major.*—Required: 24 units comprising the following: Russian 103A–103B; History 135A–135B, or History 136A–136B; Geography 124; Political Science 141; two of the following—Slavic Languages 130, 180A or 180B; History 137A–137B. Recommended: Economics 110, 112, 190A–190B, 197; History 138A–138B, 139A–139B, 140A–140B; Political Science 131A; Slavic Languages and Literatures 131, 132, 152, 134, 138, 133A–133B.

### Regional Group Major on Southeast Asia

*Advisers:* Miss HAAS, Mr. GIFFORD.

*Preparation for the Major.*—Required: (emphasis on Indonesia) 6 units of Dutch and 3 units of Indonesian; or (emphasis on continental Southeast Asia) 16 units of French. In addition, all students, regardless of emphasis, are required to take any two of the following courses: Anthropology 2A–2B; Economics 1A–1B; Geography 1, 2 or Political Science 1, 2.

*The Major.*—Required: (emphasis on Indonesia) Anthropology 115; or (emphasis on continental Southeast Asia) Oriental Languages 174A–174B and Anthropology 143. In addition, all students, regardless of emphasis, are required to take Geography 125A and 21 units from courses dealing with Southeast or South Asia, selected in consultation with the adviser. Recommended: Near Eastern Languages 125 and Sanskrit 190A–190B.

### RELIGION

Students interested in the study of religion, either from the standpoint of liberal education, or of preparation for the ministry or some other phase of religious education, may select a major in one of the departments germane to

the purposes of the student, or they may propose an individual group major (see page 66), or they may elect a suitable combination of courses under the general curriculum (see page 59).

Courses appropriate for such purposes may be found in a number of departments such as Anthropology, Classics, Economics, Education, English, History, Oriental Languages, Philosophy, Psychology, Semitic Languages, Sociology and Social Institutions, Social Welfare. Particular attention is directed to the following courses: History 122, 131A-131B; Near Eastern Languages 100A-100B, 102A-102B; Philosophy 104, 112.

#### THE RENAISSANCE

*Group Major Adviser:* Mr. CLINE.

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

*Preparation for the Major.*—Required: English 1A-1B, 46A; History 4A; Philosophy 20A-20B. Recommended: A reading knowledge of Latin, French, German, Spanish, or Italian.

*The Major.*—Required: Art 176; English 117A, 117B, or 117E, 158A; History 131A; Italian 151; Classics 178; and 6 or more units from the following: Classics 180B; French 109A; German 118B; History 131B; Philosophy 115, 116; Political Science 118A; Spanish 107A-107B, 111.

#### SCULPTURE

*Group Major Adviser:* Mr. NOVAK.

*Committee in Charge of the Major:* Mr. NOVAK, Mr. O'HANLON, Mr. PEPPER, Mr. SCHNIER, Mr. WELLINGTON.

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

*Preparation for the Major.*—Architecture 14A-14B (2-2), Art 2A-2B (2-2), or equivalent at the discretion of the instructor and 6 units from Art 1A, 1B, 1C, or 1D. The choice of alternates should be made in consonance with upper division courses. Recommended: Architecture 1N (3), 2N (3), Art 3A (2), 3B (2), 10 (2); Decorative Art 6A (2), 6B (2). The recommended courses may be actually required as prerequisites for upper division courses included in the major.

*The Major.*—Twenty-four units of upper division work including Architecture 140 (2), 142 (2), 143 (2), 148 (2); Art courses from Group C (3), Decorative Art 180A (3), Philosophy 136A (3), and additional courses chosen from the following list to aggregate at least 7 units: Architecture 112 (1), 141 (2), 142 (2), 149 (2); Art courses from Group A (2), Art courses from Group C (2 or 3); Decorative Art 166 (3); Decorative Art 180B (3); Philosophy 136B (3).

The attention of the student is directed to the following courses as important and recommended in relation to certain aspects of their field: Architecture 121, 122, 124, 125, 127, 129; Art courses in Group B; Decorative Art 127A, 127B, 127C; Philosophy 136C.

#### SOCIAL WELFARE

*Group Major Adviser:* Mr. FRIEDLANDER.

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

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

*Preparation for the Major.*—Required: Economics 1A–1B; Psychology 1A, 33; Economics 2 or Psychology 5; and 6 units selected from History 4A–4B, Anthropology 2A–2B, Sociology and Social Institutions 1–2, Physiology 1, Zoölogy 10.

*The Major.*—Required: 36 units of upper division work, including (a) the following courses, to the value of 9 units: Social Welfare 102, 110A–110B; and (b) 27 units selected from the following courses (with the permission of the faculty adviser and to meet the specific needs of individual students, some upper division courses may be substituted): 6 units from Home Economics 132, Physiology 102, Psychology 160, 162, 165, 168; 3 units from Economics 130A, Political Science 102A, 103A, 175, 181; 9 units from Social Welfare 106, Anthropology 118A–118B, Economics 106A–106B, Economics 150 or Business Administration 150, Economics 180, Psychology 145, Sociology and Social Institutions 148; 9 units from Architecture 117, Criminology 100A–100B, Economics 185, Physical Education 140, Public Health 106, Social Welfare 108, Sociology and Social Institutions 161.

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

Students who have completed the major successfully, and who have established their eligibility for admission in full graduate standing, will have fulfilled the educational requirements for admission to the School of Social Welfare, as well as the prerequisites imposed by practically all other accredited schools of social work. Admission to the graduate school of Social Welfare at Berkeley will depend upon an evaluation of the total application which includes personal aptitude as well as academic qualifications.

#### WILDLIFE CONSERVATION

*Group Major Adviser:* Mr. LEOPOLD.

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

Training in this curriculum meets the minimum requirements for various positions as fish or game managers or as wardens with such federal agencies as the Fish and Wildlife Service, Park Service, Forest Service, and Soil Conservation Service, and with state agencies such as the divisions of Fish and Game, Forestry, and Public Health. Likewise certain beginning positions as field or laboratory biologists are open to the recipient of the A.B. degree.

To become adequately prepared as a professional fish or game biologist, however, the student should pursue further study leading to the M.A. or Ph.D. degree. The same is true of students who may wish to teach biology and con-

servation in high schools or junior colleges. The higher degree may be taken in the Department of Zoölogy at Berkeley or at some other university.

At least a 1.5 grade-point average must be maintained in all *required courses* in the curriculum.

*Preparation for the Major.*—Lower division. Required: Botany 1; Chemistry 1A and 8; Engineering 1A or 21; English 1A-1B; Geology 1; Mathematics C or 3A; Public Health 160A or Economics 2 or Mathematics 12; Speech 2A-2B; Zoölogy 1A-1B. Recommended: Agricultural Economics 1; Economics 1A-1B; Forestry 1; Geography 1 or 4; Physics 2A-2B, 3A-3B; Physiology 1-1L; Soils 10.

*The Major.*—Required: Biochemistry 102; Botany 108; Forestry and Range Management 101 (formerly Forestry 101) and Forestry 103; Entomology 100 or 133; Zoölogy 111 or Entomology 117; Zoölogy 113, 116 and 125; Zoölogy 138 or 145. Recommended: Botany 151; Forestry 125, 104, 108; Geography 153; Physiology 100A or 100B; Range Management 102 (formerly Forestry 102); Soil Science 100 or 101 or 116; Zoölogy 100, 106, 114, 125C.

#### LETTERS AND SCIENCE LIST OF COURSES

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

Courses not on the List, but taken for credit to satisfy a general University requirement established by the Board of Regents, will be accepted as equivalent to courses in the Letters and Science List up to a maximum of eight units.

Any course not included in the Letters and Science List of Courses, but required, or accepted, as part of a major or group major or as a prerequisite therefor, shall, for students offering that major or group major at graduation, but for no others, be treated as if it were in the Letters and Science List of Courses.

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

- |   |  |
|---|--|
| Agricultural Economics 112A, 112B, 120.   | Classics. All undergraduate courses.   |
| Anatomy. All undergraduate courses.   | Comparative Literature. All undergraduate courses.                           |
| Anthropology. All undergraduate courses.  | Decorative Art. All undergraduate courses.                                   |
| Architecture 5A, 5B, 5C, 5D, 14A, 14B, 117, 121, 122, 140, 141, 142, 143, 146, 148, 149.                              | Disaster Medicine 121A, 121B (formerly Medico-Military Science and Tactics.) |
| Art. All undergraduate courses.   | Dramatic Art. All undergraduate courses except 190, 191, 192, 193.           |
| Astronomy. All undergraduate courses except 3 and 11.   | Economics. All undergraduate courses.  |
| Bacteriology. All undergraduate courses.  | Education 108, 110 and not more than 3 units from 101, 102, 105.             |
| Biochemistry. All undergraduate courses.  | English. All undergraduate courses.  |
| Botany. All undergraduate courses except 155.   | Entomology 100, 106, 110, 112, 117, 119, 126, 127, 129, 131, 133.            |
| Business Administration 1A, 1B, 10, 18, 100, 150.   | Forestry 1, 103, 122, 125.   |
| Chemistry and Chemical Engineering. All undergraduate courses except 143, 144, 145A, 145B, 146A, 146B, 147, 149, 152. | French. All undergraduate courses except 20.                                 |
| City and Regional Planning. All undergraduate courses.  | Genetics. All undergraduate courses.   |
|   | Geography. All undergraduate courses.  |
|   | Geological Sciences. All undergraduate courses.                              |

- German. All undergraduate courses.
- Greek. All undergraduate courses.
- History. All undergraduate courses.
- Italian. All undergraduate courses.
- Journalism 120A, 120B, 140, 141, 190, 195, 199.
- Latin. All undergraduate courses.
- Linguistics. All undergraduate courses.
- Mathematics. All undergraduate courses except 7, 107, 142A, 142B, 142C, 142D, 144.
- Music. All undergraduate courses; a total of not more than 8 units from the following courses will be accepted as Letters and Science credit: 43, 48, 143, 148.
- Near Eastern Languages. All undergraduate courses.
- Optometry (see Physiological Optics, below).
- Oriental Languages. All undergraduate courses.
- Paleontology. All undergraduate courses.
- Philosophy. All undergraduate courses.
- Physical Education 105.
- Physics. All undergraduate courses except 125, 128, 131.
- Physiological Optics 105A, 105B, 106A, 106B.
- Physiology. All undergraduate courses.
- Plant Biochemistry 123.
- Plant Nutrition 115, 117.
- Political Science. All undergraduate courses except 183.
- Psychology. All undergraduate courses except 3, 104, 114, 116, 117, 180, 185, 186.
- Public Health 5A, 5B, 35, 106, 160A, 160B, 163.
- Sanskrit. All undergraduate courses.
- Scandinavian. All undergraduate courses.
- Slavic Languages and Literatures. All undergraduate courses.
- Social Welfare 100, 106, 110A, 110B.
- Sociology and Social Institutions. All undergraduate courses.
- Soil Science 110, 111, 112, 113, 114.
- Spanish and Portuguese. All undergraduate courses.
- Speech. All undergraduate courses.
- Zoology. All undergraduate courses except 109, 116, 119A-119B, 120A-120B, 145.

#### HONORS

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

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

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

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

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

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

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

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

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

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

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

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

### Honors with the Bachelor's Degree

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

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

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

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

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



### COLLEGE OF AGRICULTURE

The prospective student should read the requirements and recommendations for admission on pages 23-33. Entrants will be seriously handicapped in undertaking most of the lower division courses required in the various curricula of the College of Agriculture unless they have completed as a part of or in addition to those subjects required for admission, the following subjects in high school: algebraic theory,  $\frac{1}{2}$  or 1 year; trigonometry,  $\frac{1}{2}$  year; physics, 1 year; and chemistry, 1 year. Students proposing to major in agricultural engineering, forestry, irrigation science, landscape architecture, or range management should have in addition 1 year 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.

The first two years of all curricula (pages 87-89) offered by the College of Agriculture may be undertaken on the Berkeley campus. Several majors, however, must be completed at Davis or Los Angeles. Detailed information concerning curricula and instruction may be found in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, obtainable without charge, from the Dean of the College of Agriculture, University of California, Berkeley 4, California.

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

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

1. Satisfy the general University requirements as follows:

- (a) *Subject A.*—The Subject A examination in English composition is required of every undergraduate student at the time of his first registration in the University (see page 36).
- (b) *Air, Military or Naval Science (for male students)* (see page 38).
- (c) *American History and American 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 (see page 37).
- (d) *Residence in the University during the senior year* in the college in which the degree is to be taken.
- (e) *Attain at least as many grade points as units of credit* in courses undertaken at this University.

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

- (a) *At least 124 units of University work.* Not more than 4 units may be in lower division physical education courses.
- (b) *Thirty-six units of the above total must be in upper division courses* (courses numbered 100-199).
- (c) *Nine units of mathematics.* 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. The student normally satisfies this requirement before the end of his sophomore year at the University.

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

- (a) CURRICULUM IN AGRICULTURAL ECONOMICS

Bacteriology, botany, chemistry, geology, physics, physiology  
or zoölogy (including at least 5 units of chemistry and 3  
units of physics) ..... 18 units  
\*Mathematics (analytic geometry and calculus) ..... 6

\* Mathematics beyond this requirement may be used in partial fulfillment of the physical and biological science requirements.

English or speech .....	6
Principles of economics .....	6
Accounting .....	3
Statistics .....	3
Anthropology, geography, history, philosophy, political sci- ence, psychology, or sociology and social institutions.....	12
Agriculture (other than agricultural economics).....	8
Military science .....	8
	<hr/>
	70 units

(b) In addition to the above, all majors must complete at least 18 units of upper division work in agricultural economics, including courses 100A, 100B, and 106.

(a) CURRICULUM IN AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE \*

Chemistry .....	13 units
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
Military science .....	8
	<hr/>
	58 units

(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 for the agricultural education and general agriculture majors. See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE or the GENERAL CATALOGUE, DAVIS CAMPUS.

CURRICULUM IN AGRICULTURAL ENGINEERING

The Curriculum in Agricultural Engineering is offered in the College of Engineering. See page 102.

(a) CURRICULUM IN ANIMAL SCIENCE

Chemistry and/or biochemistry.....	16 units
Botany .....	4
Physics .....	6
Economics .....	3
English and/or speech .....	6
Genetics .....	4
Bacteriology .....	4
Animal nutrition .....	3
Animal physiology .....	5
Animal pathology, parasitology, or additional zoölogy.....	3
Zoölogy .....	10
Military science .....	8
	<hr/>
	72 units

(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, animal physiology, poultry husbandry, and genetics.

Certain courses are required by the four majors. See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE or the GENERAL CATALOGUE, DAVIS CAMPUS.

(a) CURRICULUM IN ENTOMOLOGY AND PARASITOLOGY

Chemistry .....	13 units
Agriculture and/or forestry, other than entomology and parasitology .....	3
Botany and zoölogy .....	20
Bacteriology .....	4
English and/or speech .....	6
Genetics .....	3
Physics .....	3
Plant or animal physiology or nutrition or biochemistry..	3
Plant or animal pathology .....	3 or 4
Geography, geology, or paleontology.....	3
Military science .....	8

69 or 70 units

(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.)

(d) In addition to (b) and (c) above, students must have one course in high school or college trigonometry.

(a) CURRICULUM IN FOOD SCIENCE

Chemistry .....	19 units
Microbiology .....	8
Botany or zoölogy .....	5 or 3
Physics (including laboratory).....	8
Biochemistry and/or physiology .....	6
Mathematics (including differential calculus).....	6
Speech and/or English .....	6
Economics .....	6
Military science .....	8

72 or 70 units

(b) Six units of course work in production fields of agriculture are required, and 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 three majors. See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE or the GENERAL CATALOGUE, DEPARTMENTS AT DAVIS.

## (a) CURRICULUM IN PREFORESTRY\*

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

(b) For admission to the School of Forestry, a student must have junior standing with at least 60 units of credit, including essentially the prescribed subjects listed above, a grade average of C or higher. The summer field practice course, Forestry 49, is prerequisite to all required forestry courses.

## (a) CURRICULUM IN HOME ECONOMICS

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

(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.)

Required courses for each of the majors are as follows:

*General Home Economics Major* (may also be completed at Davis):

Home Economics 1A, 1B, 6, 7, 112A, 112B, 132 (or Psychology 112), 133 or 135, 140, 141 or 142, 144, 162, 175; Decorative Art 6A, 6B, 130A, Architecture 110.

*Child Development and Family Relationships Major:*

Home Economics 1A, 1B, 112A, 112B, 132 (or Psychology 112), 135, 137 or 138, 435; Psychology 160, 161; Physiology 102, or Home Economics 134; Public Health 125.

*Clothing and Textiles Major:*

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

\* More detailed information concerning the School of Forestry is contained in the ANNOUNCEMENT OF THE SCHOOL OF FORESTRY, which is available without charge from the School of Forestry, University of California, Berkeley. Also see statement concerning School of Forestry, page 127.

† This requirement is based on Botany 1 as given at Berkeley.

**Family Economics Major:**

Home Economics 1A, 1B, 6, 100, 140, 141, 142, 144, 162; 3 upper division courses in economics or business administration selected upon consultation with the major adviser.

**Food Chemistry and Technology Major:**

Home Economics 1A, 1B, 100, 101A, 101B or 109, 114, 118A, 118B, 141 (or Business Administration 160); Chemistry 1B; Biochemistry 102; Physiology 1L; 3 units of food technology courses. Physics 2A, 2B, 3A, 3B, and Home Economics 12 are recommended electives.

**Nutrition and Dietetics Major:**

Home Economics 1A, 1B, 100, 101A, 114, 115, 118A, 118B, 141 (or Business Administration 160); Chemistry 1B; Biochemistry 102; Physiology 1L. Physics 2A, 2B, 3A, 3B, and Home Economics 12 are recommended electives.

**(a) CURRICULUM IN IRRIGATION SCIENCE**

Mathematics (including integral calculus) .....	6 units
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
Military science .....	8
	74 units

(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.

**(a) CURRICULUM IN LANDSCAPE ARCHITECTURE**

General botany .....	4 or 8 units
English or speech .....	6
*Art and architecture .....	27
Economics .....	6
Civil engineering (surveying) .....	3
Social institutions, history, philosophy, or political science..	6
Engineering (other than surveying), geology, mathematics or agriculture (other than landscape architecture).....	6
Military science .....	8
	66 or 70 units

(b) In addition to the above, students must complete a summer practice course (Landscape Architecture 49).

(c) Students must complete at least 30 units in landscape architecture selected with the approval of the major adviser. (Courses 1A, 1B, 101A, 101B, and 114A or 114B should be included.)

\* Courses in Decorative Art and City and Regional Planning may be accepted in partial fulfillment of this requirement with the consent of the student's adviser.

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

(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, floriculture and ornamental horticulture, genetics, general horticulture, landscape management, plant pathology, pomology, subtropical horticulture, 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 majors mentioned under (b) above. See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE for details.

(a) CURRICULUM IN RANGE MANAGEMENT	
Chemistry (general inorganic, organic) .....	8 units
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 improvement) .....	9
Forestry (forest ecology) .....	3
Soils (medium for plant growth) .....	4
Military science .....	8
	83 or 84 units

(b) In addition, students must take 9 units in range management courses selected with approval of the major adviser.

(c) In addition, a six weeks' summer course in applied range management is required without units of credit.

(d) Fifteen units must be elected from the list of restricted electives.\*

\* For the list of restricted electives, see the PROSPECTUS OF THE COLLEGE OF AGRICULTURE, or the GENERAL CATALOGUE, DEPARTMENTS AT DAVIS.

## (a) CURRICULUM IN SOIL SCIENCE

Mathematics (analytic geometry and calculus).....	6 units
Chemistry (including physical chemistry).....	19
Physics (including laboratory).....	8
Botany (including plant physiology).....	9
Plant nutrition.....	2
Bacteriology.....	4
Mineralogy.....	4
Economics, or economics and agricultural economics.....	6
Geology (including petrology).....	6
English and/or speech.....	6
Military science.....	8
	<hr/>
	78 units

(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.

## CURRICULUM IN PREVETERINARY SCIENCE\*

English composition and additional English or speech.....	6 units
Chemistry (general, inorganic, organic, and analytical).....	16
Zoölogy (including embryology).....	8
Physics (mechanics, heat, light, electricity).....	6
Restricted electives†.....	12
Military science‡.....	8
	<hr/>
	56 units

## Freshman and Sophomore Years

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

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

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

\* More detailed information concerning the School of Veterinary Medicine is contained in the ANNOUNCEMENT OF THE SCHOOL OF VETERINARY MEDICINE, which is available without charge from the Dean of the School of Veterinary Medicine, University of California, Davis, California, to whom specific questions should be directed.

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

‡ The military science requirement may be included in the 10 units of electives.

## AGRICULTURAL ECONOMICS

<i>Freshman Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Sophomore Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science .....	2	2	Military Science .....	2	2
Chemistry 1A, 8 .....	5	3	Agricultural Economics 25 ..	3	3
Economics 1A-1B .....	3	3	Business Administration		
English 1A-1B or Speech			1A or 10 .....	3	..
1A-1B .....	3	3	Economics 2 .....	..	3
Mathematics 16A-16B ...	3	3	Physics 2A-2B .....	3	3
Agricultural			Physics 3A-3B .....	1	1
Engineering 12 .....	..	2	Geology 1 .....	3	..
			Soil Science 10 .....	..	4
			Elective .....	3	..
	<hr/>	<hr/>		<hr/>	<hr/>
	16	16		15	16

## AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Military Science .....	2	2	Military Science .....	2	2
Chemistry 1A-1B .....	5	5	Physics 2A-2B .....	3	3
Botany 1 .....	5	..	Bacteriology 2 .....	..	4
English 1A .....	..	3	Economics 1A-1B .....	3	3
Agronomy 1 .....	3	..	Soil Science 10 .....	..	4
Agricultural			Zoölogy 1A .....	4	..
Engineering 12 .....	..	2	Chemistry 8 .....	3	..
Elective .....	..	3			
	<hr/>	<hr/>		<hr/>	<hr/>
	15	15		15	16

## ANIMAL SCIENCE

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

## ENTOMOLOGY AND PARASITOLOGY

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Military Science .....	2	2	Military Science .....	2	2
Chemistry 1A-1B .....	5	5	Zoölogy 1A-1B .....	4	4
Botany 1 .....	5	..	Entomology 100 .....	4	..
English 1A-1B or Speech			Chemistry 8 .....	..	3
1A-1B .....	3	3	Physics 10 .....	..	3
Geography 2 .....	..	3	Bacteriology 2 .....	..	4
Elective .....	..	3	Elective .....	6	..
	<hr/>	<hr/>		<hr/>	<hr/>
	15	16		16	16

## FOOD TECHNOLOGY

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Military Science .....	2	2	Military Science .....	2	2
Chemistry 1A-1B .....	5	5	Physics 2A-2B .....	3	3
Botany 1 .....	5	..	Physics 3A-3B .....	1	1
Vegetable Crops 1 .....	..	3	Chemistry 8, 5 .....	3	3
Speech 1A .....	..	3	Bacteriology 1 .....	5	..
Economics 1A .....	..	3	Mathematics 16A-16B .....	3	3
Elective .....	3	..	Economics 1B .....	..	3
			Speech 1B .....	..	3
	<hr/>	<hr/>		<hr/>	<hr/>
	15	16		17	18



## PREFORESTRY

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

## ‡HOME ECONOMICS

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

## IRRIGATION SCIENCE

<i>Freshman Year</i>		<i>Sophomore Year</i>	
Military Science . . . . .	2	Military Science . . . . .	2
Botany 1 . . . . .	5	Mathematics 3A-3B . . . . .	3
Chemistry 1A-1B . . . . .	5	Chemistry 5 . . . . .	3
Economics 1A . . . . .	3	Geology 1 . . . . .	3
English 1A-1B . . . . .	3	Physics 2A-2B . . . . .	3
Elective . . . . .	3	Physics 3A-3B . . . . .	1
	15	Engineering 1A . . . . .	3
	16	Elective . . . . .	3
			15
			16

## LANDSCAPE ARCHITECTURE

<i>Freshman Year</i>		<i>Sophomore Year</i>	
Military Science . . . . .	2	Military Science . . . . .	2
Botany 12 . . . . .	4	Architecture 1, 2 . . . . .	3
Art 2A-2B . . . . .	2	Architecture 12 . . . . .	1
English 1A-1B or		Architecture 13 . . . . .	1
Speech 1A-1B . . . . .	3	Engineering 21 . . . . .	3
Architecture 5N . . . . .	2	Decorative Art 6A . . . . .	2
Economics 1A-1B . . . . .	3	Landscape Architecture	
Elective . . . . .	4	1A-1B . . . . .	3
	16	Landscape Architecture 2 . . . . .	2
	16	History 17A . . . . .	3
		Political Science 1 . . . . .	3
		Electives . . . . .	3
			17
			17

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

† Students who prepare for forestry at institutions which do not offer a one-semester 5-unit course in general botany should take a year course usually with a total of 8 units of credit. This does not take the place of 4 units of plant physiology with laboratory (Botany 111).

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

PLANT SCIENCE

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

RANGE MANAGEMENT

<i>Freshman Year</i>		<i>Fall</i>	<i>Spring</i>	<i>Sophomore Year</i>		<i>Fall</i>	<i>Spring</i>
		Units	Units			Units	Units
Military Science	.....	2	2	Military Science	.....	2	2
Botany 1	.....	5	..	Botany 111	.....	4	..
Chemistry 1A, 8	.....	5	3	†Economics 1A-1B	.....	3	3
English 1A	.....	3	3	Engineering 1A	.....	3	..
Zoölogy 1A-1B	.....	4	4	English 1B	.....	3	..
Elective	.....	3	3	Geology 1	.....	3	..
		16	15	Physics 2A-2B	.....	3	3
				Elective	.....	3	..
						17	15

SOIL SCIENCE

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

PREVETERINARY SCIENCE

<i>Freshman Year</i>		<i>Fall</i>	<i>Spring</i>	<i>Sophomore Year</i>		<i>Fall</i>	<i>Spring</i>
		Units	Units			Units	Units
Military Science	.....	2	2	Military Science	.....	2	2
English 1A	.....	3	..	Chemistry 8, 5	.....	3	3
English 1B or Speech 1A	..	3	3	Physics 2A-2B	.....	3	3
Chemistry 1A-1B	.....	5	5	Elective	.....	8	9
*Zoölogy 1A-1B	.....	4	4				
†Elective	.....	3	3				
		17	17			16	17

Junior and Senior Years

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

Approval of Study Lists

The study list of each student must be endorsed by the major subject adviser, and approved by the Dean of the College of Agriculture, before it may be filed with the Registrar.

\* Special permission will be granted to students in Preveterinary Science to take Zoölogy 1A, provided Chemistry 1A is taken concurrently.

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

‡ See list of restricted electives on page 86.

### Honors

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

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

### COLLEGE OF ARCHITECTURE

The fall semester of 1953 marked the establishment of the College of Architecture with a curriculum leading to the five-year degree of Bachelor of Architecture which will progressively replace the present curriculum of the School of Architecture leading to the four-year degree of Bachelor of Arts. Students shall therefore enroll in one of the following categories as indicated:

1. Students enrolled in the School of Architecture, or with an architecture major in the College of Letters and Science prior to September, 1953, must register in the College of Architecture and continue in the curriculum existing at the time of first enrollment; either the curriculum leading to the four-year Bachelor of Arts degree if first enrolled prior to September, 1953, or the curriculum leading to the five-year Bachelor of Architecture degree if first enrolled on or after that date.

2. Transfer students entering the University with credit accepted as equivalent to courses Architecture 1 or Architecture 2 of the School of Architecture four-year curriculum taken prior to September, 1953, may pursue the curriculum leading to the four-year Bachelor of Arts degree by registering in the College of Architecture. Transfer students who began their architectural education in September, 1953, or after, shall pursue the five-year curriculum leading to the Bachelor of Architecture degree.

3. Students entering the University as first-semester freshmen shall register in the College of Architecture and pursue the curriculum leading to the five-year Bachelor of Architecture degree.

New students requesting advanced standing in architectural design, descriptive geometry, water color, pen and ink, pencil drawing, and history of architecture courses offered by the College must present a comprehensive, well-organized exhibit of their work for evaluation by the faculty during registration week.

*Advisers: Freshman and sophomore years*—Mr. STUMP, Mr. CARDWELL; transfer students—Mr. DOWNS, Mr. LAGORIO, Mr. SIMONDS; junior and senior years—Mr. JORY, Mr. BORN, Mr. DEMARS, Mr. CZAJA; graduate years—Mr. WURSTER, Mr. JEANS.

#### PRESCRIBED CURRICULUM FOR THE BACHELOR OF ARCHITECTURE DEGREE\*

<i>Freshman Year</i>	<i>Fall</i> Units	<i>Spring</i> Units	<i>Sophomora Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
Subject A (see page 36) . . . . .		..	Military Science . . . . .	2	2
American History and American Institutions see page 37) . . . . .		..	Architecture 3N, 4N . . . . .	3	4
Military Science . . . . .	2	2	Architecture 7, 13 . . . . .	2	1
Mathematics 3A-3B . . . . .	3	3	Architecture 11, 12 . . . . .	1	1
Physics 2A . . . . .	3	3	Physics 2B . . . . .	3	..
Physics 3A . . . . .	1	1	Physics 3B . . . . .	1	..
Architecture 1N, 2N . . . . .	3	3	Engineering 18A-18B . . . . .	3	3
Architecture 5N, 6N . . . . .	2	2	Engineering 21 . . . . .	3	..
Architecture 14A . . . . .	2	..	English 1A or Speech 1A . . . . .	3	3
Art 2A . . . . .	2	..	Elective . . . . .	3	3
Elective . . . . .	3	3			
	17	17		18	17

\* Complete curriculum for the full five years may be obtained at the office of the Dean of the College of Architecture.

The degree of Bachelor of Arts will be recommended for students of the College who have complied with the rules for candidacy for this degree and have successfully completed the prescribed undergraduate curriculum in architecture existing prior to September, 1953 (or other training considered equivalent by the faculty of the College).

In the absence of the Associate in Arts degree, the following will be required for the Bachelor of Arts degree: 16 units of foreign language; three year courses; 11 units of natural science (see requirements (b), (c), and (d) of the College of Letters and Science, pages 61-62).

The degree of Master of Arts will be recommended for students of the College who have been in residence for at least one year after obtaining the Bachelor of Arts degree, who have completed the prescribed curriculum for the first graduate year with an average grade of B or better, who have been duly advanced to candidacy, and who have presented a thesis acceptable to the faculty of the College.

Students expecting to follow architecture as a profession must have received the Master of Arts degree or the Bachelor of Architecture degree in order to be recommended to the licensing boards of the various states. (See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.)

The degree of Graduate in Architecture will be recommended for students in the College who have been in residence for at least two years after obtaining the Bachelor of Arts degree or one year after the Bachelor of Architecture degree, who have completed the prescribed curriculum for the graduate years with the average grade of B or better, including the thesis, and who have been duly advanced to candidacy.

PRESCRIBED CURRICULUM FOR THE BACHELOR OF ARTS DEGREE\*

<i>Junior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Senior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Civil Engineering 112 . . . . .		2	Civil Engineering 107E,		
Architecture 101A-101B. 5	5	5	107F . . . . .	3	3
Architecture 5C, 5D. . . . .	2	2	Civil Engineering 108F . . . . .		1
Architecture 6C, 6D. . . . .	1	1	Architecture 102A-102B. 5	5	5
Architecture 12 . . . . .	1	..	Architecture 108A-108B. 3	3	3
Architecture 13 . . . . .	1	..	Architecture 112 . . . . .		1
Architecture 14A . . . . .	..	2	Architecture 142 . . . . .	2	..
Architecture 115 . . . . .	..	1	Electives . . . . .	3	3
Electives . . . . .	6	3			
	16	16		16	16
		<i>First Graduate Year</i>		<i>Fall Units</i>	<i>Spring Units</i>
		Architecture 200 . . . . .		5	..
		Architecture 201A . . . . .		1	..
		Architecture 201B . . . . .		..	7
		Architecture 207 . . . . .		3	..
		Architecture 208 . . . . .		..	3
		Architecture 209 . . . . .		..	2
		Electives . . . . .		3	..
		Thesis for the degree of Master of Arts . . . . .		..	..
				12	12
		<i>Second Graduate Year</i>			
		Architecture 202 . . . . .		6	..
		Electives (to be arranged) . . . . .		3	5
		Thesis for the degree of Graduate in Architecture . . . . .		..	..
				9	5

For description of courses named above, see the ANNOUNCEMENT OF COURSES, DEPARTMENTS AT BERKELEY.

\* Curriculum for the freshman and sophomore years may be obtained at the office of the Dean of the College of Architecture.

*Honors.*—Honors with the Bachelor of Arts degree in architecture may be recommended by the faculty for students graduating from the College for distinguished work in design and satisfactory work in construction.

*Thesis for the degree of Graduate in Architecture.*—The thesis must be prepared under the supervision of the Dean of the College and the staff. It consists of the serious study of a major building problem, with the emphasis not only upon design but upon construction as well. Preferably, it will be based upon actual conditions of site and use, the final study being carried to a point where no doubt exists of its reality. Preliminary studies providing a sound basis for the thesis should be completed during the first semester of the second graduate year so the second semester may be devoted entirely to the development and presentation of the design itself. The thesis may also consist of a major architectural research problem to be decided upon in cooperation with the Dean and the faculty.

### COLLEGE OF CHEMISTRY

*Preparation.*—Students who propose to enter the College of Chemistry must include in their high school programs physics (1 unit), chemistry (1 unit), mathematics including trigonometry and two years of algebra (3½ units), foreign language (2 units). German is to be preferred as the foreign language with French second choice. It is strongly recommended that solid geometry (½ unit) and mechanical drawing (1 unit) be included. Additional foreign language is also desirable. Students with serious deficiencies in this preparation will ordinarily not be allowed to enroll in the College of Chemistry.

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

*Graduation.*—The degree of Bachelor of Science is granted upon the completion of a curriculum approved by the Study-Lists Committee of the College of Chemistry. The equivalent of four years of residence and 124 units are minimum requirements. However, many students must complete additional units and in some cases an additional semester in order to fulfill the specific requirements stated below. The student must have obtained as many grade points as there are units of credit in all courses which he has taken in the University. The first two years may be completed in a junior college or in any college or university of approved standing. Any student who hopes to complete the requirements for graduation in the minimum time of eight semesters should plan to transfer to this University not later than the end of his fourth semester.

*Minimum Scholarship Requirements.* (See page 43.)

*Study-list limits.* Ordinarily, students will not be permitted to enroll for fewer than 12 or more than 18 units a semester.

*Language requirements.*—A reading knowledge of scientific German is essential before the work of the junior year is undertaken. German 2 or 3S is deemed to fulfill the German requirement. The student is also urged to acquire a reading knowledge of French. Reasonable proficiency in the use of English is a requirement for graduation in the College of Chemistry. This requirement may be satisfied by a grade of C or better in English 1A or Speech 1A, or by special examination.

*Honor students in the upper division.*—Students who in the first two years of their college work have attained an average of at least two grade points for each unit undertaken will receive honorable mention with junior standing. These students are entitled to register as candidates for honors. After the first semester of the junior year, the Committee on Honors of the College of Chem-

istry will determine which students shall remain in the honors group and which students shall be promoted thereto. Honor students will be given a larger share of personal instruction and a greater opportunity to choose courses and work within courses, in the manner best suited to individual needs and aims. Students not in the honors group will not, except in unusual circumstances and with the express permission of the instructor, be permitted to enroll for honors courses (marked H) or for undergraduate research. Students will not ordinarily be recommended for honors at graduation unless their work includes advanced courses approved by the Committee. Normally these courses are Chemistry 114H and 180H for students in basic chemistry and either Chemical Engineering 149H or Chemical Engineering 180H for students in chemical engineering. Subject to the approval of the study-list adviser and of the instructor in the course concerned, students in honors status have the privilege of taking each semester one course not offered by them in satisfaction of subject requirements for the curricula of the College of Chemistry in which they shall be marked "passed" or "not passed." In calculating the grade-point standing, units gained in this way are not counted. Students in the honors group in basic chemistry should confer with Professor Orlemann, Chairman of the Committee on Honors of the College of Chemistry, 105 Lewis Hall, with respect to their plans for the last two years of college work. Those in the curriculum in chemical engineering should confer with Professor Bromley, 211 Gilman Hall. The list of students upon whom honors and highest honors are conferred appears in the annual COMMENCEMENT PROGRAMME.

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

- (a) Mathematics 3A, 3B, 4A, 4B or 14A, 14B.
- (b) Physics 4A, 4B, 4C.
- (c) Chemistry 1A, 1B, 5, 12, 112\*, 110A, 110B, 111, and at least 6 additional units of advanced quantitative analysis or advanced inorganic chemistry.
- (d) A reading knowledge of German and satisfactory proficiency in the use of English.
- (e) The general University requirements in military science, American History and American Institutions.

*Lower division.*—The following program is recommended for students with normal preparation:

<i>Freshman Year</i>	<i>Fall</i> Units	<i>Spring</i> Units	<i>Sophomors Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
Chemistry 1A-1B . . . . .	5	5	Mathematics 4A-4B . . . . .	3	3
Mathematics 3A-3B . . . . .	3	3	Physics 4B-4C . . . . .	4	4
German 1-2 . . . . .	4	4	Chemistry 5, 12 . . . . .	3	5
<sup>1</sup> Engineering 22 (or			Chemistry 110A (or		
English 1A) . . . . .	2 or 3	..	Engineering 35) . . . . .	..	3
Physics 4A . . . . .	..	4	English 1A (or		
Military Science . . . . .	2	2	Engineering 22) . . . . .	2 or 3	..
<sup>4</sup> Subject A . . . . .	..	..	Military Science . . . . .	2	2
	16 or 17	18		14 or 15	17

*Upper division.*—The student must have completed that portion of the specific requirements (a) to (e) listed above, which are included in the normal curriculum for the first two years, or their equivalent, in order to obtain upper division standing.

Unless a student has a grade-point average of a least 1.5 in these specific lower division courses, he is seldom successful in the upper division. Admission

\* Students in the Chemical Engineering curriculum may elect 112C instead of 112.

<sup>1</sup> Students with high school German may take German 3S, 4S or may substitute non-technical electives.

<sup>2</sup> Engineering 22 and 35 are required for chemical engineering students.

<sup>3</sup> Speech 1A may be substituted for English 1A.

<sup>4</sup> For regulations concerning Subject A, see page 36.

to the upper division with a lower average will be allowed only with the special approval of the Dean, who may require a comprehensive examination.

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

### Major in Basic Chemistry

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

It is permissible to complete a biochemistry major (as outlined in the ANNOUNCEMENT OF COURSES) in the College of Chemistry within the major in basic chemistry. For such students, Biochemistry 100A-100B will be considered as a course in chemistry.

### Curriculum in Chemical Engineering

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

Junior Year			Senior Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Chemistry 112 . . . . .	5	..	Chem. Eng. 146B-149† ..	4	2-3
Engineering 35* (or Chemistry 110A) . . . . .	3	..	Chemistry 104 (or 105) or Elect. Eng. 101 . . . . .	3	..
Chemistry 110B, 111 . . . . .	6	6	Mech. Eng. 107 . . . . .	3	..
Chem. Eng. 143, 146A . . . . .	3	3	Metallurgy 152 or Engineering 42 . . . . .	2-4	..
Civil Eng. 108A . . . . .	4	4	Chem. Eng. 144, 145A . . . . .	3	3
Mathematics 110A, 110B. . . . .	2	2	Business elective . . . . .	3	3
Elect. Eng. 101 or Chemistry 104 (or 105) . . . . .	3	..	Chem. Eng. 147 or 152† . . . . .	3	3
Nontechnical elective . . . . .	..	2-3	Chem. Eng. 180H or Engineering elective† . . . . .	3	3
	16	17-18		15-17	14-15

\* Engineering 22 is required unless taken in the lower division.

† Alternative technical electives may be chosen from the list of suggested subjects.

Senior electives in this curriculum will normally be chosen from the following list:

Bacteriology 2; Biochemistry 102; Ceramic Engineering 100, 161; Chemical Engineering 145B, 244; Chemistry 114H, 118, 119, 120, 122, 123; Civil Engineering 109B, 124, 147; Electrical Engineering 102, 105, 106; Engineering 23; Engineering Design 102B, 106; Food Technology 112, 113; Mechanical Engineering 152, 161, 163, 164, 180; Metallurgy 100A, 108, 111; Petroleum Engineering 131A-131B; Physics 121; Public Health 170.

Since the four-year chemical engineering curriculum offers little opportunity for the student to explore additional areas of knowledge of his own choosing, a five-year curriculum in chemical engineering is recommended to students who can afford the extra time. The extra year makes it possible for the student to include electives in the humanities or social sciences in addition to some more advanced work in chemistry and chemical engineering.

In the fifth year there are two programs outlined. The honor student who can meet Graduate Division requirements may take the B.S. degree in basic chemistry at the end of the fourth year and then the M.S. degree in chemical engineering at the end of the fifth year. The non-honor student will not ordinarily be allowed to undertake the graduate courses or research, but may receive his degree in both chemical engineering and basic chemistry by postponing his B.S. degree until after all undergraduate requirements in chemical engineering have been completed. Recommended course schedules for the five-year curriculum are given in the ANNOUNCEMENT OF THE COLLEGE OF CHEMISTRY.

### COLLEGE OF DENTISTRY

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

Classes are admitted to the College of Dentistry once a year, in September. Applications for admission in September, 1955, may not be filed prior to October 1, 1954. The deadline date is December 31, 1954. All transcripts of record must be filed by the deadline date. For further information write to the office of the Dean of the College of Dentistry. Freshman students who plan to apply for admission in 1956 may file preapplication declaration forms as soon as they have completed their first semester of college work, provided they have a B average or better, but not later than March 1, 1955.

Upon the satisfactory completion of six semesters the dental student will be eligible for the Bachelor of Science degree, and for the Doctor of Dental Surgery degree upon the completion of two additional semesters. The Bachelor of Science degree will be granted the student in the dental hygiene curriculum at the end of the fourth semester.

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



### Admission to Dental Curricula

All applicants for admission to the dental curricula must have completed at least 60 units of college work with a scholarship average satisfactory to the Admissions Committee, including the requirements (2)-(5) listed below. Students who have attended the University of California must have a C average or better in work undertaken in the University. In addition, all applicants must take a performance test, designed to test manual dexterity. This test must be taken on the San Francisco campus, and is given during the Christmas recess and during the period between the fall and spring semesters. A third test may be given during the spring recess, depending upon the deadline date set for filing applications for admission. The dental aptitude test of the American Dental Association is also a requirement for admission. For further information regarding this test, write the Admissions Office, Room 62A, Hospital Building, University of California, Medical Center, San Francisco 22. The College of Dentistry reserves the right to limit enrollment on the basis of scholarship, results of the performance and aptitude tests, recommendations, and interviews. At the present time, because of limited facilities and the large number of applications, it is not possible for the College of Dentistry to act favorably upon applications from persons who have not had the major portion of their high school and preprofessional education and residence in California or in one of the far western states which does not have a dental school. Exception to this is made only in the cases of persons who have been residents of the State of California for over one year. The student will find himself more adequately prepared for the dental curricula if he has taken in high school the following subjects: English, 3 units; history, 1 unit; mathematics, 3 units (algebra, plane geometry, and trigonometry); chemistry, 1 unit; physics, 1 unit; foreign language, 2-4 units.

### Requirements for First and Second Years

- |   |          |
|---|----------|
| (1) General University requirements*  |          |
| Subject A (see page 36).  |          |
| Military science .....  | 8 units  |
| (2) English or Speech (1A-1B†) .....  | 6        |
| (3) Science .....   | 28-32    |
| (a) Chemistry   |          |
| Inorganic (1A-1B) .....   | 10 units |
| Organic lecture (8) .....   | 3        |
| Organic laboratory (9) or quantitative analysis (5) .....   | 3        |
| (b) Physics with laboratory (2A-2B and 3A-3B or 4A-4B) .....  | 6-8      |
| (c) Biology, including one full semester of vertebrate zoölogy, with laboratory (Zoölogy 1A-1B) ... | 6-8      |
| (4) Trigonometry (Mathematics C) .....  | 3 units  |
| It is suggested that this requirement be completed in high school.                                  |          |
| (5) Electives selected as indicated from the following groups: ....                                 | 15-20    |
| (a) Group I: 2 year courses selected from Anthropology (2A-2B), Economics (1A-1B), Economic         |          |

\* The requirement of American History and American Institutions is also prerequisite to the bachelor's degree, page 37. Although this requirement may be satisfied while enrolled in the College of Dentistry, it is preferable that it be completed in the pre dental program.

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

Geography, Geography, History (4A-4B, 8A-8B, 17A-17B), Mathematics (1, 2, 3A-3B, 10, 11A-11B, 12), Political Science (1, 2), Psychology (1A-33), Public Health (5A-5B), Sociology and Social Institutions (1, 2), History 17A or 17B in combination with Political Science 1 will be accepted as a year course in this group. . . . . 12-14 units

- (b) Group II: Either (a) one year course or year sequence in foreign literature in translation (French 39A-39B, German 39A-39B-39C), a year sequence of any foreign language, English (44A-44B, 46A-46B), Music (21A-21B), Philosophy (6A-6B, 20A-20B); or (b) any combination of two semester courses selected from Architecture (5A, 5B, 5C, 14A-14B), Art (1A, 1B, 1C, 1D, 10), English (30), Music (27A-27B), or any two semesters of a foreign language in which at least 6 units have previously been completed or are completed concurrently.

### **Admission to the Dental Hygiene Curriculum (Open to Women Only)**

Applicants for admission to the dental hygiene curriculum must have completed at least 60 units of college work with a scholarship average satisfactory to the Admissions Committee, including the requirements (2) to (5) listed below. Students who have attended the University of California must have a C average or better in work undertaken in the University. The College of Dentistry reserves the right to limit enrollment if applications exceed the available facilities and to require interviews and aptitude tests if they are necessary in the selection of a class. The student will find herself more adequately prepared if she has taken in high school the following subjects: English, 3 units; history, 1 unit; mathematics, 2 units (algebra and plane geometry); chemistry, 1 unit; physics, 1 unit; foreign language, 3 or, preferably, 4 units.

(1) General University requirements:

Subject A (examination in English composition, see page 36).

American History and American Institutions (required for the bachelor's degree). The examination in American History and American Institutions may be taken in the College of Dentistry, but it is preferable to satisfy the requirement in the pre-dental hygiene program. (see page 37.)

- (2) English or speech (1A-1B\*) . . . . . 6 units  
 (3) Chemistry (1A, 8) . . . . . 8  
 (4) Biology (Zoölogy 1A-1B) . . . . . 6-8  
 (5) *Either* the Associate in Arts degree from the University of California or the University's degree requirements completed at another accredited university or college, or the following program of courses:  
 (a) A year course selected from each of the three groups: I, II, and III. . . . . 18-20 units  
 Group I: Anthropology (2A-2B), Economics

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

(1A-1B), History (4A-4B, 8A-8B, 17A-17B), Political Science (1, 2), Sociology and Social Institutions (1, 2); History 17A or 17B in combination with Political Science 1 will be accepted as a year course in this group.

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

Group III: Philosophy, Art, Music, Literature, Foreign Language.

- (b) Six additional units selected from any one of the three groups listed under (a)..... 6  
 (c) Electives .....12-16

### COLLEGE OF ENGINEERING

*Matriculation requirements.*—A statement concerning matriculation requirements will be found on page 23. High school subjects prerequisite to college courses required in all engineering curricula include: plane geometry, 1 unit; algebra, 2 units; trigonometry,  $\frac{1}{2}$  unit; mechanical drawing\*, 1 unit; chemistry, 1 unit, or physics, 1 unit (both are desirable). Without this preparation it will be necessary for the student to take equivalent courses in college, thereby barring him from the regular courses and delaying his graduation. Degree credit in the College of Engineering is not allowed for any course (such as trigonometry) which is equivalent to a matriculation subject listed as prerequisite for a required course in the engineering curricula.

Laboratory courses in the various curricula of the College 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 frequently results when such skills are absent and this can frequently be traced to the fact that the student has had no prior manual training. It is, therefore, recommended that students wishing to enter the College of Engineering elect shop courses in high school, especially machine shop, for at least one semester.

*Advanced standing.*—For general information, see page 28.

*Admission to the College of Engineering.*—Satisfaction of the matriculation requirements admits the student to the University but not necessarily to the College of Engineering. Admission to the College of Engineering will be based on the results of an entrance examination and a consideration of the student's grades. All applicants for admission to the lower division must take the *Engineering Examination, Lower Division*. This examination is an aptitude test designed to demonstrate the applicant's general scholastic ability, and his ability to comprehend scientific materials and principles, to use mathematical concepts and to judge spatial relationships. The examination content presupposes substantial completion of the matriculation requirements for engineering students. Admission to the lower division will be based upon results achieved in the test and the grade-point average achieved in University matriculation requirements.

Admission to all upper division courses and continuation in the College of Engineering is based on satisfactory completion of the *Engineering Examination, Upper Division* (which is given to every engineering student just prior to the completion of or at the end of the sophomore year) and a consideration

\* Students deficient in the mechanical drawing requirement, but otherwise qualified, will be permitted to remove the deficiency by enrolling in course Engineering 23D during their first semester. No university credit is allowed, however.

of the student's grades in the freshman and sophomore required subjects. This examination is an achievement test including the subject areas of English usage, engineering drawing and descriptive geometry, general chemistry, mathematics through integral calculus, and general physics.

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

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

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

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

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

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

(2) Subjects characteristic of the several curricula. In addition to the subjects and units common to all curricula in engineering, the several curricula include at least the number of units in each of the subjects shown in the following table. Each curriculum requires the total number of units shown at the top of the column, the totals in all cases including the 8 units of military science required of all male undergraduates. Students not required to study military science may substitute other subjects aggregating the same number

of units. Credit in physical education may be used for this purpose up to a maximum of four units. The optional subjects noted are to be chosen from sequences of scientific and professional courses giving emphasis to a particular phase of a general field.

	Units		Units
<i>Agricultural Engineering:</i> .....	134	<i>Mechanical Engineering:</i> .....	131
Mechanics, Thermodynamics, Fluid Mechanics .....	6	Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials .....	11
Irrigation, Soil Science, Agronomy .....	13	Mechanical Design and Manufac- turing Processes .....	10
Agricultural Machinery and Struc- tures .....	17	Electrical Circuits and Machines .....	5
Optional Subjects .....	18	Optional Subjects .....	25
<i>Civil Engineering:</i> .....	132	<i>Metallurgy:</i> .....	131
Mechanics, Strength of Materials, Properties of Materials, Specifi- cations .....	9	Chemistry .....	8
Hydraulic, Water Supply, Sewer- age, Foundation, Structural, and Transportation Engineering .....	14	Metallurgy .....	20-24
Optional Subjects .....	24-29	Optional Subjects .....	19-23
<i>Electrical Engineering:</i> .....	128	<i>Mining:</i> .....	130
Mathematics .....	4	Chemistry .....	2
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials .....	4	Dynamics .....	3
*Electrical Circuits and Machines .....	21	Geology and Mineralogy .....	13
Optional Subjects .....	19	Mining and Mineral Exploration .....	10
<i>Engineering Physics:</i> .....	128	Metallurgy .....	7
Chemistry .....	8	Surveying and Map Drawing .....	6
Physics .....	8	Optional Subjects .....	9
Mathematics .....	4	<i>Petroleum Engineering:</i> .....	130
Optional Subjects .....	20	Chemistry .....	8
Foreign Language .....	8	Geology .....	9
<i>Industrial Engineering:</i> .....	134	Mathematics .....	4
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials .....	10	Mechanics, Strength of Materials, Electrical Circuits and Machines .....	5
Electrical Circuits and Machines .....	5	Professional Aspects of Engineering .....	3
Business Administration .....	15	Petroleum Engineering .....	14
Optional Subjects .....	24	Optional Subjects .....	7
		<i>Process Engineering:</i> .....	131
		Chemistry .....	13
		Unit Operations .....	18
		Engineering Design of Processes and Equipment .....	6
		Optional Subjects .....	14

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

- (1) Satisfy the general University requirements:
  - (a) Military science. See page 39. Eight units of credit toward the degree will be allowed those students who are required to take military science. Those who are exempt from this requirement must make up the 8 units by taking elective courses.
  - (b) Subject A. See page 36.
  - (c) American History and American Institutions. See page 37.
  - (d) Residence during the senior year. See page 41.  
Students in the College of Engineering are required to take the final 32 units of work in residence in the College of Engineering rather than the minimum required by the University.
  - (e) Grade points. See page 42.

To be eligible for the bachelor of science degree, a student must have achieved at least a C average in all courses of upper division level offered in

\* Including 3 units of Engineering Design.

*satisfaction of subject requirements and restricted electives of the student's curriculum and option.*

(2) Satisfactorily complete one of the engineering curricula. A student who gives full time to University responsibilities may enroll without special permission for the number of units required in his program of study (see pages 102-110). A student who engages in part-time employment should plan to spend more than four years by enrolling each semester for fewer than the required number of units. In such cases, course sequences must be carefully planned if delay is to be avoided.

*Counselors will aid candidates for military or naval commissions in re-arranging their programs of study to include upper division courses in Military or Naval Science.*

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

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

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

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

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

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

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

Students in agricultural, civil, industrial, mechanical, mining, petroleum, and process engineering, and metallurgy must select at least 3 units from group 1.

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

*Pass or Fail Grades:* Subject to the approval of the Committee on Study Lists, students may choose elective courses from any department of the University. Students who have an average grade of B or better for all work undertaken in the University shall have (subject to the approval of the instructor concerned) the privileges of taking each semester one elective course in which they shall be marked "passed" or "not passed." In calculating grade-point standing, units gained in this way shall not be counted.

## PROGRAM OF STUDY IN AGRICULTURAL ENGINEERING

*Specific Course Requirements for the B.S. Degree:*

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 8.
4. Engineering 1A, 22, 23, 24, 35, 40\*, 41\*, 48 (recommended).
5. Civil Engineering 108A, 108F.
6. Electrical Engineering 100A, 100B, 104A, 104B.
7. Mechanical Engineering 105A, 105B, 103, 151 (or Physics 112).
8. Engineering Design 102B, 106 (or Civil Engineering 107A).
9. Agricultural Engineering 12†, 49, 112 (or Chemistry 109), 113, 114, 115, 130.
10. Agricultural Economics 140.
11. Irrigation 120.
12. Soil Science 106.
13. Agronomy 1.

*First Year* (Davis or Berkeley campus).—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 8, Engineering 1A, 22, 23, 48 (recommended), electives, 3 units.

*Second Year* (Davis or Berkeley campus).—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 24, 35, 40\*, 41\*, Agricultural Engineering 12†, electives, 3 units.

*Third Year* (Berkeley campus).—Mechanical Engineering 105A, 105B, Engineering Design 102B, 106 (or Civil Engineering 107A), Civil Engineering 108A, 108F, Electrical Engineering 100A, 100B, 104A, 104B, Mechanical Engineering 103, Agricultural Economics 140, electives, 3 or 4 units.

*Fourth Year* (Davis campus).—Agricultural Engineering 112 (or Chemistry 109), 113, 114, 115, 130, Mechanical Engineering 151 (or Physics 112), Irrigation 120, Soil Science 106, Agronomy 1, electives, 3 units, technical electives, 3 units.‡

*Summer Course:* Agricultural Engineering 49, summer course given at Davis, 6 units. May be taken after the sophomore year.

*Electives:* For selection of electives, see page 101.

## PROGRAM OF STUDY IN CIVIL ENGINEERING

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

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B.
4. Engineering 1A, 1B, 8, 22, 23, 35.
5. Geology 1.
6. Engineering Design 102B.
7. Civil Engineering 106, 107A, 108A, 108C, 108E, 109A, 111A, 113, 116, 133, 135, 161.
8. Mechanical Engineering 103, 105A.
9. Electrical Engineering 101.

† Entering juniors may substitute approved technical units for this course.

\* Students at Davis must postpone these courses until the junior year on the Berkeley campus.

‡ Recommended technical electives: Agricultural Engineering 198, 199, 106, Pomology 12, Vegetable Crops 1, Veterinary Science 111, 3, Animal Husbandry 101, 110, Bacteriology 2, Botany 1, 107, Chemistry 101, 109, English 106L, Irrigation 125, 180, 160, Mathematics 110A–110B, 119A–119B, 130A–130B, Zoology 10, Dairy Industry 1, Soil Science 110.

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

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

*Third Year.*—Engineering Design 102B, Civil Engineering 107A, 108A, 108C, 108E, 135, 161, Mechanical Engineering 103. (Students in sanitary and municipal options take Civil Engineering 161 in senior year and Civil Engineering 111A in junior year.)

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

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

*Construction:*

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

Fourth Year: Engineering 120, Civil Engineering 181, Business Administration 122, Mechanical Engineering 105A, electives, 8 units.

*Hydraulics:*

Third Year: Mechanical Engineering 105A, Civil Engineering 133, 3 units of electives, 6 units of restricted electives.

Fourth Year: Civil Engineering 151, 9 units of electives, 9 units of restricted electives.

Restricted electives are to be chosen from the following: Irrigation 102A, 102B, 104, 112; Civil Engineering 166; Engineering 120, 197; Mechanical Engineering 161, 162; Mathematics 110A–110B.

*Irrigation:*

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

Fourth Year: Irrigation 101, 102B, 104, 112, Civil Engineering 151, electives, 10 units.

*Sanitary and Municipal:*

Third Year: Civil Engineering 123, Public Health 111, 117, electives, 5 units.

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

Students interested in public health should elect at least 5 units from the following: Public Health 112, 113, 118, 145, 147A, 153B, 162, 170, 171; Chemistry 8, 109; Civil Engineering 126, 147, 198, 199; Physiology 107; Political Science 181; Physics 125, 126; Soil Science 111; Engineering 120; Biochemistry 102. Students interested in municipal engineering should elect at least 5 units from the following: Political Science 162, 181; Civil Engineering 102A, 147, 171, 198 or 199; City and Regional Planning 121; Engineering 120; Architecture 117; Landscape Architecture 116; Soil Science 111; Biochemistry 102; Irrigation 112.

*Structural:*

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

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

*Transportation:*

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

Fourth Year: Civil Engineering 108H, 108G, 104, 136, 171, Mechanical Engineering 105A, electives, 6 units.

*Electives:* For selection of electives, see page 101.

\* Entering seniors may substitute approved technical units for this course.



## PROGRAM OF STUDY IN ELECTRICAL ENGINEERING

*Specific Course Requirements for the B.S. Degree:*

1. Mathematics 3, 4A, 4B, 110.
2. Chemistry 1A, 8, or 1B.
3. Physics 4A, 4B, 4C.
4. Engineering 22, 23, 35, 42, 113, 120.
5. Electrical Engineering 109A, 109B or the following courses: 104A, 104B, and 105, and 106, and 110A, 110B, 111A, 116A, 132A, 133A.
6. Mechanical Engineering 105A, 107, 109.
7. Engineering Design 102B.
8. Civil Engineering 108A, 108F.

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

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

*Third Year.*—Electrical Engineering 109A, or 109B or the following courses: 110A, 110B, 104A, 104B, 105, 106; Mechanical Engineering 105A, 109, Engineering Design 102B, Civil Engineering 108A, 108F, electives, 4 units.

*Fourth Year.*—Electrical Engineering 111A, 116A, 132A, 133A. Engineering 113, 120, Mechanical Engineering 107 and 15 units of restricted electives. Senior students will select a sequence of restricted electives in any one of the options indicated or any other logical sequence of courses approved by the junior and senior counselors. These restricted elective units must be of senior level and are to be taken at the University of California. Suggested options are:

*Business Administration:* Business Administration 101, 105 or 109, 131, 140, 150, 160 (students should also elect Business Administration 1A, 1B, and 18 as part of their lower division programs, if possible).

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

\**Control Systems:* Electrical Engineering 127, 128, Mechanical Engineering 164, Engineering Design 180, Mathematics 119A, 185.

*Digital Computers:* Electrical Engineering 151A, 151B, 152A, 152B, 153A, 153B; Mathematics 128A, 128B, Engineering Design 180 recommended.

*Illumination:* Electrical Engineering 140, 140L, 141, 141L, 142, Optometry 109, Physics 108A, 108B.

*Industrial Electronics:* Electrical Engineering 126, 103A, 103B, 140 or 141, 151A, 151B.

*Physics:* Electrical Engineering 117A, 117B, Physics 115, 121, and a choice of Physics 124, 129A, 129B, 108B, 130, Electrical Engineering 103A, 103B, 140, 141.

*Power Machinery:* Electrical Engineering 111B, 127, 128, 133B, Engineering Design 170.

*Power Systems:* Electrical Engineering 111B, 118A, 118B, 122A, 122B, 133B.

*Electives:* In addition to completing the requirements noted above, 12 units of electives must be included in the program. See page 101 for selection of electives.

\* Copies of the booklet *Automatic Control* may be obtained from the Office of the Dean, College of Engineering.

## PROGRAM OF STUDY IN ENGINEERING PHYSICS

*Specific Course Requirements for the B.S. Degree:*

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

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

*Second Year.*—Mathematics 14A, 14B, Chemistry 8, 109 (or 5), Physics 4B, 4C, foreign language, 8 units.

*Third Year.*—Physics 105A, 105B, 121, 110A, 110B, 112. Mechanical Engineering 103, restricted electives (may be junior courses), 9 units.

*Fourth Year.*—Physics 108B, Mechanical Engineering 164, Engineering 120, Civil Engineering 108A, restricted electives, 11 units (must be senior-level courses), electives (non-engineering), 6 units\*, electives (free), 3 units. Restricted electives are to be chosen with the approval of the study-list counselor from subjects in the fields of engineering, science, and mathematics. At least 10 of these units shall be in engineering subjects. Restricted electives should be selected from courses in a consistent field of study.

*Electives:* For selection of electives, see page 101.

## PROGRAM OF STUDY IN INDUSTRIAL ENGINEERING

(Students ordinarily are not allowed to transfer to the industrial engineering program after the beginning of the junior year.)

*Specific Course Requirements for the B.S. Degree:*

1. Mathematics 3A, 3B, 4A, 4B, 130E.
2. Chemistry 1A, 8.
3. Physics 4A, 4B, 4C.
4. Engineering 1A, 22, 23, 24, 35, 40, 41, 48†, 113, 120.
5. Business Administration 1A, 1B, 100, 140.
6. Civil Engineering 108A, 108F.
7. Electrical Engineering 100A, 100B, 104A, 104B.
8. Engineering Design 102B, 106.
9. Mechanical Engineering 103, 105A, 105B, 107, 143, 145, 146, 147.

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

\* Any engineering or non-engineering elective.

† Not required for transfer students with advanced standing if the credit includes at least 20 units or more of the courses prescribed in the freshman year. Technical units must be substituted for this course.

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

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

*Fourth Year.*—Mechanical Engineering 107, 143, 145, 146, 147, Engineering 113, 120, Business Administration 100, 140, Mathematics 130E, electives, 6 units.

*Electives:* For selection of electives, see page 101.

#### PROGRAM OF STUDY IN MECHANICAL ENGINEERING

##### *Specific Course Requirements for the B.S. Degree:*

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

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

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

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

*Fourth Year.*—Engineering 113, 120. Mechanical Engineering 124A, 124B, 131A, 131B, and 12 units of restricted electives. Senior students will select a logical sequence of restricted electives\* approved by the counselor. Of the 12 units of restricted electives to be taken at the University of California, 5 units must be senior mechanical engineering or engineering design courses taken at Berkeley. The following list of options will aid the student in selecting restricted electives appropriate to his chosen field of study.

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

*Air Conditioning and Refrigeration Option:* Mechanical Engineering 115, 116 or 117, 161, 151, 152, 154, Metallurgy 170A, Chemistry 110A, 110B, or 109.

‡*Automatic Control Option:* Mechanical Engineering 151, 161, 164, Electrical Engineering 121, 127, 128, Engineering Design 170, 180, Mathematics 110A, 110B, 185.

\* Restricted electives are upper division courses, normally offered by the departments of Engineering, Chemistry and Chemical Engineering, Mathematics, Physics, and Business Administration.

† Not required for transfer students with advanced standing if the credit includes at least 20 units or more of the courses prescribed in the freshman year. Technical units must be substituted for this course.

‡ Copies of the booklet *Automatic Control* may be obtained from the office of the Dean, College of Engineering.

*Automotive Option:* Mechanical Engineering, 123A, 123B, 123C, Metallurgy 170A, Mechanical Engineering 151, 161, Engineering Design 170, 172, 173, Chemistry 109.

*Fluid Mechanics Option:* Mechanical Engineering 161, Mathematics 110A, 110B, Mechanical Engineering 162, 151, Engineering Design 170, Mechanical Engineering 164, Irrigation 102A, 102B, Civil Engineering 166.

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

*Heat Transfer and Thermodynamics Option:* Mechanical Engineering 151, 161, 152, 154, Mathematics 110A, 110B, Physics 112, Chemistry 109, Electrical Engineering 140, 140L, 141, 141L.

*Hydraulics Option:* Mechanical Engineering 161, 162, 164, Civil Engineering 151, 166, Irrigation 102A, 102B, 104, 112, Engineering 197, Mathematics 110A, 110B.

*Naval Architecture and Marine Engineering Option:* Mechanical Engineering 128B, 129A, 129B, 126, 123A, 123B, 123C, 161, 117, Engineering Design 170.

*Mechanical Design Option:* Engineering Design 102C, 170, 171, 172, 111, 173, Mechanical Engineering 145, Mathematics 110A, 110B, Mechanical Engineering 164, Electrical Engineering 126, Metallurgy 170A.

*Process Engineering Option:* Mechanical Engineering 152, 154, 161, 163, 151, 164, 180, Chemistry 109, Chemical Engineering 144.

*Preparation for Graduate Study Option:* Mathematics 110A, 110B or 119A, 119B, Mechanical Engineering 151, 161, 162, Engineering Design 102C, 170, 172, Mechanical Engineering 154, Physics 104, Electrical Engineering 140, 140L, 141, 141L.

*Electives:* For selection of electives, see page 101.

#### PROGRAM OF STUDY IN METALLURGY

##### *Specific Course Requirements for the B.S. Degree:*

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 110A, 110B.
4. Engineering 22, 23, 35 (or Physics 105A), 120.
5. Metallurgy 2A, 100A, 100B, 150A, 150B.
6. Mineralogy 6.
7. Civil Engineering 108A.
8. Mechanical Engineering 103 (or Chemical Engineering 146A).
9. Electrical Engineering 101, 102.

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

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

*Third Year.*—Chemistry 110B, Civil Engineering 108A, Metallurgy 100A, 100B, 150A, 150B, Mechanical Engineering 103 (or Chemical Engineering 146A).

*Fourth Year.*—Electrical Engineering 101, 102, Engineering 120.

Students are required to elect an option in either Extractive Metallurgy or Physical Metallurgy. Courses indicated below are required for completion of the option:

##### *Extractive Metallurgy:*

Second Year: Metallurgy 2B.

Third Year: Metallurgy 108, 110A, electives, 6 units, restricted electives, 2 units.

Fourth Year: Metallurgy 110B, 118, 120, Mining 101, 105A, electives, 3 units, restricted electives, 10 units.

*Physical Metallurgy:*

Second Year: electives, 2 units.

Third Year: Civil Engineering 108F, Engineering Design 102B, Engineering 41, electives, 5 units.

Fourth Year: Engineering Design 106 (or Physics 121), Metallurgy 170, 171, 172, electives, 2 units, restricted electives, 12 units.

*Electives:* For selection of electives, see page 101.

*Restricted Electives:* Restricted electives are to be selected with the approval of the faculty counselor in such a manner as to form a consistent program contributing to the student's professional development.

PROGRAM OF STUDY IN MINING

*Specific Course Requirements for the B.S. Degree:*

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 110A (or Mining 105A).
4. Engineering 1A, 22, 23, 35.
5. Geology 1 or 5, 103, 106A.
6. Mineralogy 6.
7. Mining 1, 101, 103, 105A (or Chemistry 110A), 107A, 107B, 109, 111A.
8. Civil Engineering 108A.
9. Electrical Engineering 101.
10. Mechanical Engineering 103.
11. Metallurgy 2A, 2B, 108, 110A.
12. Engineering Design 102B.

*First Year.*—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 22, 23, Geology 1 or 5.

*Second Year.*—Mathematics 4A, 4B, Mineralogy 6, Engineering 1A, 35, Mining 1, Physics 4B, 4C.

*Third Year.*—Electrical Engineering 101, Geology 103, 106A, Mechanical Engineering 103, Mining 101, 103, Metallurgy 2A, 2B, Engineering Design 102B, electives, 9 units.

*Fourth Year.*—Civil Engineering 108A, Metallurgy 108, 110A, Mining 107A, 107B, 109, 111A, Mining 105A (for Mining option) or Chemistry 110A (for Mineral Exploration option), electives, 12 units.

*Electives:* 12 hours of free electives, 9 hours of electives from the following optional groups: Mining: Mining 105B, 113; Metallurgy 100A-100B; Geology 102A-102B, 116; Engineering 113; Business Administration 160, 145; Mathematics 110A-110B; Ceramics 100. Mineral Exploration: Mining 111B; Mathematics 110A-110B; Physics 105A-105B, 110A-110B, 121; Geology 102A-102B, 111A-111B, 116, 118, 122A-122B; Chemistry 110B.

PROGRAM OF STUDY IN PETROLEUM ENGINEERING

*Specific Course Requirements for the B.S. Degree:*

1. Mathematics 3A, 3B, 14A, 14B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 110A, 110B.
4. Engineering 22, 23, 35, 40, 48, 113, 120.
5. Engineering Design 102B.
6. Mechanical Engineering 103, 105A.
7. Civil Engineering 108A, 108F.
8. Electrical Engineering 101, 102.
9. Petroleum Engineering 100, 110A, 110B, 120A, 120B.
10. Geology 5, 111A, 111B.

*First Year.*—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 22, 23, 48, elective, 3 units.

*Second Year.*—Mathematics 14A, 14B, Physics 4B, 4C, Engineering 35, 40, Geology 5, elective, 3 units.

*Third Year.*—Engineering Design 102B, Mechanical Engineering 103, 105A, Civil Engineering 108A, 108F, Electrical Engineering 101, 102, Petroleum Engineering 100, Chemistry 110A, 110B, Geology 111A, 111B.

*Fourth Year.*—Engineering 113, 120, Petroleum Engineering 110A, 110B, 120A, 120B, \*restricted electives, 7 units, electives, 6 units.

*Electives:* For selection of electives, see page 101.

#### PROGRAM OF STUDY IN PROCESS ENGINEERING

##### *Specific Course Requirements for the B.S. Degree:*

1. Mathematics 3A, 3B, 4A, 4B, 110B.
2. Chemistry 1A, 1B, 12, 110A, 110B.
3. Engineering 22, 23, 35, 40, 48†, 120.
4. Physics 4A, 4B, 4C.
5. Civil Engineering 108A.
6. Mechanical Engineering 103, 105A, 132, 151, 152, 154, 180.
7. Electrical Engineering 101, 102.
8. Engineering Design 102B.
9. Chemical Engineering 143, 145A, 146B.

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

*Second Year.*—Mathematics 4A, 4B, Physics 4B, 4C, Chemistry 12, Engineering 35, 40, electives, 3 units.

*Third Year.*—Civil Engineering 108A, Chemistry 110A, 110B, Chemical Engineering 143, Mechanical Engineering 103, 105A, Electrical Engineering 101, 102, Engineering Design 102B, Mathematics 110B, electives, 6 units.

*Fourth Year.*—Mechanical Engineering 132, 151, 152, 154, 180, Engineering 120, Chemical Engineering 145A, 146B, restricted electives approved by the counselor, 8 units, three units of which must be design.

*Electives:* For selection of electives, see page 101.

### The Degree of Bachelor of Applied Science

The degree of Bachelor of Applied Science will be awarded to students who enter the Armed Forces and who have completed 120 units of specified work. For requirements consult the Dean of the College of Engineering.

### Ceramic Engineering

Instruction in ceramic engineering, a study of the composition, fabrication and properties of nonmetallic inorganic products that require high temperature treatment at some stage in their production, is offered in the College of Engineering. This covers the industrial fields of refractories (high temperature resisting materials for furnaces and as components for jet propulsion and atomic energy devices), whitewares (porcelain, earthenware, pottery and electrical insulators including components for electronic tubes and circuits), structural clay products, glass products, porcelain enamel including high temperature protective coatings on metals, and cements, lime and plasters.

Students interested in education in ceramic engineering are advised to ob-

\* Restricted Electives: Sequence of courses to be selected with approval of counselor.

† Not required for transfer students with advanced standing if the credit includes at least 20 units or more of the courses prescribed in the freshman year. Technical units must be substituted for this course.

tain first a B.S. degree with a major in Metallurgy, Process Engineering or Chemical Engineering, including the available undergraduate courses in ceramic engineering. An additional year of study will then lead to an M.S. degree or Master of Engineering degree in Ceramic Engineering. Also, the degrees of M.S. and Ph.D. in Engineering Science for work in ceramic engineering are available. This enables those holding B.S. degrees in Chemistry, Physics, and Geology to obtain an advanced degree in ceramic engineering.

The research program at Berkeley emphasizes the exploitation and technology of California raw materials and study of ceramic composition.

A preliminary survey of the present industry in the State indicates need for a number of outstanding graduates in ceramic engineering and science together with a considerable demand for graduate instruction and research.

### **Transportation and Traffic Engineering**

Through the Institute of Transportation and Traffic Engineering various offerings are available in the fields of highways, railroad, and airport engineering. The undergraduate work is formally offered in civil engineering under the transportation option, which includes such courses as highway engineering, traffic engineering, and railroad engineering. The graduate offerings include courses in highway planning, design, and economics, traffic engineering, and highway materials and structures, and seminars in geologic engineering, highway administration and highway finance. Available in other departments of the University are courses pertinent to advanced study in the field, such as transportation economics, public administration, and city and regional planning.

### **The Coöperative Study Program in Engineering**

Under the coöperative study program an opportunity is provided for a limited number of students to obtain work experience in industry while completing their undergraduate work. This program requires five years for completion of the program for the B.S. degree as the students must complete three work periods of six months each prior to the beginning of the senior year.

Under the coöperative program the students complete their first year in the normal manner. During the following three years, students alternately work in industry six months and attend the University six months. In this three-year period the students complete the normal second- and third-year courses and obtain one and one-half years of work experience. Following the three-year coöperative period, the students complete the fourth year of study without interruption.

The number who may follow this program is limited. Students are selected upon the basis of their grades achieved in the first year and upon an interview.

During the work periods the students are not registered in the University. They are regular employees of the companies for which they are working. All jobs are regular ones, and the students receive the normal compensation for the work being done. Each student normally works all of the three periods at one company to which he has been assigned. Students start the first work period at simple, low-paid jobs, progressing to advanced work later.

Students interested in the program should apply at the Dean's Office, Engineering, during the fall semester of the first year to arrange for an interview.

### **Honors**

*Honors with the Bachelor's Degree.*—Students may receive honors with the bachelor's degree for high scholarship in the curriculum, or for distinction in the advanced work in any curriculum of the College of Engineering.

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

**COLLEGE OF PHARMACY**

The College of Pharmacy offers a four-year curriculum leading to the degree Bachelor of Science in Pharmacy and a fifth year of study which, for properly-qualified students, leads to the degree Master of Pharmacy. Admission to the four-year curriculum is predicated upon completion of the one-year pre-pharmacy curriculum. Details of the curricula leading to degrees in pharmacy are given in the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY which may be obtained from the Office of the Dean, College of Pharmacy, University of California Medical Center, San Francisco 22, California.

In addition to the above curricula, graduate courses leading to the degrees Master of Science and Doctor of Philosophy in Pharmaceutical Chemistry are open to qualified students. These programs are under the jurisdiction of the Graduate Division of the University. For details, consult the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the Graduate Division bulletin entitled ANNOUNCEMENT IN THE BIOLOGICAL SCIENCES, both of which may be obtained from the Graduate Division, University of California, Berkeley 4, California.

*Requirements for Admission.*—To be admitted to the College of Pharmacy, students must be eligible for admission to the academic colleges of the University (see pages 23-33) and must have completed, with an average grade of C or better in the University of California or in another institution of approved standing, at least 30 units of the program set forth below under the heading "Prepharmacy." Students taking the prepharmacy year at the University of California will be placed in the College of Letters and Science. If the work is not taken at the University of California, the courses selected must be equivalent to those offered at the University of California. In order to complete the prepharmacy studies in the minimum time, students should complete a full year of intermediate algebra, a course in trigonometry, and courses in elementary chemistry in the high school.

The first year of the four-year curriculum is offered on either the Berkeley or the Los Angeles campus of the University. It is the responsibility of the student to initiate the transfer from the College of Letters and Science to the College of Pharmacy following completion of the Prepharmacy year. While the course requirements for the first year of study may be satisfied at any approved collegiate institution, only the studies taken either on the Berkeley or the Los Angeles campus will count in satisfaction of the residence requirement (see below).

Students who have completed the prepharmacy studies and the requirements of the first year of pharmacy cannot be assured of admission to the second year of the pharmacy curricula on the Medical Center campus. When the number of qualified applicants for the second year of the curriculum exceeds the available facilities, selection will be made on the basis of scholarship as determined from the college record and the results of an aptitude examination. A personal interview is normally required. Application blanks for admission to the College of Pharmacy on the Medical Center campus may be obtained from the Office of Director of Admissions, University of California Medical Center, San Francisco 22, California. *Application for admission to the College of Pharmacy, University of California Medical Center campus, San Francisco, must be filed between October 1 and April 1 preceding the September of proposed admission.*

Advisers to the first-year students, College of Pharmacy at Berkeley, Mr. J. J. Eiler, Mr. D. C. Brodie and Mr. D. Kendrick, hold office hours at Berkeley during registration periods. (See the CIRCULAR FOR NEW UNDERGRADUATES concerning time and place.) At other times, Mr. Clinton C. Conrad, Assistant



Dean of Students, Office of the Dean of Students, 201 Administration Building, is adviser to the prepharmacy and first-year students on the Berkeley campus. Applications for admission, late registration, and all student petitions may be submitted to him for approval.

The adviser to the first-year students, College of Pharmacy at Los Angeles, Mr. O. A. Plunkett, may be contacted at his office in the Physics-Biology Building on the Los Angeles campus.

*Residence Requirements.*—To qualify for the California State Board of Pharmacy examinations, and to satisfy the requirements for the degree Bachelor of Science in Pharmacy, a student must have completed four years in residence in the College of Pharmacy.

Students who elect to complete the first year, together with the preprofessional year, at a junior college, state college, or other approved collegiate institution, may offer the fifth year of the curriculum on the San Francisco campus to satisfy the four-year residence requirement. Such students, providing they satisfy the minimum scholastic requirements, will receive both the degree Bachelor of Science in Pharmacy and the degree Master of Pharmacy upon completion of the fifth year. Those not satisfying the minimum scholastic requirements for the Master of Pharmacy degree will receive the degree of Bachelor of Science in Pharmacy and a Certificate of Completion (of the fifth year).

Students who register for the first year of the curriculum in the College of Pharmacy on either the Berkeley or the Los Angeles campus of the University will automatically complete their residence requirement at the end of the fourth year (third year on the San Francisco campus). At this time they may be awarded the degree Bachelor of Science in Pharmacy if they have completed all other requirements. Registration in other colleges or departments of the University will *not* satisfy any part of the residence requirement, nor may the preprofessional year of study be counted toward the residence requirement.

*Graduation.*—Candidates for the degree of Bachelor of Science in Pharmacy must have completed at least four years of residence in an accredited college of pharmacy and must have completed the curriculum of the College of Pharmacy, University of California, including at least 129 units of work, with an average grade of C or better. It should be emphasized that the four-year residence requirement can be met in the minimum time only by taking the studies of the first year of the curriculum in residence in the College of Pharmacy on either the Berkeley or the Los Angeles campus of the University.

## CURRICULUM

<i>Prepharmacy</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>First Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Chemistry 1A-1B .....	5	5	Zoölogy 1A-1B .....	4	4
Botany 12 .....	..	4	Physics 2A-2B .....	3	3
English 1A-1B or			Physics 3A-3B .....	1	1
Speech 1A-1B .....	3	3	Mathematics 16A-16B...	3	3
<sup>1</sup> Elective .....	8	..	<sup>2</sup> History 17A .....	3	..
<sup>2</sup> Elective .....	8-4	8-4	<sup>3</sup> Political Science 1 .....	..	3
Military Science .....	2	2	Military Science .....	2	2
	<hr/>	<hr/>		<hr/>	<hr/>
	16-17	17-18		16	16

<sup>1</sup> Trigonometry and intermediate algebra are prerequisite to Mathematics 16A.

<sup>2</sup> A year course chosen from foreign language, mathematics, social science, philosophy or the fine arts and selected from the courses offered in satisfaction of the (e) requirement in the College of Letters and Science (see page 62).

<sup>3</sup> If the University requirements in American History and American Institutions have been satisfied, electives may be taken.

### Master of Pharmacy

Qualified students who have received the degree of Bachelor of Science in Pharmacy, or who have completed all requirements for that degree except the residence requirement, may undertake the studies of the fifth year leading to the master's degree. Students completing the program of the fifth year with an average grade of B or better will be awarded the degree of Master of Pharmacy.

Provision is made for students who elect to take the prepharmacy year and the first year of the pharmacy curriculum at an approved institution (junior college, state college, etc.) other than a college of pharmacy. Such students can satisfy both the curricular requirements and the residence requirement by completing the work of the fifth year. Qualified students taking the fifth year of the professional program in satisfaction of the residence requirement for the bachelor's degree may be awarded the degree of Master of Pharmacy together with the degree of Bachelor of Science in Pharmacy upon completion of these studies with an average grade of B or better. Students who do not achieve a grade B average for the work of the fifth year will receive the degree of Bachelor of Science in Pharmacy and a Certificate of Completion (of the fifth year).

### SCHOOL OF BUSINESS ADMINISTRATION

The School of Business Administration, which replaced the College of Commerce on July 1, 1943, offers undergraduate and graduate curricula leading to the degrees of Bachelor of Science and Master of Business Administration.

*Admission.*—To be admitted to the School, students must have attained at least junior standing and at least a C average in one of the colleges of the University of California, or the equivalent elsewhere. Curriculum as well as unit requirements must be fulfilled in order to achieve junior standing. Evidence of superior scholarship and an acceptable bachelor's degree are required for admission to the School of Business Administration in graduate standing.

*Preparation.*—An organized program of work fulfilling the requirements for admission to junior standing in any of the colleges of the University will provide sound preparation for work in the School. Most students meet the requirements of the College of Letters and Science, thus building a broad general foundation. Students may, however, if they prefer, elect to take their lower division work in the technical colleges. For instance, those looking forward to employment in the agricultural industries or in business based closely upon these industries, might well take their lower division work in the College of Agriculture. Likewise, those wishing to work in the technical aspects of manufacturing or in industrial management could profitably spend their first two years in the College of Engineering. In general, students should choose that lower division preparation which is most closely related to the particular field and division of business administration they wish to enter.

Students entering the School of Business Administration through the College of Letters and Science may offer, in place of the full language requirement for the Associate in Arts degree, twelve units of not more than two languages and English 1A or Speech 1A; or eight units of one language and English 1A-1B or Speech 1A-1B or a combination of English 1A and Speech 1A. Students using this plan may not offer the English or Speech courses used in substitution for the foreign language in partial satisfaction of the group (e) requirement for the degree of Associate in Arts. Such students should note that they are not meeting requirements for the degree of Associate in Arts as set forth by the College of Letters and Science (see page 62).

It is highly desirable for candidates for admission to the School to complete the lower division prerequisites prior to entrance (see below). In addition to the minimum specific requirements, introductory work in economic geography and economic history is highly recommended. Students wishing to take advanced work in mathematics may elect Mathematics 3A-3B, or Mathematics 16A-16B, Analytic Geometry and Calculus, instead of Mathematics 2, Mathematics of Finance and Business. Normally, however students will take Mathematics 2, Mathematics of Finance and Business, which provides the minimum essentials for the courses in accounting, corporation finance, investments, and business administration in general.

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

The requirements for the degree of Bachelor of Science are intended to provide for all students not only a broad knowledge of the background and chief functions of modern business enterprise, but also elementary training in the use of the professional tools of accounting, statistics, and economic analysis. Since many students are unable to decide upon the specific field or position for which they wish to train, and since some shift into positions other than those anticipated, it is highly important that all have the common basis of fundamental training. On this foundation they can readily build for specific types of needs. But students are normally expected to begin to specialize by electing a field of emphasis of 9 units beyond the introductory course in one field (see below). Under the advisory procedure of the School, fields of emphasis may be approved in departments other than those listed below if the total program of the student is soundly conceived in terms of his future interests and needs. It is hoped that some students will wish to propose programs integrating work in other fields of training, such as agricultural economics, public administration, and mechanical engineering (see below).

In order to qualify for the degree of Bachelor of Science in the School, the student must have received 120 units of credit with at least a C average. All candidates for the degree of Bachelor of Science entering the School of Business Administration after attendance at other colleges or schools of this University or other institutions, with senior standing at the time of admission, are required to have been enrolled during the senior or final year in resident courses of instruction in the School of Business Administration (Berkeley). At least 24 units (12 units each semester) must be completed in this period. It is permissible to offer 12 units completed in two summer sessions of the same year as equivalent to one semester; but the student must complete in resident instruction at least one regular semester of his senior year. The candidate shall have maintained at least a C average in basic upper division courses in business administration and economics taken in residence at the University of California, and at least a C average in all courses offered in the field of emphasis taken in residence at the University of California, in satisfaction of the requirements for the degree of Bachelor of Science in business administration.

Below are listed the specific requirements for the degree of Bachelor of Science. For further information see the ANNOUNCEMENT OF THE SCHOOL OF BUSINESS ADMINISTRATION.

#### I. Prerequisite Courses:

##### A. Required:

Economics 1A-1B (Elements of Economics).....	6 units
Economics 2 (Economic Statistics).....	3
Mathematics 2 (Mathematics of Finance and Business)	3
(See above for possible substitutions)	

## B. Recommended:

Geography 5A-5B (Economic Geography).....	6
(Required of all those specializing in foreign trade)	
Economics 10 (Economic History).....	3

## II. Basic Courses:

## A. Required of all:

American History and American Institutions.....	0
Business Administration 1A-1B (Principles of Accounting) .....	6
Business Administration 18 (Business Law) .....	3
Business Administration 100 (Economics of Enterprise)...	3
Business Administration 101 (Business Fluctuations and Forecasting) .....	3
Business Administration 105 (Law of Business Organi- zation and Regulation) or 109 (Law of Negotiable Instruments and Security Devices) .....	3
Business Administration 131 (Corporation Finance)...	3
Business Administration 140 (Production Organization and Management) .....	3
Business Administration 150 (Industrial Relations)....	3
Business Administration 160 (Marketing) .....	3

30 units

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

Business Administration 135 (Economics of Insurance)	
Business Administration 170 (Transport Economics)	
Business Administration 180 (Introduction to Real Estate and Urban Land Economics)	
Economics 135 (Money and Banking)	
Economics 190A (International Economic Relations) ..	3 units

## III. Field of Emphasis:

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

The following fields of concentration are approved: accounting, banking and finance, business statistics, foreign trade, industrial management, insurance, marketing (including retailing, wholesaling, sales management, industrial purchasing, advertising, and cooperative marketing), industrial relations and personnel management, real estate and urban land economics, transportation and traffic management, and public utilities.

Students who do not wish to elect one of the above fields of concentration may receive permission to (1) fulfill the requirements of the major in the Department of Economics, (2) elect special programs with the permission of the Dean (such programs may be in other fields, for example: agricultural economics, civil engineering, electrical engineering, forestry, geography, home economics, journalism, mathematics, mechanical engineering, political science, psychology, and public administration).

It will be noted that the courses listed above under II and III total 42 units. In cases where some requirements are fulfilled by two-unit courses (e.g., by summer session courses), thus reducing the total number of units in the basic courses and field of emphasis, additional upper division courses must be completed in Business Administration or Economics or, with the permission of the Dean of the School, in closely related subjects, to raise the total to at least 41 units.

### Honors

*Honors at graduation.*—Students whose work has been of marked excellence receive honors at graduation.

### The Degree of Master of Business Administration

Normally, students should not undertake full specialization until after the completion of work for the bachelor's degree. The programs of work for the degree of Master of Business Administration will give opportunity for advanced and specialized training based upon the fundamental curriculum for the degree of Bachelor of Science. The master's degree will require a minimum residence of two full semesters after the receipt of the bachelor's degree.

For detailed information concerning the requirements see the ANNOUNCEMENT OF THE SCHOOL OF BUSINESS ADMINISTRATION (Berkeley), or the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

### SCHOOL OF CRIMINOLOGY

The School of Criminology, replacing the group major in criminology in the College of Letters and Science on July 1, 1950, offers undergraduate and graduate curricula leading to the degrees of Bachelor of Arts, Bachelor of Science, and Master of Criminology.

*Admission.*—To be admitted to the School, students must have attained upper division standing and at least a grade C average in the College of Letters and Science or the equivalent elsewhere. Evidence of superior scholarship and an acceptable bachelor's degree are required for admission to the School of Criminology in graduate standing.

*Preparation.*—In addition to fulfilling the lower division requirements of the College of Letters and Science (see pages 61–63), students must complete certain designated prerequisite courses (for exceptions to the foreign language and natural science requirements see paragraph 1 below). Some of these courses, listed below under I. *Prerequisite Courses*, are marked by asterisks indicating their acceptance in fulfillment of some of the lower division requirements. Although it is desirable that the prerequisite courses be completed prior to entrance to the School, they may be completed in the upper division.

### Requirements for the Bachelor's Degree

The bachelor's degrees in the School of Criminology are granted upon the following conditions:

1. The student must have completed the requirements for the degree of Associate in Arts except that 8 units of one modern foreign language will meet the foreign language requirement and criminalistics majors may substitute an additional 5 or 6 units of natural sciences, in excess of other natural science requirements, for one of the groups listed as (e), (4), (5), or (6).

2. The student must have received at least 120 units of credit with at least a C average. With the exception of transfer students, at least 54 units must have been completed after entrance to the School. No credit will be allowed toward the bachelor's degree for work completed at a junior college after the student has completed 66 units toward the degree. The student must have maintained at least a C average in the basic upper division courses and in the courses required for his major.

3. Students with senior standing at the time of admission to the School are required to have been enrolled during the senior or final year in resident

courses of instruction in the School. At least 24 units, including at least 18 units in upper division courses with 12 units of criminology courses, must be completed in this period. It is permissible to offer two summer sessions as equivalent to one semester; but in any event, the student must complete in resident instruction at least one regular semester of his senior year.

4. The completion of the course of study outlined below.

The requirements for the bachelor's degrees in the School of Criminology are intended to provide all students with a broad knowledge of the causes, prevention, and treatment of criminality. Special attention is given to the common problems that arise from criminal activities and the devices used by modern society in coping with them.

Three distinct fields of study are provided. Two of them deal with the application of the social sciences to (a) law enforcement, and (b) correctional work. They lead to the degree of Bachelor of Arts. The third is concerned primarily with the application of the natural sciences to law enforcement and crime investigation and leads to the degree of Bachelor of Science. Completeness of training in either field requires a combination of social and natural sciences with emphasis on one or the other.

All students in law enforcement and correctional work are required to complete the basic courses listed below. These courses provide a common basis of fundamental training on which the students may build to meet their specific interests and needs. At the time of entrance, students are expected to elect as their major field of interest either law enforcement, correctional work, or criminalistics. The first two give emphasis to the social sciences, the last to the natural sciences.

Below are listed the specific requirements for the bachelor's degrees. For further information see the ANNOUNCEMENT OF THE SCHOOL OF CRIMINOLOGY.

I. PREREQUISITE COURSES

Units

For all criminology students: American History and American Institutions; Mathematics 12* or Psychology 5 or Economics 2; Physiology 1*; Psychology 1A* .....	9 plus
For students majoring in law enforcement or correctional work: Sociology 1*-2*; Political Science 1*-2*; Psychology 1B or 3 or 33 .....	15
Students are urged to take wrestling, boxing, and judo.	
For students majoring in criminalistics: Chemistry 1A*-1B*, 5*, 12; Physics 2A*-2B*, 3A*-3B*; Physiology 1L* .....	28

II. BASIC COURSES (required of all students in Law Enforcement and Correctional Work)

†Criminology 100A-100B (Crime Causation, Prevention, and Correction) .....	6
Criminology 101 (Crime Investigation) .....	2
†Criminology 103 (Psychological Aspects of Criminology) .....	3
†Criminology 105A-105B (Police Administration) .....	6
Criminology 115A-115B (Legal Relations Involved in Criminology) .....	6
Criminology 161 (Psychiatric Aspects of Criminology) .....	3
Criminology 162 (Therapeutic Theories in Preventive Criminology) .....	3
Criminology 163 (Interrogation and Detection of Deception)....	4

\* May be accepted in partial fulfillment of requirement (a), College of Letters and Science (see page 62).

† Courses that should be taken in the junior year to avoid conflict in senior year.

## III. MAJORS (Students must complete the courses in one major)

*Law Enforcement:* Adviser: Mr. Kelley.

	Units
Criminology 107 (Personal Identification) .....	3
†Criminology 111 (Physical Evidence) .....	2
Criminology 113 (Legal Medicine) .....	3
Criminology 171 (Police Planning) .....	2
Transportation Engineering 190 (Police Traffic Engineering)...	2
Electives: .....	6

Anthropology 150A-150B; Business Administration 121A-121B, 125, 140, 150, 151, 152, 191; Economics 104, 113, 142, 150, 180; Mathematics 120A-120B; Physiology 104; Political Science 100A, 102A, 105A, 111A, 113, 157A-157B, 160A-160B, 181, 183, 184; Psychology 102A-102B, 104, 112, 120, 145, 146A-146B, 148A-148B, 180, 186; Public Health 186; Speech 107A-107B, 110A-110B; Social Welfare 100, 110A-110B; Zoölogy 115; and for seniors who have met the requirements for admission to graduate courses, Criminology 291A-291B, 292, 293A-293B, 296A-296B; Political Science 261A-261B, 273, 281A-281B; Social Welfare 201, 257A-257B, 262.

*Correctional Work:* Adviser: Mr. MacCormick.

Criminology 182 (Institutional Treatment of the Criminal and Delinquent) .....	2
Criminology 184 (Noninstitutional Treatment of the Criminal and Delinquent) .....	2
Social Welfare 100 (The Field of Social Welfare) .....	3
Electives .....	9

Agricultural Economics 112A-112B; Anthropology 118A-118B, 125A-125B; Business Administration 140; Economics 106A-106B, 113, 121A-121B; Education 110, 111, 160, 164, 181; Home Economics 121, 142; Philosophy 108; Physical Education 131A-131B; Political Science 102A, 103A, 104A, 105A, 181, 183; Psychology 112, 113N, 141, 145, 165, 185; Public Health 110, 125, 131, 135; Social Welfare 102, 201; Sociology and Social Institutions 102, 115, 130, 160, 178.

*Criminalistics:* Adviser: Mr. Kirk.

Criminology 100A (Crime Causation, Prevention, and Correction) .....	3
Criminology 101 (Crime Investigation) .....	2
Criminology 103 (Psychological Aspects of Criminology) .....	3
Criminology 105B (Police Administration) .....	3
Criminology 107 (Personal Identification) .....	3
Criminology 111 (Physical Evidence) .....	2
Criminology 113 (Legal Medicine) .....	3
Criminology 115A-115B (Legal Relations Involved in Criminology) .....	6
Criminology 151 (Microchemical Testing of Physical Evidence) ..	5
Criminology 153 (Advanced Techniques in Evidence Examination) ..	3
Criminology 155 (Comparative Microscopy) .....	3
Biochemistry 102 (A Brief Survey of the Principles of Biochemistry) .....	3
Chemistry 112C (Organic Chemistry) .....	3
Forestry 114 (Wood Technology) .....	3
Public Health 172 (Industrial Toxicology) .....	2

† Courses that should be taken in the junior year to avoid conflict in senior year.

Zoölogy 119A-119B (Optics and Metrology in Biology).....	4
Recommended: Anthropology 150A-150B; Biochemistry 107; Botany 108; Chemistry 100, 105, 109, 115, 125; Criminology 157, 161 and 163; Geology 103, 104A-104B; Mathematics 3A-3B, 113; Philosophy 30; Physiology 100A-100B; Speech 110A-110B; Zoölogy 114.	

*Precriminology Curricula.*

The following programs of study are suggested to students preparing to enter the School of Criminology.

*Social Science Program:* Counselor: Mr. Kelley.

<i>First Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
<sup>1</sup> Subject A and American History and American Institutions	..	..
Military Science .....	2	2
<sup>2</sup> English 1A-1B or Speech 1A-1B.....	3	3
<sup>3</sup> Foreign Language .....	4	4
Year Course (See requirement (e) for degree of Associate in Arts) .....	3	3
Political Science 1, 2 .....	3	3
	—	—
	15	15
 <i>Second Year</i>  		
Military Science .....	2	2
<sup>3</sup> Foreign Language .....	4	4
Physiology 1 .....	3	..
<sup>4</sup> Psychology 5 or Economics 2 or Mathematics 12.....	..	3
Sociology 1, 2 .....	3	3
Requirement (d) for degree of Associate in Arts.....	variable	variable
Psychology 1A, 1B or 3 or 33.....	3	3
	—	—
	15 plus	15 plus

*Natural Science Program:* Counselor: Mr. Kirk.

<i>First Year</i>		
<sup>1</sup> Subject A and American History and American Institutions requirement .....	..	..
Military Science .....	2	2
Chemistry 1A-1B .....	5	5
<sup>2</sup> Speech 1A-1B or English 1A-1B .....	3	3
<sup>3</sup> Foreign Language .....	4	4
Psychology 1A; 1B, or 3 or 33.....	3	3
	—	—
	17	17

<sup>1</sup> For regulations concerning Subject A see page 36. For American History and American Institutions see page 37.

<sup>2</sup> Students who are required to take the course in Subject A are advised to substitute in place of English 1A-1B or Speech 1A-1B, courses that partially fulfill requirement (e) for the degree of Associate in Arts.

<sup>3</sup> Foreign Language: The School of Criminology 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 foreign languages. These may be satisfied partly in high school.

<sup>4</sup> Mathematics 12 partially fulfills the mathematics choice in requirement (e) for the degree of Associate in Arts (see page 62).



	<i>Second Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Military Science .....		2	2
Chemistry 5 .....		..	3
Chemistry 12, 112C .....		5	3
Physiology 1, 1L .....		5	..
Physics 2A-2B .....		3	3
Physics 3A-3B .....		1	1
* Mathematics 12 (or Economics 2 or Psychology 5) .....		..	3
		<hr/> 16	<hr/> 15

The following programs of study are suggested to Criminology students.

#### LAW ENFORCEMENT

##### *Junior Year*

Criminology 100A-100B  
Criminology 101  
Criminology 103  
Criminology 105A-105B  
Criminology 161  
Criminology 162  
Criminology 111

##### *Senior Year*

Criminology 115A-115B  
Criminology 107  
Criminology 113  
Criminology 163  
Criminology 171

#### CORRECTIONAL WORK

##### *Junior Year*

Criminology 100A-100B  
Criminology 101  
Criminology 103  
Criminology 105A-105B  
Criminology 161  
Criminology 162

##### *Senior Year*

Criminology 115A-115B  
Criminology 163  
Criminology 182  
Criminology 184  
Social Welfare 100

#### CRIMINALISTICS

##### *Junior Year*

Criminology 100A  
Criminology 101  
Criminology 107  
Criminology 111  
Criminology 113  
Criminology 151  
Criminology 155  
Biochemistry 102  
Zoölogy 119A-119B

##### *Senior Year*

Criminology 103  
Criminology 105B  
Criminology 115A-115B  
Criminology 153  
Forestry 114  
Public Health 172

*Honors at Graduation.*—Students whose work has been of marked excellence receive honors at graduation.

### The Degree of Master of Criminology

Opportunity is offered for graduate study in criminology leading to the degree of Master of Criminology. Advancement to candidacy presupposes the completion of undergraduate requirements in criminology equivalent to those prescribed at the University of California. Except for making up deficiencies

\* Mathematics 12 partially fulfills the mathematics choice in requirement (e) for the degree of Associate in Arts (see page 62).

in the undergraduate requirements, the graduate student's program may be planned largely to meet his individual needs and interests. Students who have completed the work for the bachelor's degree in the School of Criminology should be able to complete the requirements for the degree of Master of Criminology in one year.

## SCHOOL OF EDUCATION

The School of Education offers professional courses intended for students preparing for educational service in elementary, junior and senior high schools, and colleges; for graduate students who are fitting themselves for supervisory or administrative positions in public schools; and for students who propose to engage in school administration, to teach in state colleges or in university departments of education, or to carry on research work in the field of education.

### GENERAL REQUIREMENTS IN TEACHER EDUCATION

The students must satisfy the following general requirements to complete a curriculum leading to a recommendation for a teaching credential.

*Scholarship.*—The School of Education will admit to candidacy for recommendation only those students who have maintained a grade-point average of not lower than 1.5 in all studies undertaken in the junior and senior years since reaching junior standing. Students with grade-point shortages may apply to the Director of Supervised Teaching for consideration and advice.

*Oral English.*—The student must prove that he has a command of spoken English adequate to the purposes of instruction. He may satisfy this requirement by examination, by completing suitable courses in the Department of Speech, or by any other test satisfactory to the Committee on Oral English.

*Health Certificate.*—The student must take a medical examination and obtain a satisfactory certificate from the University Physician.

*Age.*—Applicants without teaching experience who are over 35 years of age will not ordinarily be admitted to supervised teaching.

*Citizenship.*—Each applicant for a credential is required by the State Department of Education to be a citizen of the United States. Noncitizens who have filed their first papers are eligible to apply for short-term credentials. Failure to complete the naturalization process within six months of the date of eligibility will result in the revocation of the credential. After a foreign student has become naturalized he may apply for a long-term credential.

*Oath of Allegiance.*—The State Department of Education also requires each applicant for a credential to take an oath of allegiance to the United States and to submit identification cards showing fingerprints.

*The Constitution of the United States.*—The State Department of Education requires the completion of a course on the provisions and principles of the Constitution of the United States. This requirement may be satisfied by completing one of the following sequences: History 17A–17B; 171A–171B; 172A–172B; Political Science 157A–157B; or one of the following courses: Political Science 1; 100A; 113.

*Approval of Schedules.*—For information concerning credential requirements the student should consult a counselor in the Student Personnel Services, 103 Haviland Hall, as early as possible in his academic career.

Each prospective candidate for a teaching credential must file an application for admission to graduate standing with the Dean of the Graduate Division, 102 Administration Building, at least eight weeks before the opening of

\* These requirements may be satisfied by passing the examination in American History and American Institutions. See statement on page 37 concerning this requirement.

the semester in which he plans to enroll as a graduate student. This application must be accompanied by a bank draft or money order for the \$5 application fee, which is payable to The Regents of the University of California. The transferred graduate student must furnish a transcript of his college or university work both to the Dean of the Graduate Division and to the Dean of the School of Education when he files his office record card. On the basis of transferred records the Dean of the Graduate Division issues a statement of the student's official status. The student must present this statement when he files his office record card. His study list cannot be approved until the latter has been filed.

*Application for Credential and for Supervised Teaching.*—Detailed schedules of procedures may be obtained in 106 Haviland Hall. Applications for supervised teaching (Education 320A, 320C, 323, 324, 330A and 330C) must be made in 106 Haviland Hall not later than November 1, 1954, for the spring semester, 1955, and not later than April 4, 1955, for the fall semester, 1955. Enrollment is limited to available facilities.

Students planning to enroll in supervised teaching (Education 320A, 320C, 320E, 323, 324, 330A, and 330C) should note that these are extra-session courses, in which instruction begins with the beginning of the semester in the public schools and ends at the close of the semester in the public schools. In the fall semester, 1954, instruction in these courses in most cases will begin on September 13, 1954, and end on January 28, 1955; in the spring semester in most cases, it begins on February 2, 1955, and ends on June 17, 1955.

*Application to the State Department of Education.*—The application to the State Department of Education for a teaching credential must be accompanied by a health certificate (the fee for which is \$5, payable at Cowell Memorial Hospital); duplicate personal identification (fingerprint) cards; and money order, certified check, or cashier's check for \$4, the application fee, made payable to the State Department of Education.

#### SPECIFIC REQUIREMENTS

##### The General Secondary Credential

*Counselors:*—Students may consult one of the following counselors: Mr. C. C. Conrad, 106 Haviland Hall; Mr. T. B. Edwards, 111 Haviland Hall; Mr. W. D. Loban, 108 Haviland Hall; Mr. S. E. T. Lund, 110 Haviland Hall.

*Requirements:*—The candidate for the recommendation for this credential must satisfy the following specific requirements, in addition to the general requirements described on pages 121–122.

1. He must spend two graduate semesters at this University during which he completes a minimum of 24 units of upper division and graduate work with a grade-point average of not lower than 1.75. At least 6 of these units must be in graduate courses, or in upper division courses accepted by the School of Education as substitutes for graduate courses, in the fields of the teaching major or minor, or both. (In order to maintain graduate residence for higher degrees, the student must take at least 4 units in upper division or graduate courses in the semester in which he is enrolled in Education 320A or 320C.)

2. He must complete with a scholarship average of at least one grade point the following 22 units in Education (the State Department of Education requires that at least 6 units in Education courses be completed in the graduate year):

Education 110 (Educational Psychology) . . . . .	3 units
Education 111 (Growth and Development of Children) . . . . .	2
Education 170 (Secondary Education) . . . . .	2
Electives in Education . . . . .	3–5

Education 320A (Supervised Teaching) .....	3
Education 320B (Audio-Visual Instruction: Materials and Techniques) .....	2
Education 320C (Supervised Teaching).....	3
Education 320E (Professional Methods).....	2-4
Total.....	22 units

The candidate should note the following:

- (a) Students are advised to distribute these courses over the junior, senior, and graduate years as follows: Education 110 and 111 in the junior year; Education 170 and 320B in the senior year; Education 320A, 320C, and 320E in the graduate year. Education 320B may be taken concurrently with Education 320A in the graduate year. There are definite advantages in so doing, provided that ample time be left free for supervised teaching.
- (b) Psychology 1A or its equivalent is prerequisite to these courses.
- (c) Credit in courses offered in the Department of Education for a teacher's credential may not be obtained by examination.

3. He must complete a teaching major and a teaching minor selected from at least two of the following fields of University studies:†

- (1) Agriculture
- (2) Art
- (3) Business education
- (4) English or speech
- (5) Foreign language (French or German or Italian or Latin or Spanish).
- (6) Homemaking
- (7) Librarianship
- (8) Life science
- (9) Mathematics
- (10) Music
- (11) Physical education
- (12) Physical science
- (13) Social studies\*

*The Teaching Major.*†—There are two kinds of teaching majors. The first consists of 36 units of which 18 to 24 units are completed in upper division and/or graduate work, the precise amount to be agreed upon by the School of Education in consultation with the subject representative in the department or departments concerned (ordinarily 18 units of the teaching major shall be selected from the departmental major for the bachelor's degree). The second consists of a minimum of 36 units of upper division and/or graduate work in two or more related subjects (e.g., social studies), this major being fixed by the School of Education in consultation with the subject representatives of the departments concerned. In addition to the foregoing minimum requirements, the School of Education will prescribe such graduate courses designed for teachers as may be organized by the various departments; and, in agreement with the subject representative, such other courses, either graduate or undergraduate, as may be found necessary, provided the total number of units required for any subject does not exceed 36.

\* There is no "social studies" major for the A.B. degree in the College of Letters and Science. An applicant wishing to offer a teaching major in the "social studies" ordinarily would have as his A.B. major some aspect of the social studies, such as history, economics, political science, etc., or a group major, or units in the social sciences in a general (nonmajor) curriculum.

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

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

*The Teaching Minor.*—The teaching minor in any subject consists of not less than 20 units, ordinarily in a department or field of studies other than the teaching major. Not less than 9 units of this total shall consist of upper division and/or graduate courses (except as recommended by the department or departments concerned to the School of Education).

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

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

### The Junior College Credential

*Counselor:* Mr. C. C. Conrad, 106 Haviland Hall.

*Requirements.*—The candidate for the recommendation for this credential must fulfill the specific requirements listed below, in addition to the general requirements described on pages 121–122.

1. He must complete two semesters of work in residence at this University.

2. He must hold a master's or doctor's degree from this University, or from another institution recognized as equivalent by the Graduate Division, in one of the following fields of study: agriculture, anatomy, anthropology, architecture, art, astronomy, bacteriology, botany, business administration, chemistry, child development, comparative literature, decorative art, economics, engineering, English, forestry, French, geography, geology, German, Greek, history, home economics, Italian, Latin, librarianship, mathematics, mining and metallurgy, music, paleontology, philosophy, physical education, physics, physiology, political science, psychology, sociology and social institutions, Spanish, zoölogy. The major for the master's or doctor's degree is recognized as the teaching major if it is in one of the above fields.

3. He must complete an approved teaching minor in one of the above fields or in a field chosen from the list of teaching majors for the general secondary credential (page 123).

4. He must complete with a scholarship average not lower than one grade point at least 12 units in education courses, including:

Educational Psychology—Education 110.....	2–3 units
The Junior College—Education 279.....	2
Supervised Teaching and Professional Methods:	
(a) Teaching assistants on the campus will take Education 320B, 324, Section 1, and 320E, Section 16 .....	8
(b) All other students will take Education 320B, 324, Section 2, and 320E, Section 16.....	8
Total .....	12–13 units

5. He must maintain the following scholarship ratings in the various classifications of his work:

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

6. Before final action is taken by the School of Education concerning the recommendation for the junior college credential, the candidate must present a report concerning his attainments and fitness from the professor in charge of his higher degree program. In the case of students transferring with higher degrees from other institutions, the chairman of the department in question at the University of California should be asked for such a recommendation.

**The General Elementary Credential**

*Counselors:* Mr. Barnett, 314 Haviland Hall; Mr. Dumas, 106 Haviland Hall; Mr. Michaelis, 316 Haviland Hall; Mr. Russell, 315 Haviland Hall.

*Requirements.*—The candidate for the recommendation for this credential must satisfy the following specific requirements, in addition to the general requirements described on pages 121–122.

1. He must hold a bachelor's degree from one of the academic colleges of this university or its equivalent.

2. He must take one semester of graduate work.

3. He must maintain the following scholarship ratings in the various classifications of his work:

Upper division work: a grade-point average of at least 1.50

Postgraduate work: a grade-point average of at least 1.50

Education courses: a grade-point average of at least 1.00

Work for the major: a grade-point average of at least 1.00

Work for the minor: a grade-point average of at least 1.00

4. He must complete with a scholarship average of not lower than one grade point the following courses:

	Units
Introduction to Educational Psychology—Education 110.....	3
Growth and Development of Children—Education 111.....	2
Elementary Education—Education 130.....	3
Arithmetic and Language in the Elementary School—Education 131.	2
Art and Music in the Elementary School—Education 132.....	2
Reading and Literature in the Elementary School—Education 134...	2
Social Studies in the Elementary School—Education 138.....	2
Supervised Teaching, Professional Methods—Education 330A*, 330C*, 330E .....	10
Supervised Teaching: Materials of Instruction and Class Manage- ment—Education 331 .....	2
 Total .....	 28

*5. Recommended Sequence of Courses:*

• Low junior semester: Education 110 and Education 130. These courses are prerequisite to Education 131, 132, 134, 138, and 330A.

High junior semester: Education 111 and one of the following: Education 131, 132, 134, 138.

Low senior semester: Two of the following: Education 131, 132, 134, 138.

High senior semester: One of the following: Education 131, 132, 134, 138, and Education 330A\* which is prerequisite to Education 330C, 330E, and 331.

Graduate semester: Education 330C\*, 330E, 331. (One additional course may be added on consent of the adviser.)

\* Application for enrollment in Education 330A and 330C must be filed in Room 106, Haviland Hall, not later than November 1, 1954, for the spring semester, 1955, and not later than April 4, 1955, for the fall semester, 1955.



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

- (a) Art or decorative art
- (b) English and speech
- (c) Foreign language
- (d) Home economics
- (e) Mathematics
- (f) Music
- (g) Natural science
- (h) Physical education
- (i) Social studies
- (j) Psychology, with emphasis on child and clinical psychology
- (k) Group majors chosen from: American civilization, American literature, child development, communications and public policy, East Asiatic studies, international relations, labor and industrial relations, physical education, recreation, sociology, social welfare, wildlife conservation. In each case the major must be approved by the Director of Supervised Teaching.
- (l) Regional group majors chosen from: China, Hispanic America, Russia and Eastern Europe. In each case the major must be approved by the Director of Supervised Teaching.
- (m) Any other major for the A.B. degree in the College of Letters and Science, the content of which is primarily related to the elementary school curriculum, may be accepted, provided that application for acceptance be made to the Committee on Admission to Supervised Teaching and be approved by the Committee.

*Courses taken in fulfillment of a major cannot be used to satisfy the minor requirement.*

A major for this credential consists of the departmental major offered in satisfaction of requirements for the A.B. degree; or, the 36-unit general (non-major) curriculum offered in satisfaction of requirements for the A.B. degree may be offered in lieu of the departmental major provided it includes at least 24 units in one of the fields listed above, 12 of which are in upper division.

A minor consists of 12 units, at least 6 of which are in upper division courses.

7. Other courses required for this credential:

Psychology 1A, General Psychology (3).

Decorative Art 6A, Theory of Design and Color (2).

Physical Education 26, Physical Education Activities (Section on Elementary School Skills) ( $\frac{1}{2}$ ).

Music 10, Basic Musicianship (2); Music 27A, Introduction to Musical Literature (3) is strongly recommended.

History 189A or 189B, History of California (2).

### **The General Junior High School Credential**

*Counselors:* Mr. Barnett, 314 Haviland Hall; Mr. Dumas, 106 Haviland Hall; Mr. Michaelis, 316 Haviland Hall; Mr. Russell, 315 Haviland Hall.

The student must complete the courses specified above for the General Elementary Credential and in addition complete the following course:

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

The candidate for this credential must present a major and a minor in fields commonly taught in junior high schools and must complete an assignment in supervised teaching on the junior high school level.

### SCHOOL OF FORESTRY

The School of Forestry, which replaced the curriculum in forestry of the College of Agriculture, July 1, 1946, offers undergraduate and graduate curricula leading to the degrees of Bachelor of Science, Master of Forestry, and Master of Science.

#### ADMISSION TO THE SCHOOL OF FORESTRY

Candidates for admission to the School of Forestry must qualify in the following ways:

- A. Completion of at least 60 units of work in one of the colleges of the University of California, preferably the preforestry curriculum of the College of Agriculture; or admission to the University in junior standing. In all cases junior standing requires the completion of 60 units of work acceptable to the Board of Admissions of the University.
- B. The candidate must have the following preparation for courses in the curriculum of the School of Forestry:\*

	Units
1. Botany (general botany) .....	5
(This requirement is based on Botany 1 as given at Berkeley. In institutions where such a concentrated course is not available, a year course in general botany is required.)	
2. Chemistry (general inorganic, and organic) .....	8
3. Engineering (plane surveying) .....	6
4. Economics (elements of economics) .....	6
5. Geology (structural) .....	3
6. Mathematics (analytic geometry and differential calculus) .....	6
7. Physics (general physics with laboratory) .....	8
8. Statistical methods .....	3
9. Zoölogy (general biology) .....	3
10. A choice of English or speech .....	6
Total .....	54

- C. No student with a grade-point average of less than one (C average) will be admitted.

#### REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE

Undergraduate students must complete the following requirements for a bachelor's degree:

1. The equivalent of eight semester's residence, the senior year of which must be spent at this University.
2. One hundred twenty-four units of study with 124 grade points, exclusive of the field practice course, Forestry 49. Thirty-six of the 124 units must be in upper division courses, and at least 60 units must be completed in the School of Forestry. This total of 60 units, however, may be reduced in the case of students admitted to the School with advanced standing.

\* If applicants are otherwise qualified they may be admitted to the summer field practice course, Forestry 49, and the School of Forestry with certain subject shortages in this list. No listing of specific permissible shortages can be made as they depend upon the practicability of the student carrying a full program of required forestry courses concurrently with the removal of shortages in preforestry requirements. This must be determined for each individual case. Nevertheless, it may be said that shortages of over 12 units in the subjects listed, or a shortage of either general botany or Engineering 1A, will make it impossible for a student to take Forestry 49 or to be admitted to the School of Forestry. Students desiring further information should communicate with the School of Forestry, University of California, Berkeley 4.



3. The removal of any deficiencies in the following courses usually taken in high school: mathematics, 3 years, including plane geometry, algebra, and trigonometry.

4. An examination in English composition known as Subject A. Students who fail in this examination are required to take the course in Subject A, which yields no unit credit toward the degree and for which a fee of \$20 is charged.

5. The University requirement of American History and American Institutions, either by examinations or by passing certain specified courses.

6. The University requirement of 8 units of Military Science and Tactics.

7. The field practice course, Forestry 49, in camp at Meadow Valley, near Quincy, in the Plumas National Forest.

8. In addition to requirements 3 and 5 above, University preforestry courses as listed above for admission to the School, and courses in the School of Forestry as follows:

	Units
1. Botany (plant physiology with laboratory).....	4
2. Economics or business administration (other than statistics) .....	3
3. Plant pathology or taxonomic botany.....	3
4. Soil science .....	4
5. Zoölogy, upper division, or entomology.....	3
6. Forestry courses at Berkeley (including Forestry 100, 103, 104, 108, 110, 120, 128, and either 121A, 121B, 122, or 126) .....	34

#### PLAN OF STUDY

##### The Curriculum of the School of Forestry

A single curriculum is offered in the School of Forestry, arranged to give a solid broad training and at the same time to permit specialization. In view of the limited number of specialized positions that are annually available, undergraduate work should remain broad and general; otherwise a man may prepare himself for a particular field in which there may be no opening for many years.

##### Preforestry

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

##### Freshman Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Chemistry 1A .....	5	Chemistry 8 .....	3
Geology 1.....	3	Zoölogy 10 .....	3
Speech 1A or English 1A .....	3	Speech 1B or English 1B.....	3
Mathematics 16A .....	3	Mathematics 16B .....	3
Military Science .....	2	Military Science .....	2
	16		14

## Sophomore Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Physics 2A, 3A .....	4	Physics 2B, 3B .....	4
Engineering 1A† .....	3	Engineering 1B .....	3
Economics 1A .....	3	Economics 1B .....	3
Botany 1* .....	5	Statistics .....	3
Military Science .....	2	Military Science .....	2
	17		15

In the summer following his sophomore work, the student must attend the field practice course, Forestry 49. *This course is prerequisite to all required courses in the School of Forestry.* See below for further information.

## Junior Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Forestry 100 .....	3	Forestry 110 .....	4
Forestry 103 .....	3	Forestry 128 .....	3
Forestry 108 .....	4	Botany 111 .....	4
Elective .....	6	Plant Pathology 100 or Botany 108 .....	3 or 4
	16	Elective .....	3
			17 or 18

## Senior Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Forestry 104 .....	4	Forestry 120 .....	4
Soil Science 100 .....	4	A course in economics .....	3
Zoölogy 116 or Entomology 114 .....	4 or 3	Electives .....	9
A course in forest economics...	3		
Elective .....	3		
	18 or 17		16

## Field Practice Course

Students majoring in forestry are required to attend, after completing their sophomore work, the summer field practice course (Forestry 49), which is conducted in the Summer Camp of the School of Forestry, at Meadow Valley, near Quincy, in the Plumas National Forest, a leading timber-producing area of the State. Approximately eleven weeks are spent in field work—land surveying, timber surveying, timber estimating, forest mapping, and scaling; in the study of silviculture and tree growth; and in examining logging and milling operations.

\* Students who prepare for forestry at other institutions which do not offer a one-semester course in botany (equivalent to Botany 1) should take a general botany course. This does not take the place of 4 units of plant physiology with laboratory (Botany 111).

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

## GRADUATE STUDY

### The Master's Degree

Opportunity is offered for graduate study in forestry leading to the degree of Master of Science, under Plan I, or Master of Forestry, under Plan II.

The degree of Master of Science requires 20 units of upper division and graduate courses, of which at least 8 units must be strictly graduate work in the major subject, and the satisfactory completion of a thesis. The degree of Master of Forestry requires 24 units of upper division and graduate courses, of which at least 12 units must be in strictly graduate courses in the major subject, and a comprehensive final examination.

Advancement to candidacy for either degree also presupposes the completion of undergraduate requirements in forestry equivalent to those prescribed at the University of California. Except for making up deficiencies in the undergraduate requirements, the graduate student's program may be planned largely to meet his individual needs and interests. The arrangement is flexible enough that the student may either include a broad preparation for professional work or specialize and give a greater part of his time to a specific problem.

### The Doctor's Degree

Study and research on a suitable problem in forestry leading to the degree of Doctor of Philosophy may also be undertaken. For training in silviculture, forest ecology, range management, or forest influences, the program ordinarily would be administered by the Plant Physiology or Soil Science group, which include members of the forestry teaching staff. For training in forest economics or management, the candidate would usually work with the Department of Agricultural Economics. The program would include the fulfillment of the minimum requirements of the group or department, together with research and a dissertation on a forest problem appropriate to the combined fields of forestry and plant physiology, or forestry and soil science, or forestry and economics, depending on the individual student's choice.

## SCHOOL OF LAW

### Preparation for the Study of Law

For the guidance of students who may become applicants for admission to the School, the essentials of a satisfactory prelegal education are summarized as follows:

In the first place, *the prelegal student should follow a plan of study which will assure adequate foundations for broad culture.* Such a plan should include among its objectives: (1) a well-grounded facility in the use of English, written and spoken, and a wide acquaintance with the best of English literature; (2) a familiarity with at least the outlines of human history and a thorough knowledge of the history of our own country and people; (3) an acquaintance with the great philosophers and an understanding of the progress and significance of philosophic thought; (4) a mastery of elementary logic and mathematics and some acquaintance with their application in contemporary life; (5) an introduction to natural science and an appreciation of its tremendous importance in the modern world; and (6) a thorough knowledge of the elements of social science, including the essentials of economics, government, psychology, and other important social studies. Foundations much be laid in high school for the study of English, history, mathematics, and natural science. The prelegal student normally will be well advised to defer philosophy and the social studies until he has entered college. If prelegal study is planned effectively, the foundations for a broad culture may be laid in high school and in the first two years of college.

In the second place, the *prelegal student should acquire the intellectual discipline and experience which are to be derived from intensive work for a substantial period of time in a selected field of study.* This work should be carefully planned, and a special competence should be achieved in the selected field. It has often been found that a well-chosen group of courses in economics may be related effectively to later professional study in law. An effective pre-professional training may also be planned with emphasis upon political science, history, business administration, psychology, English, philosophy, or similar fields. College courses in commercial or business law, planned primarily for non-prelegal students, should be included in the prelegal program only when they are prerequisite to other college work.

In the third place, the *prelegal student should begin the cultivation of professional standards of study as early as possible.* Few ideas are more fallacious or harmful than the notion that it is possible to dawdle through high school and college and then make the adjustment to high standards promptly upon entering the professional school. Essential habits of concentration and effective methods of study must be acquired and developed during the prelegal years. Careful reading and constant exercise of practice in writing should be cultivated assiduously. Intelligently selected private reading should supplement the work of the classroom at all times. The law as a process of social adjustment is reflected in all aspects of life, and the student who carelessly wastes the opportunities of his prelegal years cannot possibly present himself well prepared for professional training. A large proportion of failures in the professional school may be traced directly to the neglect of opportunities in high school and college. Distinguished achievement in high school and college is usually followed by distinction in the professional school and in later law practice.

It is suggested that every prelegal student learn to use a typewriter.

Copies of a memorandum (designed primarily for prelegal students at the University of California, Berkeley) entitled "Recommended Courses for Prelegal Students" may be obtained from the Office of the Dean, School of Law, Berkeley 4. The offices of the prelegal advisers are located in the School of Law Building. Prelegal students are not required to discuss their programs with a prelegal adviser, but those who have special problems should not hesitate to seek advice.

### Law School Admission Test

The School of Law is cooperating with the Educational Testing Service and with other law schools in the development and administration of a uniform Law School Admission Test. The test is designed to measure aptitude for professional study, rather than knowledge of subject matter, and no special preparation is necessary. Centers where the test may be taken have been established for the convenience of applicants in all parts of the country. *The test is required of all applicants for admission to this School and should be taken during the academic year preceding the one for which admission is sought.* For application procedures see Admission Procedure, page 132.

The Educational Testing Service will supply each applicant with a bulletin of information giving details with respect to administration and including practice questions. All questions concerning the Law School Admission Test should be addressed directly to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey.

### Admission to the Professional Curriculum

Applicants for admission to the professional curriculum of the School of Law, leading to the degree of Bachelor of Laws, must have received the degree of Bachelor of Arts or Bachelor of Science from the University of California,

or an equivalent degree from a college or university of approved standing. The program of study leading to the degree should be in substantial conformity with the essentials of a satisfactory prelegal education (see page 130).

Applicants who have achieved a 2.0 (B) average in the work of the last two prelegal years may be admitted unless their scores on the Law School Admission Test are so low as to demonstrate a lack of capacity for the work of the professional curriculum.

Applicants having less than a 2.0 average, but at least a 1.5 (C+) average, may be admitted if they give sufficient evidence through their scores on the Law School Admission Test, or otherwise, of capacity for the work of the professional curriculum. Such applicants may be asked to present themselves at the School for personal interviews before admission is granted.

Applicants must also submit satisfactory references as to character, including the names and addresses of not fewer than three disinterested and responsible persons to whom the applicant is well known and to whom the faculty may appropriately address inquiries with respect to the applicant's character. Wherever possible, the character references should include a member of the Bar who is a graduate of the School of Law or of another law school approved by the American Bar Association.

Applicants who have completed at least one year of work in another law school may be admitted to the second year of the professional curriculum with credit for not more than one year of such work if (1) the applicant would have been eligible for admission to the first year in this School, (2) the work has been completed in a school which is a member of the Association of American Law Schools, and (3) the work for which credit is sought has been of superior grade. The faculty reserves the privilege of prescribing further conditions for the granting of such credit and may, in its discretion, require examinations in subjects for which credit is sought.

Students who have been disqualified at another law school will not be admitted to this School.

The professional curriculum is so arranged that beginning students must enter the School at the opening of the fall semester. To be assured of satisfactory programs, students transferring from other law schools should also plan to enter at the opening of the fall semester.

#### **Admission Procedure\***

1. The initial application for admission to the School of Law should be made on forms which will be supplied by the School and should be addressed to the School of Law, University of California, Berkeley 4. It should be accompanied by transcripts of all college, university, or professional school records other than the records of work completed at the University of California, Berkeley. Where the applicant is currently in a college or university, the transcripts should cover all work completed to date and should be accompanied by a statement indicating the time when it is expected that the work pending will be completed and the necessary supplemental transcripts supplied. To insure consideration of an application for admission in September, 1955, the initial application should be received by the School by July 1, 1955. Actual receipt of the initial application by the School is the applicant's responsibility. In no circumstances should the initial application be addressed to another department or office of the University.

2. Applicants are also required to apply for admission to the Graduate Division. This application should be made on forms which will be supplied by the Graduate Division and should be addressed to the Graduate Division, University of California, Berkeley 4, accompanied by a remittance in the sum of \$5 payable to The Regents of the University of California. The remittance of

\* The procedure herein applies to the class entering in the fall semester of 1955.

\$5 is not required of veteran applicants who expect to enroll under the provisions of Public Law 346 (the G. I. Bill of Rights) or Public Law 16. Persons governed by Public Law 550 ("Korean" G. I. Bill) must pay this fee from their allotment. This application must also be accompanied by official transcripts of record other than the records of work completed at the University of California, Berkeley. Such transcripts are in addition to those accompanying the initial application to the School of Law. Since applicants cannot be admitted to the School until they have been admitted to graduate standing, the application should be filed by July 15.

3. For permission to take the Law School Admission Test, applicants will write directly to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey, requesting an application blank and bulletin of information listing places where the test may be taken and the dates on which the test will be given. If the applicant so requests on the test application form, his score will be reported not only to this law school but also to other law schools where he may be applying for admission. He will also receive an individual score report directly from the Educational Testing Service.

### **Admission to the Graduate Curriculum**

The student who desires (1) to broaden his professional education by study of legal history, international and comparative jurisprudence, or the relations of law and other social sciences, or (2) to supplement his professional education by study of special subjects (e.g., taxation, labor law, international law, marital property, procedure, corporations), or (3) to get special training in preparation for law teaching, legal research, government service, or legislative drafting, may become a candidate for the degree of Master of Laws (LL.M.) or the degree of Doctor of the Science of Law (J.S.D.).

Admission to the graduate curriculum, as a candidate for either the LL.M. or the J.S.D. degree, may be granted to any applicant who has had at least six years of resident study at approved colleges and law schools, who holds a professional degree from a law school approved by the American Bar Association, and who, in the opinion of the faculty, gives evidence of capacity to complete the requirements for the degree; except that an applicant who has not received the A.B., B.S., or equivalent degree may be admitted only if the faculty concludes that his preparation in social sciences other than law has not been unreasonably limited.

Admission to the graduate curriculum, though not as a candidate for a degree, may also be granted to any applicant who holds a professional degree from a law school approved by the American Bar Association and who, in the opinion of the faculty, gives evidence of capacity to continue advanced legal study successfully. An applicant so admitted may, after completion of one academic year of resident study, depending on his achievement and proved ability, be admitted as a candidate for the LL.M. or J.S.D. degree.

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

### **SCHOOL OF LIBRARIANSHIP**

The School of Librarianship offers a two-year curriculum. To students completing the first year with an average grade of at least C+ (1.5 grade-point average) during each semester, the Bachelor of Library Science degree is awarded. The degree of Master of Library Science is granted to students completing the second-year curriculum with an average grade of at least B.

The A.B. degree of the University of California or its equivalent, a grade-point average of at least 1.5 (C+) in the last two years of academic work,

graduate standing, without deficiencies, in the University, and a college year in each of two modern languages—preferably French and German—are required for admission. Ability to use the typewriter with accuracy and a fair degree of speed is expected of all students. Applicants are required to take the Aptitude Test of the Graduate Record Examination and to have their scores sent to the School in time for evaluation before final action is taken on their applications. Applications for admission to the first-year curriculum will ordinarily not be considered from persons over 35; exceptions may be made for those holding advanced degrees or for those who have had successful library experience. Applicants must submit to the Dean of the School complete transcripts of their academic records so that their qualifications for admission to the School may be determined. New first-year students will not be admitted at the beginning of the spring semester.

*Curriculum for the bachelor's degree.*—The School's basic curriculum is designed to prepare municipal, county, college, university, school, children's and special librarians. To ensure adequate opportunity for students who enroll in the School, only a limited number will be accepted for the first-year curriculum. No one should come to Berkeley without having made application to the School and having received notice of acceptance. Early application is desirable and after the class has been selected, opportunity to enter is dependent on withdrawal of someone previously accepted.

The curriculum in librarianship is planned to occupy a student's entire time and only the superior student who has had considerable library experience should expect to do any outside work. It is highly desirable that students come to Berkeley with sufficient funds to meet all first-semester expenses and that they refrain from outside work until their first-semester grades demonstrate that such additional work can be carried without detriment to their studies.

*Curriculum for the master's degree.*—Candidates for the master's degree must be accepted in graduate standing, without deficiencies, in the University of California, must have completed with a scholarship grade of at least B the first-year curriculum in a graduate (Type I or II) library school, accredited by the American Library Association and approved by the University of California, must have had not less than eight units of each of two modern foreign languages and are required to take the Aptitude test of the Graduate Record Examination.

Any course in the second-year curriculum is open to any graduate student who satisfies the instructor of his ability and preparation to undertake the work, even though he is not a candidate for a master's degree in this School and does not qualify for it.

Candidates for the master's degree are subject to all general University regulations governing that degree (see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION).

### SCHOOL OF MEDICINE (San Francisco)

*Matriculation.*—For matriculation in the School of Medicine—the four-year curriculum leading to the degree of Doctor of Medicine—the student must have attained senior standing in the premedical curriculum in the College of Letters and Science (see page 71). Students who so desire may complete work for the bachelor's degree before applying for admission to the School of Medicine.

Applicants for admission to the School of Medicine are required to take the Medical College Admission Test, administered for the Association of American Medical Colleges by the Educational Testing Service of Princeton, New Jersey. The test is given at various colleges and universities, including the University of California.

Applications for admission to the School of Medicine should be filed with the Office of the Director of Admissions, The University of California Medical Center, San Francisco 22, California. Applications for the September, 1955, first-year class must be filed between October 1, 1954, and November 30, 1954, but no application blanks will be issued by the Office of the Director of Admissions after November 15, 1954. It will not be possible to give a statement of tentative acceptance to any applicant.

Enrollment in the School of Medicine is limited. Candidates for admission to the first-year class are accepted primarily on the basis of scholarship, particular emphasis being placed on the required subjects. Two personal interviews are held. Each applicant must take the Medical College Admission Test. Applicants for the September, 1955, class must take the Medical College Admission Test in 1954 unless it has been taken before that time. Many medical schools will ask that the test be taken in May, 1954. The University of California School of Medicine prefers that students arrange to take the examination at the later date, that is, in November, 1954, although either time is acceptable. Normally, students must apply to take the Medical College Admission Test at least three weeks, but not more than three months, prior to the scheduled date. The test should be repeated if at the time of application, more than two years have elapsed since the last test. Further information may be obtained from the Educational Testing Service, Princeton, New Jersey.

The student must complete all premedical requirements, including American History and American Institutions, not later than the spring semester preceding his admission. Since Zoölogy 4 is a required course for the School of Medicine, and as this particular course is given in very few places other than at the University of California, it may be taken during either of the last two summer sessions at the University of California immediately preceding admission to the School of Medicine. All other courses must be completed by the end of the spring semester preceding admission.

While eight units of credit in a modern foreign language will be accepted by the School of Medicine as a "reading knowledge," it is a requirement of the College of Letters and Science that 16 units in not more than two languages be completed before entrance into the junior year in order that the student be eligible to receive the Associate in Arts degree. Those students who have a bachelor's degree (or who will have prior to entrance to the School of Medicine) need meet only the School of Medicine requirement of 8 units in a modern foreign language.

The procedure for making interview appointments is as follows:

1. The application and all transcripts of record are filed with the Office of the Director of Admissions.
2. Upon completion of evaluation of the records by the Office of the Director of Admissions, the Dean's Office is notified.
3. Qualified applicants are then requested by the Dean's Office to make appointments for two interviews.

Certain applicants may be rejected, without interview, because of low premedical scholarship, and/or a low score in the Medical College Admissions Test, and, occasionally, for other reasons. Attention is called to the fact that no personal interview appointments are given until the applicant's record has been evaluated.

*California Applicants.*—The majority of places in each class are given to students from California. Applications are screened carefully by the Committee on Admissions. In reaching a decision, the Committee takes into consideration the applicant's legal residence, the location of his high school and of the institution in which he has taken premedical work, the legal residence of his parents, and occasionally, other factors.



Selection of the class will be limited to California applicants with the exception of the five out-of-State applicants mentioned below.

*Out-of-State Applicants.*—The School of Medicine has certain limitations on students from outside the State of California. Not more than five students will be accepted in this group. These may be in two categories, as follows:

1. Not more than *four* will be selected from the following Western states not having medical schools: Nevada, Arizona, Idaho, Montana, Wyoming, and New Mexico, or from the territories of Alaska and Hawaii. To be considered in the category, *the applicant must be a legal resident of the state or territory concerned.*

2. Not more than one applicant will be accepted from outside of the continental United States, Alaska, and Hawaii. This applicant must have completed at least one year of premedical or academic work at the University of California, or at an equivalent institution in the United States, one semester of which must have been completed prior to February 15 of the year of admission. For this place, the Committee on Admissions will select an individual from a foreign country who is in the United States for the purpose of pursuing his medical education and who intends to return to his own country following graduation, preferably for teaching in a school of medicine, for public health work or for related fields. The attention of applicants for this place is called to the fact that completion of the premedical program at the University, or at another institution, does not necessarily guarantee acceptance by the School of Medicine.

An accepted applicant who finds it impossible to begin his work in the School of Medicine in September, 1955, or a student who actually enters at that time and begins his work, but finds it necessary to withdraw in his first year, loses his place and is required, in the event he desires to begin his work later, to reapply with a subsequent group of applicants. Applicants for admission to the School of Medicine are required to pass a satisfactory medical examination for physical and mental fitness prior to the time of first registration in the School. Students in attendance in San Francisco are examined annually.

All of the above is subject to change by such emergencies as may arise.

For further information see the annual ANNOUNCEMENT OF THE SCHOOL OF MEDICINE, and the leaflet for the 1955 class, both of which may be obtained from the Dean's Office, School of Medicine, University of California Medical Center, San Francisco 22, California.

### Training Courses

Under the auspices of the School of Medicine, various training courses are offered at the Medical Center, San Francisco.

#### EXFOLIATIVE CYTOLOGY

The University of California School of Medicine offers a training course for medical laboratory technicians in the technical methods of exfoliative cytology.

*Admission.*—A degree of Bachelor of Arts or Bachelor of Science in medical sciences and a certificate in medical laboratory technique or the equivalent of these qualifications.

*Curriculum.*—Students complete a course in Exfoliative Cytology, designed primarily for the training of medical laboratory technicians in the technical methods of exfoliative cytology including collection, preparation, staining and screening of specimens for detection of abnormal or malignant cells.

*Certificate.*—A certificate of completion for the curriculum will be given upon satisfactory completion of the course.

*Fees.*—Fees are as follows:

	<i>First or Second Semester</i>
Incidental Fee .....	\$42.00

For further information, write to the Director, Cancer Research Institute, University of California Medical Center, San Francisco 22, California.

### MEDICAL TECHNOLOGY

The University of California School of Medicine offers a training program to students preparing to be medical technicians.

*Admission.*—Applicants must satisfy one of the following requirements:

1. Bachelor's Degree:

Applicants for admission on this basis must hold a bachelor's degree with a major in one of the biological sciences. Courses taken in preparation for the major must have included Bacteriology 101 and Biochemistry 102 or 100A-100B, and 101A-101B, or their equivalent.

2. Three years of college training:

Applicants for admission on this basis must have completed three years of a regulation curriculum in medical or clinical laboratory technic. This curriculum must have included courses in biochemistry and advanced bacteriology. Applicants will not be considered unless the college they attended shall grant a bachelor's degree to them upon satisfactory completion of the four-year curriculum.

*Curriculum.*—The course is given as a practical apprenticeship. It consists of one year (48 weeks) of full-time work, and covers training in biochemistry, medical bacteriology, parasitology, mycology, histological technic, clinical pathology, serology, blood bank procedures, basal metabolism, and electrocardiography. Upon satisfactory completion of the course, the student is eligible for the State Examination and the National Registry Examination.

*Certificate.*—A certificate is given upon satisfactory completion of the course.

*Fees.*—Fee is as follows:

	FIRST SEMESTER		SECOND AND THIRD SEMESTERS	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee.....	\$42.00	\$42.00	Same as first semester	

For further information, write to the Supervisor, Curriculum in Medical Technology, University of California Medical Center, San Francisco 22, California.

### ORTHOPTICS

A course of eight months for orthoptic technicians is given at the University of California School of Medicine.

*Admission.*—Minimum prerequisite is a bachelor's degree or its equivalent. Candidates with previous teaching experience are preferred, but this experience is not essential. A personal interview with the Supervisor of the course will precede acceptance.

*Curriculum.*—Student technicians will attend lectures and act as assistants in the Florence C. Noble Orthoptic Clinic from 8:30 a.m. to 4:30 p.m. daily throughout the academic year. The training is devised so that the students will have the necessary knowledge and experience to qualify for the examinations given by the American Orthoptic Council.

*Certificate.*—A certificate is given upon completion of the course.

*Fees.*—Fees are as follows:

	FIRST SEMESTER		SECOND SEMESTER	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee . . . . .	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00
Tuition Fee . . . . .	200.00*	200.00*	.....*	.....*
	<u>\$242.00</u>	<u>\$242.00</u>	<u>\$ 42.00</u>	<u>\$ 42.00</u>

For further information, write to the Supervisor, Orthoptic Technicians Course, The University of California Medical Center, San Francisco 22, California.

#### PHYSICAL THERAPY

The requirements for admission to the curriculum in physical therapy offered by the University of California School of Medicine meet and exceed those set by the Council on Medical Education and Hospitals of the American Medical Association.

*Admission.*—Applicants for admission must satisfy one of the following requirements:

1. Bachelor's degree from an accredited institution.

Candidates for admission on this basis must have completed 26 semester units of biological and physical science. Upon satisfactory completion of the course, the student is awarded a certificate.

2. Three years of college or university training.

Candidates for admission on this basis must have completed courses that qualify them for senior standing in the College of Letters and Science of the University of California, and the requirements in the basic sciences of the Curriculum in Physical Therapy. The student may matriculate into the Curriculum in Physical Therapy in his fourth year of college and obtain the degree of Bachelor of Science and a Certificate of Completion in Physical Therapy.

Applicants for admission must present transcripts from their colleges, or universities. Such records must show the satisfactory completion of the following courses, or their equivalent:

Chemistry 1A—

5 units or 5 semester hours—(general inorganic chemistry)

Physics 10—

3 units or 3 semester hours—(general physics)

Anatomy 102—

3 units or 3 semester hours—(general human anatomy)

Physiology 1 and 1L—

5 units or 5 semester hours—(introductory physiology)

Psychology 168—

3 units or 3 semester hours—(abnormal psychology)

*Curriculum.*—Two semesters will include all theory, seminars, and demonstration. The final sixteen weeks will be devoted to practical training and can be completed in approved hospitals. The curriculum includes anatomy, physiology, physics, pathology, psychology, surgery, orthopaedic surgery, medicine, neurology, pediatrics, nursing, ethics and administration, electrotherapy, radiation, hydrotherapy, massage, kinesiology, therapeutic exercise, and clinical practice.

\* The \$200 tuition fee covers the course of eight months and is payable only once.

*Fees.*—Fees for the first and second semesters are as follows (there being no fees for the third semester):

	FIRST SEMESTER		SECOND SEMESTER	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee.....	\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00
Tuition Fee .....	75.00	150.00	75.00	150.00
	<hr/>	<hr/>	<hr/>	<hr/>
	\$117.00	\$192.00	\$117.00	\$192.00

For further information, write to the Technical Supervisor, Curriculum in Physical Therapy, The University of California Medical Center, San Francisco 22.

#### X-RAY TECHNICIANS

A training program for X-ray technicians is offered at the University of California School of Medicine, San Francisco. This course extends through a full calendar year beginning with the fall semester.

*Admission.*—An anatomy course and physics courses are required for admission. Physics 2A–2B and 3A–3B are preferred, but Physics 10 is acceptable. Anatomy 102 is required. If the prerequisite courses are taken at the University of California, Berkeley, two years are usually required for completion. Equivalent anatomy and physics courses may be taken at other institutions.

*Curriculum.*—Practical training for X-ray technicians is offered in the Department of Radiology. The curriculum rotates the student through all areas of the X-ray department and is designed to give the student knowledge of the various procedures used in making X-ray examinations, the techniques used in developing films in the dark room, the services required of a technician in the fluoroscopy room, and in assisting the radiologist in therapy. The student is taught the routine procedures handling patients in the reception areas, the filing of films and other matters concerned with the running of an X-ray department. Practical instruction is supplemented by lectures in anatomy, physics and other subjects related to radiology.

*Certificate.*—A certificate of completion of the curriculum will be given to the student upon satisfactory completion of the course. The student, upon completion of the course and with one year of experience as an X-ray technician, serving under the direction of a qualified radiologist, is eligible for the American Registry examination.

*Fee.*—Fee is as follows:

	FIRST SEMESTER		SECOND SEMESTER	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee.....	\$42.00	\$42.00	Same as first semester	

The student must supply his own maintenance and uniforms.

For further information concerning the program, write to the Medical Director, X-ray Technicians Course, The University of California Medical Center, San Francisco 22, California.

#### SCHOOL OF NURSING

The School of Nursing offers three curricula leading to the degree of Bachelor of Science and certificates of completion in nursing, public health nursing, and nursing education. A graduate curriculum leading to the degree of Master of Science is also offered.

**UNDERGRADUATE CURRICULUM**

The undergraduate curriculum is designed to prepare young women for participation in community health programs. This leads to the degree of Bachelor of Science and the Certificate of Completion in Nursing. Graduates of this program are eligible to apply for the California Public Health Nursing Certificate without examination.

The nurse of today is expected to be able to assist with the care of the sick, the prevention of disease, and the maintenance of health. Through class work, conferences, and supervised practice the student is given an opportunity to learn the care of patients in the hospital and in the home, the measures which are used to teach health and prevent disease, and the community resources for the handling of the health problems of its citizens.

**Requirements for Admission**

The completion of the requirements for the degree of Associate in Arts as prescribed by the College of Letters and Science or the College of Applied Arts is required for admission to the School of Nursing. The work taken to satisfy this requirement must include the specified courses listed on page 141 of this bulletin.

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

Students completing the curriculum in the School of Nursing must take the State Board Examination in order to secure their licenses to practice in this State. An applicant for this examination must either be a citizen of the United States or have declared his intention to become a citizen of the United States. Students in the College of Letters and Science, preparing for admission to the School of Nursing must include the following courses in their programs of study leading to the degree of Associate in Arts.

Chemistry 1A .....	5
Bacteriology 2 .....	4
Physiology 1 and 1L .....	5
Anatomy 102 .....	3
Psychology 1A .....	3
English 1A-1B or Speech 1A-1B..	6

American History and American Institutions examinations or courses should be completed. See page 37.

Students who transfer to the School of Nursing in San Francisco from junior colleges, and other colleges and universities may qualify for admission by meeting the above requirements as offered by the College of Applied Arts of the University of California, Los Angeles.

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

**CURRICULA FOR GRADUATE NURSES****Bachelor of Science Degree**

These curricula lead to the Bachelor of Science degree and to the Certificate of Completion in either public health nursing or nursing education. The purpose is to prepare nurses for staff positions in public health nursing agencies or clinical teaching and departmental supervision in schools of nursing.

### Requirements for Admission

Graduates of approved nursing schools who have met the matriculation requirements of the University may be admitted to the professional program upon completion of a minimum of 60 units of work, with at least a C average, in courses selected in accordance with Plan I or Plan II, including such special requirements as may be prescribed by the Faculty of the School of Nursing.

*Plan I.*—Completion at Berkeley, or elsewhere, of the program of study required for junior standing by the College of Letters and Science of the University of California, or the substantial equivalent.

*Plan II.*—Completion at Berkeley, or elsewhere, of the program of study required for junior standing by the College of Applied Arts, University of California, Los Angeles, or the substantial equivalent.

### Specialization in Advanced Psychiatric Nursing

In coöperation with the United States Public Health Service and the Langley Porter Clinic, a major in nursing education with specialization in advanced psychiatric nursing has been established under the provisions of the National Mental Health Act. The requirements for admission to the professional program are as stated above. In addition, Psychology 33, 3 units, and Sociology and Social Institutions 1 and 2, 6 units, are desirable. Psychiatric experience is advantageous.

### Additional Requirements for Graduation

1. Completion of at least 60 units of such additional work as may be prescribed by the Faculty of the School of Nursing. Not more than 30 units of work completed in a school of nursing other than that of the University of California will be accepted in partial satisfaction of this requirement.
2. Completion of the final years of study in the academic departments of the University of California, Berkeley. Two semesters or one semester and two summer sessions satisfy this requirement.

### Lower Division Programs in the School of Nursing

#### *Plan I.*—COLLEGE OF LETTERS AND SCIENCE\*

- |  |  |
|--|--|
| (a) Subject A.   | (2) Foreign language (additional to <i>b</i> ).    |
| (b) Foreign Languages. 16 units.                             | (3) Mathematics.                                   |
| (c) Mathematics.   | ‡(4) Social sciences (must include Psychology 1A). |
| (d) Natural Science. 12 units including a laboratory course. | (5) Philosophy.                                    |
| (e) Three Year Courses.                                      | (6) Fine arts and literature.                      |
| ‡(1) English 1A-1B or Speech 1A-1B.                          |  |

#### *Plan II.*—COLLEGE OF APPLIED ARTS†

- |  |   |
|--|---|
| (a) Subject A.   | (e) Mathematics. Elementary algebra and plane geometry. |
| (b) Natural Science. 12 units, all in college courses and including a laboratory course. | (d) Three Year Courses.                                 |
|  | ‡(1) English 1A-1B or Speech 1A-1B.                     |

\* For a more detailed statement of course requirements, see the lower division requirements of the College of Letters and Science, page 61.

† For a more detailed statement of course requirements in the College of Applied Arts, see the ANNOUNCEMENT OF COURSES AND CURRICULA, DEPARTMENTS AT LOS ANGELES.

‡ Under either plan English 1A-1B or Speech 1A-1B and Psychology 1A are required for entrance into the School of Nursing.

**Lower Division Programs in the School of Nursing—Continued**

- |  |   |
|--|---|
| (2) Foreign language. Two college semesters of the same language.<br>(3) Mathematics.<br>(4) Social sciences.<br>Sociology and Social Institutions 1, 2.<br>History 4A-4B, 8A-8B, 17A-17B. | †(5) Psychology 1A, 1B or 33.<br>(6) Philosophy 6A-6B, 12A-12B, 20A-20B.<br>(7) Art 1A, 1B, 1C, 1D (any two), 2A-2B.<br>Music 1A, 1B, 3A, 3B, 21A-21B, 27A-27B. |
|--|---|

**Upper Division Program in the School of Nursing***Third Year*

Requirements for this year can be met wholly or in part through courses taken in another school of nursing. Students receiving less than 30 units of credit for such courses will complete requirements for the third year by electing courses which will supplement their basic nursing preparation.

*Fourth Year***General Requirements**

Education (including Education 110) .....	5 units
Socioeconomics (including Social Welfare 100) .....	5 units
American History and American Institutions.....	courses or examinations

**Major in Nursing Education****Major in Public Health Nursing**

	Units		Units
General Requirements .....	10	General Requirements .....	10
Nursing 432 .....	2	Public Health 145 .....	3
Nursing 434 .....	3	Public Health 100A .....	3
Electives .....	15	¶ Education 151 .....	2
	—	Nursing 416 .....	3
	30	Nursing 418-419 .....	6
In lieu of electives students specializing in advanced psychiatric nursing include:		Electives .....	3
Psychology (including 111, 136, 168) .....	8		—
Anthropology 118A .....	3		30
Sociology 130 .....	3		

The degree of Bachelor of Science will be conferred upon completion of any one of the programs set forth above. An additional semester of field work (Nursing 420 or Nursing 433) must precede the granting of the Certificate in Public Health Nursing or the Certificate in Nursing Education.

For more detailed information regarding this program, students should refer to the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

‡ Under either plan English 1A-1B or Speech 1A-1B and Psychology 1A are required for entrance into the School of Nursing.

|| For list of courses accepted in fulfillment of the requirement of American History and American Institutions, or for other means of satisfying the requirement, see page 87.

¶ May be counted as satisfying 2 units of the general requirement in Education.

### **Master of Science Degree**

A program of study is offered which leads to the Master of Science degree in the fields of nursing education and public health nursing. The aim of this program is to prepare nurses for administrative, supervisory, and teaching position in schools of nursing and public health agencies.

### **Requirements for Admission**

The student must have been admitted to the Graduate Division, Northern Section. This includes the completion during the last two years of her college course of 36 units of advanced (upper division) academic work based on proper prerequisites, including at least 15 units of advanced fundamental work basic to the proposed major subjects for a higher degree. In addition, she must be certified by the School of Nursing to be eligible to complete the program for a higher degree. She should have had at least two years of successful experience in clinical nursing practice, clinical instruction, or experience in a community health agency.

The candidate will follow Plan 1 or 2 as outlined by the Graduate Division, Northern Section. Twelve units of work will be selected from courses numbered in the 200 series in nursing and twelve from upper division and graduate courses in fields related to the student's major program. For further information, see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

### **FEES AND EXPENSES**

While the student is in residence at Berkeley, she will be required to meet all the expenses outlined in earlier pages of this bulletin.

For expenses of students at the University of California Medical Center in San Francisco, see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

### **SCHOOL OF OPTOMETRY**

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

Admission to the School of Optometry is limited to fifty students for each entering class. Candidates for admission to the first-year (junior) class are accepted primarily on the basis of scholarship with particular emphasis placed on the required subjects. In addition, special consideration is given to California applicants and to applicants from states west of the Mississippi.

Applications for admission for the fall semester of any year should be filed with the Director of Admissions by May 1 of that year in order to receive consideration. For students who are not already resident at the University of California, the application for admission must be accompanied by a small passport-type photograph and a certificate from a physician which states in detail the physical condition of the applicant based upon a thorough medical examination; any physical or mental handicap of the applicant should be indicated. The Committee on Admissions of the School of Optometry reserves the right to refuse admission to an applicant on the basis of obvious disability which in the opinion of the Committee would interfere with successful completion of the curriculum.

For admission to the School of Optometry the applicant is required to show completion of the requirements for the degree of Associate in Arts as prescribed by the College of Letters and Science, or the equivalent. The courses taken for the degree of Associate in Arts should include the following specific



subjects required by the School of Optometry: anatomy\*, bacteriology, chemistry, physics, plane analytic geometry, psychology, speech or English, and zoölogy\*.

An accepted applicant who finds it impossible to begin his work in the School of Optometry in September, 1954, or a student who finds it necessary to withdraw during his first (junior) year, loses his place and must apply for admission with a subsequent group of applicants should he desire to continue his work in optometry.

PREOPTOMETRY CURRICULUM

<i>Freshman Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Sophomore Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Subject A (see page 36) .....	-	-	Military Science ..	2 or 0	2 or 0
Military Science ...	2 or 0	2 or 0	*Anatomy 102 .....	-	3
Chemistry 1A-8 ...	5	3	Bacteriology 2 ....	-	4
Mathematics 3A ...	-	3	Physics 2A-2B ....	3	3
Speech 1A-1B (or English 1A-1B) .	3	3	Physics 3A-3B ....	1	1
‡Foreign Language. 4	4	4	Psychology 1A-33 (or 1A-1B) ....	3	3
§Elective .....	1 or 3	0 or 2	*Zoölogy 1A .....	4	-
			§Elective .....	2 or 4	0 or 2
	15	15		15	16

The foregoing program if satisfactorily completed will meet the requirements for the degree of Associate in Arts in the College of Letters and Science at the end of the fourth semester, and the prerequisite subjects for the study of optometry, provided the following high school subjects have been offered for matriculation: algebra, chemistry, physics, plane geometry, trigonometry, and three years of a foreign language.

The following required curriculum taken in the School of Optometry leads to the degree of Bachelor of Science at the end of the senior year and the Certificate in Optometry and the degree of Master of Optometry at the end of the graduate year. For further information and detailed degree requirements see the ANNOUNCEMENT OF THE SCHOOL OF OPTOMETRY.

\* While Zoölogy 1A and Anatomy 102 is the preferred biological science sequence in the preoptometry program, this requirement may be satisfied for admission purposes by one of the following alternative sequences:

- Zoölogy 1A-Zoölogy 1B
- Zoölogy 1A-Comparative Anatomy
- Zoölogy 1A-Human Anatomy
- Physiology 1, 1L-Human Anatomy

Unless a course in human anatomy which is the full equivalent of Anatomy 102 at the University of California is offered in one of the above sequences, Anatomy 102 must be included in the junior year program of the School of Optometry.

‡ Students must have had three years of a foreign language in high school.

§ See Associate in Arts degree requirements, College of Letters and Science, as described on page 61.

## REQUIRED CURRICULUM IN OPTOMETRY

<i>Junior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Senior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
American History and American Institutions (see page 37) .....	—	—	Optometry 101 .....	3	—
Optometry 102A-102B ..	3	4	Optometry 103A-103B ..	3	3
Optometry 401A-401B ..	2	2	Optometry 404A-404B ..	3	3
Physics 108A-108B (2) ..	3	3	Optometry 406A-406B ..	2	2
Physiology 110A-110B ..	3	3	Optometry 407A-407B ..	1	2
Physiology 115 .....	4	—	Physiological Optics 105A-105B .....	3	3
*Elective .....	1	3	Physiological Optics 106A-106B .....	1	1
			*Electives .....	—	3
	16	15		16	17

<i>Graduate Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Optometry 409A-409B ..	6	6
Optometry 412A-412B ..	3	3
Optometry 414A-414B ..	2	2
Optometry 416A-416B ..	2	2
Optometry 417 .....	—	1
Physiological Optics 203.	2	—
Physiological Optics 205.	—	1
	15	15

## SCHOOL OF PUBLIC HEALTH

Students who are considering a major in public health should report to the Dean's office, School of Public Health, as early in their academic career as possible. Formal application for admission to the School of Public Health should be made not later than the last semester of the sophomore year. Those applying for admission to the School any later may encounter difficulty in arranging proper sequences for prerequisite and required courses in the School of Public Health.

*Admission.*—To be admitted to the School of Public Health, students must have completed at least 60 units in one of the colleges of the University or an equivalent thereof satisfactory to the Faculty of the School of Public Health. In order to complete the work in the minimum number of semesters, students should also have completed the prerequisite courses listed below.

SUGGESTED LOWER DIVISION PROGRAM PREPARATORY TO  
ADMISSION TO THE SCHOOL OF PUBLIC HEALTH(1) *General Requirements:*

Subject A. (See page 36.)

Military Science. (See page 39.)

American History and American Institutions. (See page 37.)

(2) *Basic subjects required for all public health majors:*

Public Health 5A-5B.

Bacteriology 2.

\* Students must meet the requirements of the School of Optometry.

Chemistry 1A.  
Physiology 1-1L<sup>1</sup> or Zoölogy 1A or 10.<sup>2</sup>

Psychology 1A.  
At least 6 units from:

English 1A, 1B.  
Speech 1A, 1B.

At least 6 units from:  
Anthropology 2A, 2B.

Economics 1A, 1B.  
Geography 1, 2.

Mathematics 3A, 3B.  
Sociology and Social Institutions 1, 2.

(3) *Additional requirements for specific majors as indicated:*

*Biostatistics*

Mathematics 3A-3B.

*Laboratory (Public Health and Clinical)*

Chemistry 1B, 5, 8.  
General physics (if physics not taken in high school).  
Zoölogy 1A.

*Preadministration*

Business Administration 1A-1B.  
Economics 1A-1B.  
Political Science 1.

*Public Health Education*

Public Health 35.  
Decorative Art 6A.  
Physical education activities (2 units).  
Psychology 33.

*Sanitary Science*

Chemistry 1B, 8.  
Mathematics C (if not completed in high school).  
Physics 2A-2B, 3A-3B.  
Recommended electives: Chemistry 5, 9, Engineering 8, 21, and 22.

**PROGRAM IN THE SCHOOL OF PUBLIC HEALTH—UNDERGRADUATE CURRICULA**

Candidates for the degree of Bachelor of Science must have completed at least 120 units of college work, including the specific requirements of one of the majors. A minimum of 24 units must be completed after admission into the School of Public Health. The student must have obtained at least as many grade points as there are units in the total credit value of all courses undertaken by him in the University of California. He must have satisfied the requirement of American History and American Institutions. (See page 37.)

**The Majors**

(1) *Biostatistics*

Public Health 100A, 111, Anatomy 102 (or Public Health 135), 160A, 160B, 161A, 161B, and at least one other statistics course.

At least 14 units from:

Other upper division public health courses.

<sup>1</sup> Physiology 1-1L is not acceptable for Laboratory majors.

<sup>2</sup> Zoölogy 10 is not acceptable for Health Education, Laboratory, or Sanitary Science majors.

At least 10 units from any courses in:

- Economics.
- Mathematics.
- Psychology.
- Sociology.
- Zoölogy.
- Electives.

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

- Public Health 100A, 111, 147A, 147B, 150A, 150B, 162.
- Bacteriology 101.
- Biochemistry 102.
- Entomology 117.
- Zoölogy 140.
- Electives.

For those emphasizing clinical laboratory, Physics 2A-2B, 3A-3B, and Zoölogy 119A-119B are recommended. For those emphasizing public health laboratory, recommended electives are other public health courses, Entomology 126, Food Technology 113.

(3) *Preadministration*

Required for all preadministration majors:

- Public Health 100A, 100B, 106, 110, 134, 162, 187.
- Anthropology, 3 units.
- Economics 130A, 185.
- Psychology 145.

Plus one of these three groups:

A. Required for those interested in public health administration:

- Public Health 147A, 170.
- Business Administration 151.
- One of the following:
  - Political Science 102A, 103A, 175.
  - Electives.

B. Required for those interested in medical care administration:

- Public Health 145, 170.
- Business Administration 140, 151.
- Political Science 153, 175.
- Electives.

C. Required for those interested in hospital management:

- Public Health 145.
- Business Administration 122, 140, 150, 151.
- Political Science 153.
- Psychology 187.
- Electives.

(4) *Public Health Education*

- Public Health 111, 110, 125, 131, 133, 134, 135, 136, 145, 162.
- Anthropology 118A, 118B or Sociology (two upper division courses).
- Education 106, 170, 181.
- Home Economics 111, 137.
- Psychology 145, and one additional upper division psychology course.
- Electives.

(5) *Sanitary Science.*

- Public Health 100A, 112, 113, 114, 117, 118, 119, 134, 147A, 147B, 162, 170.
- Bacteriology 101.
- Civil Engineering 123, 124.

Entomology 126.

Food Technology 112.

Not less than 4 units from either (A) or (B) :

A. For students interested in the biological and social science aspects :

Public Health 171, 186.

City Planning 110.

Political Science 185.

B. For students interested in the physical science aspects :

Civil Engineering 108A.

Engineering 23, 35.

Engineering Design 102B.

Mathematics 4A, 4B.

Mechanical Engineering 103, 105A, 105B.

Electives.

Premedical students who have met all requirements for the first three years in the College of Letters and Science may be admitted to the School of Public Health as candidates for the B.S. degree (Sanitary Science) upon the completion of Bacteriology 2. It is recommended that Public Health 100A and 111 be completed by the end of the third year. Students majoring in sanitary science who plan to obtain a degree of Master of Science in sanitary engineering are advised that elective units should be chosen from engineering subjects after consultation with the Dean of the College of Engineering.

### Honors

Students whose work has been of marked excellence may receive Honors or Highest Honors at graduation.

### Graduate Curricula

#### DEGREE OF MASTER OF PUBLIC HEALTH

*Admission.*—To be admitted to the curriculum leading to the degree of Master of Public Health, the student must have graduated from an approved medical school, college of dentistry, or college of engineering, or have received an acceptable bachelor's degree with adequate training in mathematics and the natural sciences including chemistry and biology, and in the social sciences; he must be qualified in some professional capacity for postgraduate education in public health; and must have, in addition, either

- (1) Professional academic qualification in engineering, nursing, education, or postgraduate work in other fields of public health; or
- (2) Three years of experience in responsible public health practice.

An applicant for the M.P.H. degree who does not have a doctoral degree must have completed the requirements of the major in his respective fields of emphasis at the University of California or the equivalent elsewhere. For fields of emphasis and requirements therein, see the ANNOUNCEMENT OF THE SCHOOL OF PUBLIC HEALTH. A student who has undergraduate deficiencies must remove them before he may complete the requirements of his curriculum.

*General requirements for the degree:*

- (1) At least one academic year of graduate residence at the University of California and a program including not less than 24 units of acceptable course work in the major subject, of which at least 12 units must be graduate courses. An average of not less than two grade points per unit must be maintained in all work completed in graduate standing. By special permission, a candidate may be authorized to present an acceptable thesis in lieu of 4 of the 24 units required.

- (2) A comprehensive final examination either in the student's field of specialization or in the general field of public health, as determined by the faculty committee.
- (3) At least twelve weeks of approved field service in a public health agency. This may be waived for those presenting evidence of previous qualifying experience.\*

#### DEGREE OF DOCTOR OF PUBLIC HEALTH

*Admission.*—To be admitted to the curriculum leading to the degree of Doctor of Public Health the student must ordinarily hold the M.D. degree. In exceptional cases, however, a candidate may be admitted who holds from an approved university a doctoral degree other than that of M.D. The candidate must have completed with a B average, or better, basic courses equivalent to those required for the degree of Master of Public Health at the University of California.

#### *General requirements for the degree:*

- (1) In addition to requirements indicated above, the candidate must have completed in residence at the University of California at least one academic year of work involving advanced specialization in the particular field of public health for which he is preparing.
- (2) The candidate must have indicated his capacity to make a substantial contribution to the advancement of the science and art of public health by submitting a dissertation on a subject chosen by himself and bearing on his principal subject of study, and of such character as to show power to prosecute independent investigation. The dissertation must have received the approval of a special committee in charge of the dissertation, appointed by the Dean of the School of Public Health with the approval of the Graduate Council, and must have been defended by the candidate before a committee appointed in the same manner and including the members of the special committee in charge of the dissertation. Special emphasis will be laid upon the requirement of a dissertation, and the degree will in no case be given merely for the faithful completion of a course of study, however extensive.
- (3) The candidate must have demonstrated ability for practical leadership in his field, either
  - (a) By prior successful professional experience in a post involving the exercise of substantial initiative and responsibility, or
  - (b) By such other means as the Faculty of the School of Public Health may prescribe.

#### SCHOOL OF SOCIAL WELFARE

The School of Social Welfare offers a graduate curriculum leading to the professional degree of Master of Social Welfare (M.S.W.). The graduate program consists of two academic years (four semesters). The work of the first year is designed to give all students a knowledge of the social services and related problems, and an opportunity to develop skill in professional practice. In the second year of study, students extend and develop the knowledge and skills acquired in the first year and concentrate on areas of special interest such as family and child welfare, corrections, medical social work, psychiatric social work, social welfare administration, social group work, or social welfare research. These areas are selected in accordance with the student's interests and aptitudes.

\* Upon completion of the academic requirements, students of hospital administration spend an additional year in an administrative residency in an institution approved by the school.

Students who are unable to continue immediately to the second year are qualified for some professional positions in social work. They are eligible for junior membership in the American Association of Social Workers, and are eligible to take the official State of California examination for Registered Social Workers.

*Requirements for admission.*—Admission to the School of Social Welfare is limited to students who:

- (A) Hold the degree of Bachelor of Arts or Bachelor of Science from the University of California or an equivalent degree from a college or university of recognized standing, and who have established their eligibility for admission in graduate standing at the University of California.
- (B) Are not over 35 years of age; however, for persons who, through experience in the field, have demonstrated good capacity for social work, this requirement may be waived.
- (C) Are in good health, as indicated by a thorough medical and physical examination conducted by the University of California Student Health Service at time of registration.
- (D) Comply with either of the following requirements:
  1. Completion of the group major in social welfare offered at the University of California, Berkeley, or of an equivalent major.
  2. Completion of the University of California courses listed below, or their equivalents, or presentation of satisfactory evidence (ordinarily by writing noncredit qualifying examinations) that they have adequate knowledge of the subject matter of such courses:
    - a. Economics 1A-1B (Elements of Economics).
    - b. Psychology 1A (General Psychology).
    - c. Economics 2 (Elementary Statistics), or Psychology 5 (Introduction to Psychological Measurements), or some other course in elementary statistical methods such as Sociology 16, Education 114, Public Health 160A, 162 or Mathematics 12.
    - d. Economics 150 or 152 (Labor Economics) or some other course in social economics, such as Economics 180 (The Problems of Poverty), or Economics 185 (Social Insurance), or courses in sociology.
    - e. Psychology 160 (Mental Deficiency) or some other course in clinical or abnormal psychology.

In the case of applicants who have completed one or more years of study at another graduate school of social work, this requirement may be modified at the discretion of the School. Attention is directed to the fact that preparation in elementary statistics is prerequisite to the research course given in the first-year program in the School.

- (E) Satisfy the Admissions Committee of the School that they are also suitable in other respects for the profession of social work.

*Undergraduate preparation.*—The group major in social welfare, described on page 75, is strongly recommended for students preparing for admission to the School of Social Welfare. Alternatively, they may take undergraduate majors in economics, psychology, political science, or sociology, or a group major in social science, these majors to include the prerequisite courses listed above. Students looking toward social work education should consult the School of Social Welfare as early as possible in their college careers for advice.

*Requirements for the master's degree.*—The degree of Master of Social Welfare (M.S.W.) will be granted to students who:

- A. Have been admitted to the School of Social Welfare in accordance with the regulations of the Academic Senate.
- B. Have spent two years of graduate study in social welfare, including at least one year in residence at the University of California (Berkeley).

- C. Have completed a program of study approved by the School, according to one of the following plans:

*Plan 1. (a)* There are required at least 40 units in upper division, graduate, and professional courses, including a minimum of 20 units of upper division and graduate courses completed with an average grade not lower than grade B; *(b)* the completion of a satisfactory thesis; and *(c)* the passing of a comprehensive final examination in the field of social welfare.

*Plan 2. (a)* There are required at least 44 units in upper division, graduate, and professional courses including a minimum of 24 units of upper division and graduate courses completed with an average grade not lower than grade B; and *(b)* the passing of a comprehensive final examination in the field of social welfare.

- D. Students who have completed courses which are part of the social welfare curriculum in an accredited school of social welfare elsewhere than at the University of California, *may* be granted credit for such courses to the value of not more than 24 units. Not more than 4 such units will be accepted, however, toward satisfaction of the required 20 or 24 units in upper division and graduate courses. Such students must have maintained an average grade not lower than B in *all* those upper division and graduate courses undertaken in graduate residence at the University of California.

*Dates for filing applications.*—Admission to the School of Social Welfare is possible only in the fall of each year. Applications should be submitted as early as possible after the first day of January of the year in which the student wishes to begin his work. Application forms may be obtained at the School of Social Welfare, Building T-1, Berkeley 4, California.

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

### CURRICULUM IN HOSPITAL DIETETICS

The Department of Home Economics of the College of Agriculture, with the approval of the Graduate Council, is authorized to issue a Certificate in Hospital Dietetics to students who complete with an average grade of at least B the curriculum described below, and an internship of 4 months approved by the curriculum adviser.

*Requirements for admission.*—Applicants must hold a bachelor's degree with a major in the field of food and nutrition, including quantitative techniques, from a university or college of recognized standing, must present satisfactory certificates of health, and, in addition, must have the approval of the departmental committee concerned with the training in hospital dietetics.

*Course of study.*—The curriculum extends over a period of at least one calendar year, including one semester of residence at the University of California Hospital in San Francisco, one semester of residence at the University of California in Berkeley and a four-month period of internship assigned by the curriculum adviser. During the residence in San Francisco the student must complete 8 units of instruction and supervised practice in hospital dietetics, and during the residence in Berkeley, 10 to 15 units of work, partly in graduate courses, and ordinarily including courses in human nutrition or diet in disease, laboratory methods in metabolism or advanced biochemistry, marketing or business administration, and hospital dietetics.

All inquiries should be addressed to the Chairman of the Department of Home Economics, University of California, Berkeley 4.



## **INSTITUTE OF INDUSTRIAL RELATIONS**

The Institute of Industrial Relations, authorized by the Legislature of the State of California in 1945, began operations in 1946. It is concerned with three principal types of activity: (1) pursuing an integrated interdisciplinary research program currently directed primarily toward the study of wage structures and wage analysis, the labor market, collective bargaining systems and processes, internal government of private associations, perspectives and perceptions in the industrial community, the aging population, and industrialization and comparative labor movements. Research staff members of the Institute are usually drawn from the regular faculties of the business administration, economics, political science, sociology, and psychology departments; (2) conducting, in coöperation with University Extension, a community relations program serving management, unions, and other groups interested in industrial relations. The program consists of public lectures, conferences, institutes of varying duration, and evening courses; (3) consulting with teaching departments about the development and coördination of a well-rounded, essentially non-vocational curriculum in the field of labor-management relations. The Institute has no curriculum and offers no courses of its own, but it does issue a Curriculum Handbook which outlines the industrial relations courses offered by teaching departments on the Berkeley campus. This Handbook, which also describes the activities of the Institute of Industrial Relations, may be obtained from the Institute of Industrial Relations, Room 201, California Hall, University of California, Berkeley 4.

## **INSTITUTE OF SLAVIC STUDIES**

The Institute of Slavic Studies was established in 1948, with the assistance of the Rockefeller Foundation, for the purpose of encouraging graduate teaching and research on the Slavic nations, both Russian and non-Russian. The Institute is University-wide in scope and functions on the several campuses. Its organization consists of a Director, an Advisory Board, an Academic Staff which includes members of the faculty giving instruction in Slavic studies in the various departments, and additional members appointed on the budget of the Institute. Particular attention is given to the development of scholars in the social sciences and the humanities. Courses in the fields of Slavic studies in the departments of Anthropology, Economics, Geography, History, Political Science, and Slavic Languages and Literatures may be selected for inclusion in the curricula for the master's and doctor's degrees in Slavic studies.

Further information may be obtained from the Director, Mr. Robert J. Kerner, Room 1227, Dwinelle Hall.

## THE GRADUATE DIVISION

For information concerning all matters pertaining to the Graduate Division, including the list of available fellowships and graduate scholarships, also the requirements for higher degrees, see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, to be obtained from the Dean of the Graduate Division.

Advanced instruction is offered by the University of California leading to certificates and to the several degrees of Master of Science, Master of Arts, Master of Bioradiology, Master of Business Administration, Master of City Planning, Master of Criminology, Master of Dental Surgery, Master of Education, Master of Engineering, Master of Forestry, Master of Journalism, Bachelor of Library Science, Master of Library Science, Master of Optometry, Master of Pharmacy, Master of Public Health, Master of Social Welfare, Doctor of Education, Graduate in Architecture, Doctor of Engineering, Bachelor of Laws, Master of Laws, Juris Scientiae Doctor, Doctor of Medicine, Doctor of Public Health, Doctor of Veterinary Medicine, and Doctor of Philosophy.

## INDEX

- A, Subject, 36  
Absence, leave of, 47  
Academic colleges, 14  
Academic Senate, 15  
Accrediting of schools in California, 23  
Administration of the University, 15  
Administrative staff, 8-13  
Admission, by examination, 26, 29, 30  
    in undergraduate status, 33  
    in advanced standing, 28  
    in graduate standing, 33  
    from foreign countries, 31  
    deficiencies, removal of, 26, 28  
    late, 31  
    of returning members of armed forces, 30  
    of special students, 30  
    preparation for, 26  
Advanced standing, 23, 28, 60  
Advisers, in the College of Letters and Science, 60  
    for foreign students, 13, 31  
Aeronautics, 106  
Agricultural, economics, 80, 87  
    education, 81, 87  
    engineering, 99  
Agricultural Sciences Division, 15  
Agriculture  
    College of, at Davis, 5  
    College of, at Los Angeles, 15  
    College of, at Riverside, 15  
    curricula of the College of, 16, 80  
    high school preparation recommended, 79  
    honors, 90  
    minimum scholarship requirements, 43  
    requirements for degree, 80  
Air conditioning, 106  
Air Science, 38  
American civilization, group major in, 66  
American History and American Institutions, 37  
Animal science, 81, 87  
Application fee, 23, 31  
Applied sciences, Colleges of, 16  
Appointment registry for teachers, 55  
Approved lodging houses, 52  
Architecture  
    curriculum of the College of, 18, 90  
    graduate in, 17, 90, 91  
    library, 21  
    Master of Arts in, 90  
    minimum scholarship requirements, 43  
Arts, requirements for degree of Bachelor of, 63  
Associate in Arts degree, 61  
    honorable mention with, 63, 78  
Associated Students, 49, 51  
Astronomy, 14, 15  
Attorney for the Regents, 8, 50  
Authority of instructors, 41  
Bacteriology, 14  
Bancroft Library, 22  
Biochemistry, 14  
Biology (see under Botany, Physiology, Zoölogy)  
Biology Library, 21  
Bioradiology, 20  
Board and lodging, 52, 54  
Books and stationery, 50  
Botany, 14  
Bowles Hall, 53  
Brief leave, 47  
Bureau, of Business and Economic Research, 14  
    of International Relations, 14, 22  
    of Occupations, 54  
    of Public Administration, 14, 22  
    of School and College Placement, 55  
Business Administration  
    curriculum of the School of, 17, 113  
    minimum scholarship requirements, 43  
Calendar, 2, 3  
California Museum of Vertebrate Zoölogy, 14  
California School of Fine Arts, 15  
Candidacy for degrees, 2, 3, 41  
Ceramic engineering, 109  
Certificate of Completion, teacher-training curriculum, 7, 121  
Change of college or major, 41, 59  
Chemistry, aptitude test, 2  
    basic chemistry, major in, 94  
    chemical engineering, 94  
    curricula of the College of, 16, 92  
    food chemistry, 84  
    high school preparation recommended, 92  
    honors in, 92  
    library, 21  
    minimum scholarship requirements, 43  
Child development, 66, 83  
Citrus Experiment Station, 15  
City and regional planning, 14, 20  
Civil engineering, 16, 102  
Civilization of the Middle Ages, group major in, 66  
Civilization of the Nineteenth Century, group major in, 67  
Classics, 14  
Climate of Berkeley, 49  
Clothing and textiles, 83  
College Entrance Examination Board, 26, 29  
Colleges and departments of the University, 14, 16  
    change of, 41  
Communication and Public Policy, group major in, 67  
Composition, English, required, 36  
Coöperatives, 52

- Correspondence instruction, 21  
 Counseling Center, 55  
 Cowell, Ernest V., Memorial Hospital, 35  
 Credentials, teachers', 121  
 Credit, regulations concerning, 42  
   by examination, 45  
 Criminology, School of, 14, 17, 116  
   admission, 116  
   degrees in, 116  
   minimum scholarship requirements, 43  
   preparation for, 116  
 Crocker Radiation Laboratory, 14  
 Curricula, survey of, 16, 20
- Deans in the academic colleges, 9, 10  
 Decorative art, 14  
 Deficiencies, admission, 26  
   in university courses, 26  
 Degrees conferred in the several colleges  
   and schools, 14, 20  
   dates of application for, 2, 3  
   regulations concerning, 41  
 Dental hygienists, curriculum for, 18, 97  
 Dental service, 35  
 Dentistry, College of, 14, 18, 95  
   high school preparation recommended,  
   96  
   tuition fee, 50  
 Departments of instruction, 14  
 Design (see Engineering, Architecture,  
   Art, and Decorative Art)  
 Dietetics, 18, 84, 151  
 Discipline, 48  
 Discontinuance without notice, 47  
 Dismissal, honorable, 47  
   by scholarship\*delinquency, 43  
 Dormitories, 53, 54  
 Dramatic art, 14  
   major in dramatic literature, 68
- East Asiatic studies, 68  
 Economics  
   agricultural, curriculum in, 87  
   social, 75, 149  
 Education, degrees, Master or Doctor of,  
   17  
   Library, 22  
   School of, 17, 121  
 Electrical engineering, 16, 104  
 Employment, 54, 55  
 Engineering, College of, 14, 16, 98  
   aeronautics, 106  
   agricultural, 99, 101  
   air conditioning, 106  
   automatic control, 106  
   automotive, 106  
   business administration, 104  
   ceramic, 109  
   chemical, 94  
   civil, 99, 102  
   communications, 104  
   construction, 103  
   coöperative study program, 110  
   degree requirements, 100  
   electrical, 100, 104  
   engineering design, 14  
   engineering physics, 100, 105  
   foreign students, entrance examination,  
   31  
   Freshman Status Examination, 98  
   high school preparation recommended,  
   98  
   honors, 110  
   illumination, 104  
   industrial, 100, 109  
   industrial electronics, 104  
   intercampus transfer, 99  
   irrigation, 103  
   Junior Status Examination, 98  
   library, 21  
   marine and naval architecture, 107  
   mechanical, 100, 106  
   mechanical design, 107  
   metallurgy, 100, 107  
   mineral exploration, 16, 100, 107  
   mineral technology, 14  
   mining, 100, 108  
   petroleum, 100, 108  
   physics, 105  
   power, 104  
   process engineering, 100, 107, 109  
   qualifying examination, 28  
   sanitary and municipal, 103  
   scholarship requirements, 43  
   structural, 103  
   thermodynamics, 107  
   transportation and traffic, 103, 110  
 English, examination in, for foreigners, 31  
   composition, 36  
   for admission, 24, 36  
   required for the Associate in Arts de-  
   gree, 62  
 Enrollment limitation, 29, 96, 99, 134  
 Entomology and parasitology, 82, 87  
 Entrance, examinations, 26, 30  
   requirements, 23, 33  
 Examinations, final, 45  
   credit by, 45  
   entrance, 26, 31  
   for foreign students, 31  
   medical, required, 34  
 Excuse for absence, 47  
 Exfoliative cytology, 136  
 Expenses of students, 49  
 Extension, University, 14, 21, 26, 63, 65
- Faculty advisers, 60  
 Failures and conditions, 42  
 Family economics, 84  
 Fees, application, 23, 31  
   commutation of, 51  
   exemption from tuition, 51  
   for Subject A course, 36  
   general, 49  
   incidental, 50  
   laboratory, 50  
   late registration, 31  
   nonresident, 51  
   professional schools, 50  
   refunds, 52  
   tuition, 51

- Fellowships and scholarships, 57  
     requirements, 23, 30  
 Final examinations, regulations concern-  
     ing, 45  
 Fine Arts, California School of, 15  
     for Associate in Arts degree, 62  
 Food chemistry and technology, 84  
 Food science, 82  
 Food technology, 82, 84, 87  
 Foreign language, credit in, for foreign  
     students, 31  
     for admission, 24  
     required for Associate in Arts degree,  
     62  
     in the College of Chemistry, 92, 93  
 Foreign students  
     admission from foreign schools, 31  
     admission requirements for the College  
     of Engineering, 31  
     American History and American Insti-  
     tutions, 37  
     examination in English, 30  
     language credit in mother tongue, 31  
     living accommodations, 54  
     special advisers for, 31  
 Forestry, School of, 17, 43, 127  
     library, 21  
 Fraternities, 54  
 French, 14  
  
 General curriculum, 59, 64  
 General information, 49  
 General Elementary credential, 125  
 General Junior High School credential,  
     126  
 General Secondary credential, 122  
 Geography, 14  
 Geological sciences, 14  
 German, 14  
 Government, of the University, 15  
 Grade points, 43  
 Grades of scholarship, 42  
 Graduate Division, 30, 44, 154  
 Graduate fellowships and scholarships, 57  
 Graduate in Architecture, degree of,  
     17, 90, 91  
 Greek, 14  
 Group majors, 66, 76  
 Gymnasiums, 36  
  
 Hastings College of the Law, 15, 17  
 Health service, 84  
 Heller Committee for Research in Social  
     Economics, 14  
 High school program required for admis-  
     sion, 24  
 Higher degrees, 154  
 History, for admission, 24  
     for graduation, 37  
 Home Economics, curriculum in, 83, 88  
 Honorable dismissal, 47  
 Honorable mention, with degree of Associ-  
     ate in Arts, 63, 78  
 Honors, 41, 63, 78, 79, 90, 92, 110, 116,  
     148  
  
 Hooper Foundation, Medical Research,  
     15, 32  
 Hospital, Ernest V. Cowell Memorial, 35  
     dietetics, 19, 151  
     University, 15, 18  
 Household science, major requirements  
     (see Home Economics)  
 Housing, 52, 54  
 Hygiene (see Public Health)  
  
 Illumination, 104  
 Incidental fee, 50  
 Indefinite leave of absence, 47  
 Industrial electronics, 104  
 Industrial engineering, 100, 109  
 Institute, of Child Welfare, 14  
     of East Asiatic Studies, 14  
     of Engineering Research, 14  
     of Experimental Biology, 14  
     of Geophysics, 14  
     of Industrial Relations, 14, 152  
     of Slavic Studies, 14, 153  
     of Transportation and Traffic Engineer-  
     ing, 14  
 Instruction, organization of, 14, 20  
 Instructors, authority, 41  
 International House, 54  
 International Relations, Bureau of, 14, 22  
     major in, 68  
 Irrigation, 103  
 Irrigation science, 84, 88  
 Italian, 14  
  
 Journalism, 14, 20  
 Junior College credential, 124  
  
 Labor and industrial relations, group  
     major in, 69  
 Laboratory fees, 50  
 Laboratory science, for Associate in Arts  
     degree, 61  
     for admission, 24  
 Laboratory technicians, 136, 137, 145  
 Landscape architecture, 84, 88  
 Langley Porter Clinic, 14  
 Languages, credit in, for a foreign stu-  
     dent, 31  
     foreign, for admission, 24  
     for the Associate in Arts degree, 62  
 Late admission, 31  
 Late registration, 31  
 Latin, 14  
 Law, School of, 17, 130  
     admission test, 131  
     degrees in, 17  
     Hastings College of the, 15, 18  
     preparation for, 130  
 Leave of absence, 47  
 Letters and Science, College of, 59  
     high school preparation recommended,  
     25  
     honors, 78  
     list of courses, 77  
     requirements for degrees in, 61  
     requirements for majors in, 61, 76  
     scholarship requirements, 43  
     study-list regulations, 60

- Librarianship  
   School of, 17, 183  
 Library, 20  
 Lick Astronomical Department, 15, 32  
 Limitation of enrollment, 29, 96, 99, 134  
 Limits, study-list, 40, 60, 89  
 Living, accommodations, 52, 54  
   expenses, 53  
 Loans, 58  
 Location of campus, 49  
 Lodging and board, 52, 54  
 Los Angeles, departments at, 15  
   University of California, 20  
 Lower division  
   in the College of Letters and Science, 61
- Majors, change of, 41, 60  
   for the A.B. degree, 64  
   in the College of Agriculture, 80  
   in the School of Education, 121  
 Marine and naval architecture, 107  
 Mathematics  
   for Associate in Arts degree, 62  
   required for admission, 24  
 Matriculation, credit, 42  
   examinations, 26  
 Mechanical engineering, 16, 100, 106  
 Medical examination required, 34  
 Medical College Admission Test, 70, 134  
 Medical sciences, courses in (see Anatomy,  
   Biochemistry, Physiology)  
   major, 69, 71  
 Medical technology, 19, 137  
 Medicine, School of, 17, 50, 135  
   admission test, 70, 134  
   minimum scholarship requirements, 43  
   premedical curriculum, 71  
   tuition fee, 50  
 Metallurgy, 16, 100, 107  
 Military science and tactics, 39  
   required for Associate in Arts degree, 61  
 Minimum scholarship requirements, 43  
 Mining, curricula in, 16, 100, 108  
 Morrison Library, 22  
 Municipal engineering, 103  
 Museum, of Paleontology, 14  
   of Vertebrate Zoölogy, 14  
 Music, 14
- Natural science requirement, 61  
 Naval science, 40  
 Near eastern languages, 14  
 Nonmajor curriculum, 59, 64  
 Nonresident students, tuition fee for, 51  
 Nursing, curricula in, 18, 139  
   minimum scholarship requirements, 43  
   public health, 140, 141  
   nursing education, 140, 141  
   School of, 139, 141  
 Nutrition and dietetics, 84
- Observatory, 15  
 Oceanography, 15  
 Office of Teacher Placement, 55  
 Optometry, School of, 18, 44, 143
- Organization of instruction, 14, 20  
 Organization of the University, 14  
 Oriental languages, 14  
 Orthoptics, 137
- Paleontology, 14  
   Museum of, 14  
 Parasitology, 82, 87  
 Passing and non-passing grades, 43  
 Petroleum engineering, 16, 100, 108  
 Pharmacy, College of, 14, 19, 43, 50, 111  
 Philosophy, 14  
 Physical education, 14, 36, 71  
 Physical examination required, 34  
 Physical therapy, 138  
 Physics  
   high school preparation recommended,  
     24  
   library, 22  
 Physiological chemistry, 14  
 Physiology, 14  
 Plant science, 85, 89  
 Points, grade, 43  
 Political science, 14  
 Prerdental curricula, 96  
 Preforestry, 83, 88, 127  
 Prelegal preparation, 130  
 Premedical curriculum, 71  
 Preparation for University curricula, 25  
 Preveterinary science, 86, 89  
 Prizes, 58  
 Probation, 43  
 Process engineering, 100, 107, 109  
 Professional curricula, 16, 19, 61, 65  
 Psychology, 14  
 Public administration, 14, 22  
 Public Health, School of, 18, 140, 145  
   biostatistics, 146  
   curricula in, 18, 145  
   education, 145  
   honors, 148  
   laboratory, 147  
   library, 21  
   minimum scholarship requirements, 43  
   preadministration, 146, 147  
   sanitation, 147  
   nursing, 19, 139, 140
- Radiation Laboratory, 14  
 Range Management, curricula in, 85  
 Readmission after dismissal, 43  
 Recreation, group major in, 72  
 Reëxaminations, 45  
 Refunds of fees, 52  
 Regents, 7  
 Regional group majors, 72  
   China, 73  
   France and French colonies, 73  
   Germany and Central Europe, 73  
   Hispanic America, 73  
   Japan, 74  
   Russian and Eastern Europe, 74  
   Southeast Asia, 74  
 Registration, routine of, 34  
   late, 31

- Regulations concerning students in academic departments, 34-48
- Religion, 74
- Removal of deficiencies, 26, 28
- Renaissance, group major in, 75
- Reports of student grades, 43
- Requirements for admission, 23, 33  
for degrees (see under various colleges)
- Reserve Officers Training Corps, 38
- Residence, rules governing, 52  
requirements for degree, 41, 64
- Romanic languages (see under French, Italian, Spanish)
- San Francisco, departments at, 15
- Sanitary engineering, 103
- Sanskrit, 14
- Santa Barbara College, 15
- Scandinavian, 14
- Scholarship, grades of, 42  
minimum requirements of, 43  
requirements for admission, 23
- Scholarships and fellowships, 57
- Schools, 14, 17
- Science, degree of Bachelor of, 16  
requirements for, 80, 116
- Sciences (see under the various departments)  
for admission, 24  
for Associate in Arts degree, 62
- Scripps Institution of Oceanography, 15
- Sculpture, 75
- Selective Service, 57
- Self-support of students, 53
- Semitic languages (see under Near Eastern Languages)
- Senate, Academic, 15
- Site and climate of Berkeley, 49
- Slavic languages and literatures, 14
- Social Institutions, 14
- Social Sciences, for Associate in Arts degree, 62
- Social studies, 123
- Social welfare, 18, 75, 149
- Sociology and Social Institutions, 15
- Soils, 86, 89
- Sororities, 54
- Spanish, 14
- Special students, 30
- Speech, 14, 62
- Staff, administrative, 8, 12
- Stern Hall, 53
- Student body card, 50
- Student health service, 35
- Student conduct, 48
- Study-list regulations, 40, 60, 89
- Subject A, 36
- Summer sessions, 20, 26  
courses for the Associate in Arts degree, 63
- Supervised teaching, 122
- Survey of curricula, 16, 20
- Teacher placement, 55
- Teacher-training curricula, 121
- Technicians, 19, 137, 139, 145, 146
- Transcript of record, 47
- Transportation and Traffic Engineering, 103, 110
- Tuition, 51
- Undergraduate curricula, 16
- Units of work and credit, 42
- University Extension, 14, 21, 26, 63, 65
- University of California, Davis, 15
- University of California, Los Angeles, 15, 20
- Unsatisfactory scholarship, 43
- Upper division, 30  
in the College of Letters and Science, 60, 63
- Vaccination required, 32, 33
- Vegetable crops, 15
- Veterans information, 12, 56
- Veterinary medicine, 15, 18
- Visual instruction, 21
- Welfare, social, 18, 75, 149
- Wildlife conservation, group major in, 76
- Women's Athletic Association, 36
- X-ray technicians, 19, 139
- Year courses, 33  
required for Associate in Arts degree, 62
- Zoology, 14



**PART II**

**Announcement of Courses**

# **Announcement of Courses**

**Departments at Berkeley**

**Fall and Spring Semesters  
1954-1955**

**SEPTEMBER 10, 1954**

**UNIVERSITY OF CALIFORNIA, BERKELEY**

## CALENDAR\*

**Referring Primarily to the Departments of the University at Berkeley**

### FALL SEMESTER, 1954-1955

July 15, Thursday	Last day for filing credentials and applications for admission to graduate standing with the Dean of the Graduate Division.
July 15, Thursday	Last day for filing applications for readmission to graduate standing with the Dean of the Graduate Division.
Aug. 12, Thursday	Last day for filing applications for readmission to undergraduate status with the Registrar.
Aug. 16, Monday	Final date for applications for admission to the fall semester and credentials to be filed with the Director of Admissions. Credentials received as late as this may not be evaluated in time for the enrollment of the student during the regular registration period.
Sept. 6, Monday	Labor Day—an academic and administrative holiday.
Sept. 13, Monday	Fall semester begins.
Sept. 13, Monday	Subject A Examination, 2 to 5 p.m.
Sept. 14, Tuesday	Mathematics 3 and 3A Qualifying Examination, 4:15 to 5:45 p.m.
Sept. 14, Tuesday	Chemistry 1A Aptitude Test, 4:15 to 5:45 p.m.
Sept. 14, Tuesday Sept. 15, Wednesday Sept. 16, Thursday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the fall semester.
Sept. 20, Monday	Instruction begins.
Sept. 29, Thursday	All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in January, 1955, file announcement of candidacy before 5 p.m. at the office of the Registrar, Administration Building.
Oct. 1, Friday	Last day for filing applications in candidacy for all master's degrees to be conferred in January, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 8, Friday	Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 25, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in January, 1955; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Nov. 5, Friday	Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1955.
Nov. 25, Thursday	Thanksgiving Day—an academic and administrative holiday.
Dec. 17, Thursday	Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in January, 1955.
Dec. 20, Monday	} Christmas recess—an academic holiday.
Jan. 1, Saturday	} Christmas Holiday—academic and administrative.
Dec. 24, Friday	} Christmas Holiday—academic and administrative.
Dec. 25, Saturday	} Christmas Holiday—academic and administrative.
Dec. 31, Friday	} New Year's Holiday—academic and administrative.
Jan. 1, Saturday	} New Year's Holiday—academic and administrative.
Jan. 3, Monday	Instruction resumes.

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

- Jan. 10, Monday Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1955-1956.
- Jan. 17, Monday } Final examinations in the departments at Berkeley.
- Jan. 27, Thursday }
- Jan. 27, Thursday Fall semester ends.

**SPRING SEMESTER, 1955**

- Dec. 15, Wednesday Last day for filing credentials and applications for admission to graduate standing with the Dean of the Graduate Division.
- Dec. 15, Wednesday Last day for filing applications for readmission to graduate standing with the Dean of the Graduate Division.
- Jan. 6, Thursday Last day for filing applications for readmission to undergraduate status with the Registrar.
- Jan. 15, Saturday Applications for admission to the spring semester and credentials to be filed with the Director of Admissions.
- Feb. 7, Monday Spring semester begins.
- Feb. 8, Tuesday } Registration of students, graduate and undergraduate, in the
- Feb. 9, Wednesday } departments at Berkeley for courses of the spring semester.
- Feb. 10, Thursday } Instructor begins.
- Feb. 14, Monday } Last day for filing applications for fellowships and graduate
- Feb. 15, Tuesday } scholarships for 1955-1956.
- Feb. 22, Tuesday Washington's Birthday—an academic and administrative holiday.
- Feb. 24, Thursday All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in June, 1955, file announcement of candidacy before 5 p.m., at the office of the Registrar, Administration Building.
- Feb. 25, Friday Last day for filing applications in candidacy for all master's degrees to be conferred in June, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
- Mar. 1, Tuesday Last day for entering students to file applications for undergraduate scholarships for 1955-1956.
- Mar. 4, Friday Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1956; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
- Mar. 7, Monday Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula, to be received in June, 1955; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
- Mar. 25, Friday Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1955.
- Apr. 25, Monday } Spring recess—an academic holiday.
- Apr. 30, Saturday }
- May 16, Monday } Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in June, 1955.
- May 30, Monday Memorial Day—an academic and administrative holiday.
- June 6, Monday } Final examinations in the departments at Berkeley.
- June 16, Thursday }
- June 16, Thursday Spring semester ends.

## CONTENTS

	PAGE
Calendar . . . . .	2
Letters and Science List of Courses . . . . .	7
Courses of instruction offered in the departments at Berkeley . . . . .	9
Explanatory Note . . . . .	9
Agricultural Chemistry . . . . .	11
Agricultural Economics . . . . .	11
Agricultural Engineering . . . . .	15
Agronomy . . . . .	15
Air Science . . . . .	15
Anatomy . . . . .	18
Anthropology . . . . .	20
Architecture . . . . .	25
Art . . . . .	30
Astronomy . . . . .	36
Bacteriology . . . . .	39
Biochemistry . . . . .	41
Plant Biochemistry . . . . .	42
Physiological Chemistry . . . . .	42
Botany . . . . .	48
Business Administration . . . . .	52
Chemistry and Chemical Engineering . . . . .	62
Child Development . . . . .	71
City and Regional Planning . . . . .	72
Classics . . . . .	73
Greek . . . . .	74
Latin . . . . .	74
Comparative Literature . . . . .	78
Criminology . . . . .	80
Decorative Art . . . . .	83
Dramatic Art . . . . .	86
Economics . . . . .	89
Education . . . . .	96
Emergency Medicine . . . . .	110
Engineering . . . . .	111
English . . . . .	154
Entomology and Parasitology . . . . .	163
Food Technology . . . . .	167
Foreign Literature in Translation . . . . .	168
Forestry . . . . .	169
French . . . . .	173
Genetics . . . . .	177
Geography . . . . .	178
Geological Sciences . . . . .	181

	PAGE
German . . . . .	188
History . . . . .	192
Home Economics . . . . .	201
Horticulture . . . . .	206
Italian . . . . .	206
Journalism . . . . .	208
Landscape Architecture . . . . .	212
Law . . . . .	214
Librarianship . . . . .	217
Linguistics . . . . .	222
Mathematics . . . . .	224
Military Science and Tactics . . . . .	239
Music . . . . .	243
Naval Science . . . . .	251
Near Eastern Languages . . . . .	253
Nursing . . . . .	255
Oceanography . . . . .	259
Optometry . . . . .	259
Oriental Languages . . . . .	263
Paleontology . . . . .	268
Philosophy . . . . .	272
Physical Education . . . . .	276
Physics . . . . .	282
Physiology . . . . .	290
Plant Nutrition . . . . .	293
Plant Pathology . . . . .	294
Political Science . . . . .	296
Pomology . . . . .	311
Poultry Husbandry . . . . .	311
Psychology . . . . .	312
Public Health . . . . .	323
Range Management . . . . .	332
Romance Philology . . . . .	334
Scandinavian . . . . .	335
Slavic Languages and Literature . . . . .	337
Social Welfare . . . . .	341
Sociology and Social Institutions . . . . .	346
Soils . . . . .	353
Spanish and Portuguese . . . . .	356
Speech . . . . .	360
Subject A: English Composition . . . . .	364
Vegetable Crops . . . . .	365
Zoölogy . . . . .	365
◇	
Index . . . . .	373

# THE UNIVERSITY OF CALIFORNIA

## LETTERS AND SCIENCE LIST OF COURSES

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

Courses not on the list, but taken for credit to satisfy a general University requirement established by the Board of Regents, will be accepted as equivalent to courses in the Letters and Science List up to a maximum of eight units.

Any course not included in the Letters and Science List of Courses, but required, or accepted, as part of a major or group major or as a prerequisite therefor, shall, for students offering that major or group major at graduation, but for no others, be treated as if it were in the Letters and Science List of Courses.

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

- |   |   |
|---|---|
| <p>Agricultural Economics 112A, 112B, 120.</p> <p>Anatomy. All undergraduate courses.</p> <p>Anthropology. All undergraduate courses.</p> <p>Architecture 5A, 5B, 5C, 5D, 14A, 14B, 117, 121, 122, 140, 141, 142, 143, 146, 148, 149.</p> <p>Art. All undergraduate courses.</p> <p>Astronomy. All undergraduate courses except 3 and 11.</p> <p>Bacteriology. All undergraduate courses.</p> <p>Biochemistry. All undergraduate courses.</p> <p>Botany. All undergraduate courses except 155.</p> <p>Business Administration 1A, 1B, 10, 18, 100, 150.</p> <p>Chemistry and Chemical Engineering. All undergraduate courses except 143, 144, 145A, 145B, 146A, 146B, 147, 149, 152.</p> <p>City and Regional Planning. All undergraduate courses.</p> <p>Classics. All undergraduate courses.</p> <p>Comparative Literature. All undergraduate courses.</p> <p>Decorative Art. All undergraduate courses.</p> <p>Disaster Medicine (see Emergency Medicine below).</p> <p>Dramatic Art. All undergraduate courses except 190, 191, 192, 193.</p> <p>Economics. All undergraduate courses.</p> <p>Education 108, 110 and not more than 3 units from 101, 102, 105.</p> <p>Emergency Medicine 121A-121B.</p> | <p>English. All undergraduate courses.</p> <p>Entomology 100, 106, 110, 112, 117, 119, 126, 127, 129, 131, 133.</p> <p>Forestry 1, 103, 122, 125.</p> <p>French. All undergraduate courses except 20.</p> <p>Genetics. All undergraduate courses.</p> <p>Geography. All undergraduate courses.</p> <p>Geological Sciences. All undergraduate courses.</p> <p>German. All undergraduate courses.</p> <p>Greek. All undergraduate courses.</p> <p>History. All undergraduate courses.</p> <p>Italian. All undergraduate courses.</p> <p>Journalism 120A, 120B, 140, 141, 190, 195, 199.</p> <p>Latin. All undergraduate courses.</p> <p>Linguistics. All undergraduate courses.</p> <p>Mathematics. All undergraduate courses except 7, 107, 142A, 142B, 142C, 142D, 144.</p> <p>Music. All undergraduate courses; a total of not more than 8 units from the following courses will be accepted as Letters and Science credit: 43, 48, 143, 148.</p> <p>Near Eastern Languages. All undergraduate courses.</p> <p>Optometry (see Physiological Optics, below).</p> <p>Oriental Languages. All undergraduate courses.</p> <p>Paleontology. All undergraduate courses.</p> <p>Philosophy. All undergraduate courses.</p> <p>Physical Education 105.</p> |
|---|---|

- Physics. All undergraduate courses except 125, 128, 131.
- Physiological Optics 105A, 105B, 106A, 106B.
- Physiology. All undergraduate courses.
- Plant Biochemistry 123.
- Plant Nutrition 115, 117.
- Political Science. All undergraduate except 183.
- Psychology. All undergraduate courses except 3, 104, 114, 116, 117, 180, 185, 186.
- Public Health 5A, 5B, 35, 106, 160A, 160B, 163.
- Sanskrit. All undergraduate courses.
- Scandinavian. All undergraduate courses.
- Slavic Languages and Literatures. All undergraduate courses.
- Social Welfare 100, 106, 110A, 110B.
- Sociology and Social Institutions. All undergraduate courses.
- Soil Science 110, 111, 112, 113, 114.
- Spanish and Portuguese. All undergraduate courses.
- Speech. All undergraduate courses.
- Zoölogy. All undergraduate courses except 109, 116, 119A-119B, 120A-120B, 145.



# COURSES OF INSTRUCTION\* OFFERED IN THE DEPARTMENTS AT BERKELEY FOR FALL AND SPRING SEMESTERS ACADEMIC YEAR 1954-1955

## Explanatory Note

THE CREDIT VALUE of each course in semester units is indicated for each semester by a number in parentheses following the title. A semester unit is one hour of the student's time at the University, weekly, during one semester, in lecture, or recitation, together with the time necessary in preparation therefor; or a longer time in laboratory or other exercises not requiring preparation. The session in which the course is given is shown as follows: I, first semester (September to 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; double numbers.*—A course designated by a double number (for example, History 4A-4B) is continued through two successive semesters, ordinarily from September to June; occasionally, however, the first part of a year course may begin in February. The student should use the first number in registering for the course during its first semester, and the second number during its second semester. The first half of such a course is prerequisite to the second half unless there is an explicit statement to the contrary. A final report is made by the instructor at the end of each semester. The student may discontinue the course at the end of the first semester, with final credit for the first half of the course, except as otherwise noted.

### Classification and Numbering of Courses—

Courses are classified and numbered as follows:

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

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

Special study courses for individual advanced undergraduates, usually numbered 199, should be restricted to senior honor students having an adequate background in the subject proposed for special study. This would normally require a sound background in upper division courses in the field of 199 course study.

The maximum number of units per student in any and all 199 courses in any one semester shall be limited to five.

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

\* For information concerning general University requirements for degrees and major requirements of colleges and schools at Berkeley, see the CIRCULAR OF INFORMATION.

honors course may consist of additional work in connection with other courses of instruction, or may be independent of such courses.

(3) *Graduate courses* (numbered 200-299). As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation normally consists of the completion of at least 12 units of upper division work basic to the subject of the graduate course, irrespective of the department in which such basic work may have been completed.

(4) *Professional teacher-training courses* in the Department of Education and courses in other departments that are specially intended for teachers or prospective teachers (numbered 300-399).

(5) *Certain professional courses* in anthropology, dramatic art, engineering, home economics, music, nursing, optometry, public health, and social welfare (numbered 400-499).

Courses are further classified as follows:

*Resident courses.*—Courses of resident instruction are given either during regular sessions or summer sessions or (by special arrangement) as extra-session courses. Laboratory, field, or other individual work, done out of session under the direction of a department of instruction, may be accepted upon the recommendation of the department in partial fulfillment of the residence requirement for the bachelor's degree. All such work is in the form of upper division or graduate extra-session courses, and these courses must be approved in advance by the Committee on Courses of Instruction. Moreover, in pursuance of existing regulations, students must register in advance for all such work, and this registration must be approved by the proper faculty before the work is undertaken.

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

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

# AGRICULTURAL CHEMISTRY

## GRADUATE COURSE

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

The Staff (including all members of the Graduate Agricultural Chemistry Group)

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

# AGRICULTURAL ECONOMICS

(Department Office, 207 Giannini Hall)

Murray R. Benedict, Ph.D., *Professor of Agricultural Economics.*

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

Chester C. Davis, A.B., LL.D., Sc.D., *Regents Professor of Agricultural Economics for the spring semester.*

Trimble R. Hedges, Ph.D., *Professor of Agriculture, Davis.*

Sidney S. Hoos, Ph.D., *Professor of Agricultural Economics.*

<sup>a</sup> George M. Kuznets, Ph.D., *Professor of Agricultural Economics.*

George L. Mehren, Ph.D., *Professor of Agricultural Economics.*

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

Siegfried V. Wantrup, Dr.Agr., *Professor of Agricultural Economics.*

\*David Weeks, Ph.D., *Professor of Agricultural Economics.*

Harry R. Wellman, Ph.D., *Professor of Agricultural Economics.*

Richard L. Adams, M.S., D.Sc. (hon.c.), *Professor of Farm Management, Emeritus.*

Henry E. Erdman, Ph.D., *Professor of Agricultural Economics, Emeritus.*

Varden Fuller, Ph.D., *Associate Professor of Agricultural Economics.*

Ivan M. Lee, Ph.D., *Associate Professor of Agricultural Economics.*

J. Herbert Snyder, Ph.D., *Instructor in Agricultural Economics, Davis.*



Guy Black, Ph.D., *Lecturer in Agricultural Economics.*

David A. Clarke, Jr., Ph.D., *Lecturer in Agricultural Economics.*

James B. Hassler, Ph.D., *Lecturer in Agricultural Economics.*

Hendrick S. Konijn, M.A., *Lecturer in Agricultural Economics.*

Knowles A. Ryerson, M.S., *Professor of Horticulture.*

Paul S. Taylor, Ph.D., *Professor of Economics.*

*Letters and Science List.*—Courses 112A-112B, 120 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Fuller and Mr. Clarke.

*Preparation for the Major.* See page 86 of the CIRCULAR OF INFORMATION.

*Upper Division Courses.*—All upper division courses announced by the De-

\* Absent on leave, 1954-1955.

<sup>a</sup> In residence spring semester only, 1954-1955.

partment presuppose at least junior standing in the College of Agriculture. Juniors and seniors in other colleges may elect such courses in the College of Agriculture as they are qualified to pursue.

To graduate with a major in agricultural economics, a student must have at least a 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.

*Honors.*—Students who become candidates for the bachelor's degree in the College of Agriculture may be recommended for honors on the basis of the quality of the work done in the regular curriculum.

*Graduate Work.*—Concerning conditions for admission to graduate courses see page 10 of this bulletin. Students who intend to become candidates for higher degrees in the College of Agriculture will be required to give evidence of the completion of an amount of work equivalent, in its value, to that required by the College of Agriculture for the degree of Bachelor of Science. The student is referred to the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, for details of graduate work in the various fields of agriculture.

#### LOWER DIVISION COURSE

25. Comparative World Agriculture. (3) II. Mr. Ryerson, Mr. Davis  
Survey of world agriculture, stressing the development of principal agricultural regions and the interrelations among physical environment, agricultural growth, and population. Tenure, credit, and land reform problems, and the development of backward regions.

#### UPPER DIVISION COURSES

- 100A. Economic Analysis in Agriculture. (3) I. Mr. Hoos  
Prerequisite: Economics 1A-1B, 2.  
The application of economic principles to problems of agriculture: economic structure and aspects of American agriculture; analysis of demand, supply, production of agricultural products, with particular reference to the individual firm.
- 100B. Economic Analysis in Agriculture. (3) II. Mr. Mehren  
Prerequisite: course 100A.  
The application of economic principles to the problems of agriculture: economic pricing of agricultural output and productive services, including 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. Hassler  
Lectures and laboratory.  
Prerequisite: Economics 2, Mathematics 16A-16B or equivalent, or consent of 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. Black  
Prerequisite: Economics 1A-1B.  
Farmers' credit needs, methods of financing the agricultural industry, and the agencies supplying agricultural credit.
- 112A-112B. Rural Sociology. (2-2) Yr. Mr. Taylor  
The forms of human association in rural environment, including their origins, developments, structures, functions, and cultural products. Rural population, social organization and institutions, social psychology, ecology patterns, social change, social pathology.

120. Agricultural Policy. (3) II. Mr. Benedict  
Prerequisite: Economics 1A-1B.  
The evolution of agricultural policy in the United States. Historical and analytical treatment of principal farmer movements, legislative provisions for the betterment of agriculture, and current policy problems.
130. Agricultural Marketing. (3) I. Mr. Clarke  
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 markets and marketing.
140. Farm Management. (3) I. Mr. Hedges  
Survey of farm management: nature of the farm and the problems and methodology of farm management; organization aspects of the individual farm unit; administration of the farm business.
145. Land Economics and Farm Appraisal. (3) II. Mr. Snyder  
(Formerly numbered 102.)  
Lectures and laboratory.  
Prerequisite: Economics 1A-1B.  
The utilization of agricultural land, economic rent, land appraisal, political and economic problems of land development, land settlement, land policies. The relation of population growth to economic utilization of land and to land value.
156. Agricultural Economic Measurements. (3) II. Mr. Lee  
(Formerly numbered 105.)  
Prerequisite: course 106.  
Sources, collection of data, and analysis of selected measurements including parity prices, parity income, employment, wages, production and national income.
- 160A. Economics of Agricultural Marketing. (3) I. Mr. Clarke  
Prerequisite: courses 100A-100B, 106, 130.  
An analytical treatment of agricultural marketing; the marketing firm in its economic context; the theory of interregional trade; economic analysis of market organization.
- 160B. Economics of Agricultural Marketing. (3) II. \_\_\_\_\_  
Prerequisite: course 160A.  
An analytical treatment of agricultural marketing: collective marketing; government in marketing; the marketing system and the general economy.
- \*163. Coöperative Management. (3) I. \_\_\_\_\_  
Prerequisite: course 130, Business Administration 1A.  
Analysis of organizational and operational problems and policies of agricultural coöperative associations.
- \*170A. Economics of Farm Management. (3) I. Mr. Hedges  
Prerequisite: courses 100A-100B, 106, 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 analyses of earnings. Valuation and purchase.

\* Not to be given, 1954-1955.

175. Economics of Land Utilization. (3) II. Mr. Snyder  
Prerequisite: courses 145, 170A.  
An analytical treatment of land utilization; economic productivity of land; land rents and distribution theory; utilization patterns, margins, and determinants of intensities and types of use; conservation of natural resources; land valuation; relation of land use to population; national land policy.
180. Economics of Agricultural Policy. (3) II. Mr. Fuller  
Prerequisite: courses 100A-100B, 120.  
An analytical treatment of agricultural policy; economic appraisal of types of policies and policy problems; production, marketing and price; land, credit; markets, relations to national economic policy.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Fuller in charge)  
Prerequisite: senior standing and approval of the Department. Limited to agricultural economics majors.

## GRADUATE COURSES

202. Seminar in Agricultural Policy. (2) II. Mr. Fuller, Mr. Davis  
A study of public and semipublic activities pertaining to agriculture as an industry.
203. Research in Agricultural Economics. (1-6) I and II.  
The Staff (Mr. Bressler in charge)
- 204A-204B. Analytical Methods in Agricultural Economics. (3-3) Yr. \_\_\_\_\_, Mr. Lee  
Evaluation and treatment of economic data in agriculture, with emphasis on methods of analyzing relations between two or more variables.
205. Seminar in the Marketing of Agricultural Products. (2) II. Mr. Mehren  
An analysis of the economic effects of state and federal activity in the marketing of agricultural products.
- 206A. Economics of Agricultural Production. (3) I. Mr. Hoos  
A detailed study of the basic principles of the economics of production.
- 206B. Economics of Agricultural Production. (3) II. Mr. Benedict  
The application of economic principles to problems of production adjustment.
- \*207. Advanced Land Economics. (2) I. Mr. Weeks  
Land policies, planning, rent, tenure, appraisal, development, and utilization.
208. Seminar in the Conservation of Natural Resources. (2) II. Mr. Wantrup  
The economic and social aspects of conservation with particular reference to public policies.
209. Seminar in Agricultural Market Organization. (3) I. Mr. Bressler  
An analysis of the economic factors influencing organization and operating efficiency, price and sales policies, and the financial structure of different marketing organizations.

\* Not to be given, 1954-1955.

212. Seminar in Farm Management. (2) I. Mr. Hedges  
An analysis of economic factors, trends, and relationships which bear upon farm organization and administration; farm management techniques.
299. Special Study for Graduate Students. (1-4) I and II.  
The Staff (Mr. Bressler in charge)  
Any properly qualified graduate student who wishes to pursue a special field of study may do so if his proposed program of study is acceptable to the member of the staff with whom he works.

## AGRICULTURAL ENGINEERING

(Dean's Office, Agriculture, 133 Giannini Hall)

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



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

### LOWER DIVISION COURSE

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

## AGRONOMY

(Dean's Office, Agriculture, 133 Giannini Hall)

Maurice L. Peterson, Ph.D., *Associate Professor of Agronomy (Chairman of the Department), Davis.*  
Duane S. Mikkelsen, Ph.D., *Assistant Professor of Agronomy, Davis.*

### LOWER DIVISION COURSE

- \*1. Introduction to Agronomy. (3) I. Mr. Mikkelsen  
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.  
Given in the fall semester of even-numbered years.

## AIR SCIENCE

(Department Office, 222 Building T-9)

Edgar M. Scattergood, Jr., Colonel, U.S.A.F.; *Professor of Air Science (Chairman of the Department).*  
George W. Barnes, Jr., Major, U.S.A.F.; *Associate Professor of Air Science.*  
Roger B. Files, Lieutenant Colonel, U.S.A.F.; *Associate Professor of Air Science.*

---

\* Not to be given, 1954-1955.

Carl J. Roeser, Major, U.S.A.F.; *Associate Professor of Air Science.*  
 Winfield F. Tatro, Major, U.S.A.F.; *Associate Professor of Air Science.*  
 Dorwin C. Wilson, Major, U.S.A.F.; *Associate Professor of Air Science.*  
 Samuel H. Lyons, Captain, U.S.A.F.; *Assistant Professor of Air Science.*  
 Edwin G. Triner, Captain, U.S.A.F.; *Assistant Professor of Air Science.*

#### LOWER DIVISION COURSES

The lower division or basic courses in Air Science meet the requirements established by the Regents for military training in the first and second undergraduate years. Enrollment in Air Science is limited to students who are male citizens of the United States apparently physically fit for military service and less than 23 years of age at time of initial enrollment. The Air Science Basic course consists of 3 hours of formal instruction per week for two academic years. Uniforms and textbooks as required are provided by the government, and must be returned in good condition on completion of the course.

- 1A. Air Science I. (2) I. The Staff (Mr. Roeser in charge)  
 Introduction to A.F.R.O.T.C. program; introduction to aviation, including basic principles of flight; fundamentals of global geography to include evolution of geographical knowledge, geographical basis of power and military aspects of global geography; and basic military training.
- 1B. Air Science I. (2) II. The Staff (Mr. Roeser in charge)  
 Course 1A is not prerequisite to 1B.  
 International tensions and security structures and the role of the United States in world leadership; instruments of national military security, including the place of air power in modern war; and basic military training.
- 21A. Air Science II. (2) I. The Staff (Mr. Wilson in charge)  
 Prerequisite: courses 1A and 1B, or their equivalent.  
 Elements of aerial warfare, including identification of military aircraft; study of the various types of aerial weapons; study of types and designs of delivery aircraft; and leadership laboratory for cadet non-commissioned officers' training.
- 21B. Air Science II. (2) II. The Staff (Mr. Wilson in charge)  
 Prerequisite: courses 1A and 1B or their equivalent.  
 The air as a medium for delivery of weapons and problems associated therewith; the air base as an operational site; combat and support organizations of the U.S.A.F.; Air Force officer careers; leadership laboratory for cadet noncommissioned officers.

#### UPPER DIVISION COURSES

Students who have successfully completed the basic courses or have received credit in lieu thereof may apply for enrollment in the advanced course in Air Science. In general, students selected for this course are those who have shown potentials for leadership and command, whose aptitude and growth potential insures their development into efficient officer material and whose interest in becoming Air Force officers has been demonstrated. The advanced course consists of five hours of formal instruction per week for two academic years, but the student may expect that at least two additional hours per week will be required for extra activities not specifically covered in the formal program but essential in his over-all development as an officer. The number selected for enrollment in the advanced course may vary from year to year



and is dependent upon the quota allocated annually and the requirements of the United States Air Force for officers in various career fields. For admission to the upper division or advanced courses of Air Science, students must:

1. Be citizens of the United States and be regularly enrolled in the University of California.
2. Not have reached 25 years of age at the time of initial enrollment in the advanced course.
3. Be selected by the Professor of Air Science and the President of the University.
4. Successfully complete such survey or screening tests as may be prescribed.
5. Execute a written agreement with the government to complete the two-year advanced course, including attendance at summer camp; to accept a commission, if tendered, to serve on active duty for a period of not less than two years after receipt of such commission, subject to call by the Secretary of the Air Force and to remain a member of a Regular or Reserve component of the Air Force until the eighth anniversary of the receipt of such commission.
6. Pass successfully a prescribed physical examination.

Students intending to apply for air crew training (either pilot or observer) upon obtaining their commissions must meet the following additional requirements:

1. Be not more than 26½ years of age at anticipated date of graduation and commissioning.
2. Agree to participate in flight training portion of the course of instruction if any when offered.
3. Agree to accept an in-grade appointment to an Air Force Flight Training School subsequent to graduate and commissioning at a time convenient to the United States Air Force.
4. Pass such additional physical tests as may be prescribed including a visual acuity check and color vision test.

Students are required to attend a summer camp, normally of six weeks' duration, during the summer between their junior and senior years. Students attending this advanced summer camp will receive pay while in attendance at the rate of approximately \$75 per month, transportation allowance to and from camp, quarters, clothing, uniforms, meals, and medical service while at camp.

At the beginning of the advanced course (junior year), an officer-type uniform is furnished each student, which becomes his personal property upon his successful completion of the advanced course. During this two-year period, each student receives a monthly monetary allowance at a daily rate equal to the value of the commuted ration as announced by the Department of the Air Force (current rate is 90¢ per day.) The acceptance by the student of any of the monetary allowances listed above will make the completion of the advanced course a prerequisite to graduating from the University.

Any pay or allowances mentioned above are in addition to benefits received through the provisions of Public Law 346, providing the ceiling as limited by law on total income is not exceeded.

Successful completion of the advanced Air Force R.O.T.C. course and four years of education leading to the granting of a baccalaureate degree, qualify the student for appointment and commission by the President of the United States as a Second Lieutenant in the Air Force Reserve, subject to quota restrictions which may be in effect at that time.

For further information about the Air Force Reserve Officers' Training Corps, consult the Professor of Air Science, Room 216, Building T-9, Berkeley.

- 131A. Air Science III. (3) I. The Staff (Mr. Triner in charge)  
Prerequisite: courses 21A and 21B, or their equivalent.  
The Air Force commander and his staff; problem-solving techniques; communications media within the Air Force, emphasizing military correspondence, the communications process and teaching methods; military law, courts and boards; leadership laboratory for cadet officers.
- 131B. Air Science III. (3) II. The Staff (Mr. Triner in charge)  
Prerequisite: courses 21A and 21B, or their equivalent.  
Applied air science, including aerodynamics and propulsion, aerial navigation and basic meteorology; air base organization and functions; leadership laboratory for cadet officers.
- 141A. Air Science IV. (3) I. The Staff (Mr. Files in charge)  
Prerequisite: courses 131A and 131B, or their equivalent.  
Air Force career guidance; principles of leadership and management (pro-seminar); leadership laboratory for cadet officers.
- 141B. Air Science IV. (3) II. The Staff (Mr. Files in charge)  
Prerequisite: courses 131A and 131B, or their equivalent.  
Military aviation and the evolution of warfare; military aspects of world political geography; briefing for commissioned service; leadership laboratory for cadet officers.

## ANATOMY

### A Department of the School of Medicine

(Department Office, 4549 Life Sciences Building)

- \*William R. Lyons, Ph.D., M.D., *Professor of Anatomy.*
- \*William O. Reinhardt, A.B., M.D., *Professor of Anatomy.*
- John B. deC. M. Saunders, M.B., Ch.B., F.R.C.S. (Edin.), *Professor of Anatomy and Lecturer in Medical History and Bibliography (Chairman of the Department of Anatomy).*
- Miriam E. Simpson, Ph.D., M.D., Docteur h.c. (Aix-Marseille), *Professor of Anatomy.*
- Herbert McLean Evans, B.S., M.D., D.med. h.c. (Freiburg i.B., Santiago), Docteur h.c. (San Marcos, Paris), D.Sc. (Birmingham), *Professor of Anatomy, Emeritus, Morris Herzstein Professor of Biology, Emeritus, and Director of the Institute of Experimental Biology, Emeritus.*
- C. Willet Asling, Ph.D., M.D., *Associate Professor of Anatomy.*
- Alexei A. Koneff, M.D., *Associate Professor of Anatomy and Lecturer in Histological Technique.*
- Ian W. Monie, M.B., Ch.B. (Glas.), *Associate Professor of Anatomy.*
- Bill C. Garoutte, Ph.D., M.D., *Instructor in Anatomy.*



Geoffrey Wingfield Harris, M.A., M.D., Sc.D., F.R.S., *Visiting Professor of Anatomy.*

Ralph L. Hawkins, M.D., *Lecturer in Anatomy.*

*Letters and Science List.*—All undergraduate courses in anatomy are included in the Letters and Science List of Courses. For further information concerning this list, see page 7.

\* Absent on leave, 1954–1955.

## UPPER DIVISION COURSES

101. Histology and Microscopic Organology. (6) I.  
Miss Simpson in charge, Mr. Koneff, Mr. Harris  
Three laboratory and three lecture periods a week. Prescribed for students in the first year of the School of Medicine.  
Prerequisite: chemistry, physics, elementary biology or zoölogy, and either embryology or physiology, preferably embryology. Enrollment limited.
102. General Human Anatomy. (3) II. Mr. Hawkins  
Lectures and laboratory.  
Prerequisite: Zoölogy 1A or Physiology 1, 1L. Enrollment limited to two hundred students.  
Demonstration and laboratory study of prepared human dissections, models, and microscopic slides. Not open to freshmen or to premedical or pre dental students.
103. Neuroanatomy. (4) I.  
Mr. Saunders in charge, Mr. Hawkins, Mr. Garoutte, Mr. Harris  
Lectures and laboratory. Enrollment limited to twelve students.
105. Systematic Human Anatomy. (5) I.  
Mr. Asling in charge, Mr. Monie, Mr. Saunders  
Lectures. Prescribed for students in the first year of the School of Medicine. Enrollment limited. Course 105X must be taken concurrently.
- 105X. Systematic Human Anatomy (Laboratory). (6) I.  
Mr. Asling in charge, Mr. Monie, Mr. Saunders  
Prescribed for students in the first year of the School of Medicine; must be taken concurrently with course 105.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Miss Simpson and Mr. Asling in charge)

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

209. Human Embryology. I and II. Mr. Monie  
Credit to be arranged.  
Opportunity is offered for the study of specific problems in human embryology. Open only to students familiar with vertebrate embryology.
210. Physiological Anatomy of Reproduction. (2) I and II. Miss Simpson  
Two hours weekly.  
Informal conferences and demonstrations. Outside reading required.
211. Haematology. I and II. Miss Simpson  
Credit to be arranged.
212. Dynamic Morphology. I and II. Mr. Saunders  
Hours and credit to be arranged.  
Laboratory work, special reading, and informal conferences.
213. Original Investigation. I and II.  
The Staff (Miss Simpson and Mr. Asling in charge)  
Hours and credit to be arranged.  
Students who are prepared to undertake research in the anatomical sciences will be accorded facilities and encouragement by members of the staff.

214. Anatomy for Physicians and Advanced Students. (1-8) I and II.  
The Staff (Mr. Saunders in charge)  
This course is offered in Berkeley and San Francisco.

## ANTHROPOLOGY

(Department Office, 202 Building T-2)

- Theodore D. McCown, Ph.D., *Professor of Anthropology (Chairman of the Department) and Curator of the Museum of Anthropology.*  
David G. Mandelbaum, Ph.D., *Professor of Anthropology.*  
Ronald L. Olson, Ph.D., *Professor of Anthropology.*  
Edward W. Gifford, *Professor of Anthropology, Emeritus, and Director of the Museum of Anthropology, Emeritus.*  
A. L. Kroeber, Ph.D., Sc.D., L.H.D., LL.D., *Professor of Anthropology, Emeritus, and Director of the Museum of Anthropology, Emeritus.*  
Robert H. Lowie, Ph.D., ScD., *Professor of Anthropology, Emeritus.*  
<sup>1</sup>Robert F. Heizer, Ph.D., *Associate Professor of Anthropology, Director of the California Archaeological Survey, and Associate Curator of North American Archaeology (Vice-Chairman of the Department for the fall semester).*  
<sup>2</sup>John H. Rowe, Ph.D., *Associate Professor of Anthropology and Associate Curator of South American Archaeology.*
- ◇
- Darrell A. Amyx, Ph.D., *Associate Curator of Ancient Mediterranean Art and Associate Professor of Art.*  
George M. Foster, Jr., Ph.D., *Visiting Professor of Anthropology and Lecturer in Public Health.*  
Anna Hadwick Gayton (Anna Hadwick Gayton Spier), Ph.D., *Associate Professor of Decorative Art and Associate Curator of Textiles, Museum of Anthropology.*  
George A. Pettitt, Ph.D., *Lecturer in Anthropology.*  
H. R. W. Smith, Ph.D., *Associate Curator of Classical Archaeology and Professor of Latin and Classical Archaeology.*  
<sup>1</sup>Winfield S. Wellington, M.A., Gr.Arch., *Associate Curator of Art, Museum of Anthropology, Director of the Art Gallery, and Professor of Design in the Department of Decorative Art.*

*Letters and Science List.*—All undergraduate courses in anthropology are included in the Letters and Science List of Courses. For further information concerning this list, see page 7.

*Departmental Major Adviser:* Mr. Olson, fall semester; Mr. Rowe, spring semester.

*Preparation for the Major.*—Required: Anthropology 1, 2A-2B (10). Recommended: Geography 2, History 4A-4B; Oriental Languages 42; Sociology and Social Institutions 1, 2; Zoology 10. On the basis of the student's record in the lower division, the department will decide whether he will be permitted to make anthropology his major.

*The Major.*—Required: Anthropology 105A or 105B; 153; 101A-101B or 6 units from the following: 115, 139, 143A-143B, 147, and other courses aggregating 12 upper division units in anthropology; with substitution permitted

<sup>1</sup> In residence fall semester only, 1954-1955.

<sup>2</sup> In residence spring semester only, 1954-1955.

among these 12, on approval by the department of some definite plan, up to 6 units in allied subjects, as suggested by the following courses: Anatomy 102; Classics 197; Decorative Art 127, 175A, 193A; Geography 121A-121B, 122A-122B, 161; German 125; Linguistics 100, 130, 140, 145, 170; Oriental Languages 142; Paleontology 126; Philosophy 108, 147; Psychology 141, 145; Public Health 160A; Sociology and Social Institutions 141A-141B, 166, 167; Zoölogy 114, 115.

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

LOWER DIVISION COURSES

1. General Anthropology: Physical and Biological Factors. (4) I and II.  
Lectures and two section meetings a week. Mr. Heizer, Mr. McCown  
Human biology in terms of human evolution, fossil man, races, race differences, and problems.
- 2A-2B. General Anthropology: Cultural Factors. (3-3) Yr.  
Lectures and one section meeting a week. Mr. McCown, Mr. Olson  
2A. Prehistory and cultural growth. Mr. McCown  
2B. Cultural patterns and dynamics. Mr. Olson

UPPER DIVISION COURSES

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

- 101A-101B. Ethnography of the World. (3-3) Yr. Mr. Gifford  
A descriptive survey of representative primitive cultures, including backward peoples of civilized countries. Either half of the course may be taken independently.
- 105A-105B. The American Indians. (3-3) Yr. Mr. Heizer, Mr. Rowe  
Development, spread, and attainments of culture; native races and languages.  
105A. Central America, Mexico, and North America. Mr. Heizer  
105B. South America. Mr. Rowe  
Either half of the course may be taken independently.
- \*106. Archaeology of North America. (3) II. Mr. Heizer  
Prehistory of North American Indians; prehistoric culture areas; relations with historic Indians.
- \*111. Prehistory. (3) II. Mr. McCown  
Prerequisite: course 2A.  
Origin, development, and distribution in space and time of the prehistoric cultures of the Old World.
- \*115. Peoples of the Philippines and Indonesia. (3) II. Mr. Gifford  
Geography, races, populations, cultures, and development of the Philippines, as part of the larger Indonesian sphere of world history.
- 118A-118B. The Nature of Culture. (3-3) Yr. \_\_\_\_\_  
118A. The general structure and basic processes of cultural behavior; illustrative materials from primitive societies and modern civilizations.  
118B. The dynamics of cultural life; analysis of life history materials and contemporary events.  
Either half of the course may be taken independently.

\* Not to be given, 1954-1955.

- \*119. Problems in Culture and Personality. (3) II. Mr. Mandelbaum  
Prerequisite: courses 1, 2A-2B, or junior standing and consent of instructor.  
The interplay of cultural and personality factors in human development; personality in various cultural settings; the "national character" concept and other concepts in the field; techniques for the study of culture-personality relations.
- \*120. Language and Culture. (3) I. Mr. Rowe  
Language and thought; classification of languages; linguistic aspects of culture; language, nation, and state.
- \*124. Primitive Religion. (3) I. \_\_\_\_\_  
Comparative survey of religion and magic.
- 125A-125B. Comparative Society. (3-3) Yr. Mr. Olson  
The development of human society, with emphasis on the growth of modern institutions out of primitive kinship, social, and territorial units. Either half of the course may be taken independently.
- \*126. Invention and Technology. (3) II. Mr. Gifford  
Psychology of invention; origin, history, and spread of fundamental inventions; illustrative material from the Museum of Anthropology.
- \*137. Indians of California. (3) II. Mr. Heizer  
Origin and relationships of the natives; prehistoric remains; shell mounds. Tribal divisions; arts; customs; industry; beliefs.
- \*139. Africa. (3) I. Mr. Gifford  
Races; Egyptian, Mediterranean, and Negro cultures, past and present; native achievement; Asiatic relations and influences.
141. Mexico and Central America. (3) I. Mr. Olson  
Achievements of the Aztecs, Mayas, and their predecessors.
142. Peoples of the Andes. (3) II. Mr. Rowe  
Culture of the Incas of Peru and of other Andean peoples.
- 143A-143B. Peoples of India. (3-3) Yr. Mr. Mandelbaum  
Prerequisite: courses 1, 2A-2B, or junior standing.  
A survey of the principal culture groups of India. Problems of the primitive tribes, village life, religious affiliations, caste structure, and their relation to the contemporary scene in India.
- \*145. Peoples of Southeast Asia. (3) I. \_\_\_\_\_  
Peoples and cultures of Burma, Thailand, Indo-China and Malaya; survey and analysis of significant population groups and of the social factors operating in these countries.
147. Peoples and Cultures of the Pacific Islands. (3) II. Mr. Gifford  
Oceanian races and cultures; indigenous origins; Asiatic relations and influences.
- \*150A-150B. Physical Anthropology. (3-3) Yr. Mr. McCown  
Lecture and laboratory. Prerequisite: course 1.  
Evolutionary development of man; anthropometry; analysis of data; criteria of race. Enrollment limited to twelve students; primarily for major students in anthropology and the medical sciences.

\* Not to be given, 1954-1955.

- \*152. Fossil Man. (3) II. Mr. McCown  
 Prerequisite: course 1 or Paleontology 1.  
 Origin and relationships of the extinct forms of mankind.
153. Living Races of Man. (3) I. Mr. McCown  
 Physical characters, distribution, and relationships of the living races of mankind.
- \*161. Europe and the Mediterranean. (3) II. \_\_\_\_\_  
 Prerequisite: courses 1, 2A-2B, or junior standing.  
 The folk peoples and typical examples of higher cultures will be considered in modern and historical perspective from an anthropological point of view.
170. Primitive Education. (3) II. Mr. Pettitt  
 Methods and problems in the transmission of culture from generation to generation.
- 191A-191B. Spanish and Portuguese Culture in Europe and America. (3-3) Yr. Mr. Foster  
 Prerequisite: junior standing.  
 191A. Ethnographic treatment of historic and modern Iberian cultures emphasizing those factors contributing to the development of contemporary Latin American cultures.  
 191B. Survey of contemporary Latin American cultures stressing Iberian-Indian assimilation, development of folk societies, and the concept of "national" cultures.
- \*195. Field Course in Archaeological Method. (2) II. Mr. Heizer  
 Lectures, museum preparation, and week-end excavations.  
 Enrollment limited to eighteen students, admitted by consent of the instructor. With the consent of the instructor, may be repeated without duplication of credit.
- \*196. Archaeological Method. (2) I. Mr. Heizer  
 Prerequisite: course 195 and consent of instructor. Enrollment limited to twenty students. With the consent of the instructor, may be repeated without duplication of credit.  
 Museum preparation, advanced field investigation, and guidance in preparation of museum material for publication.
198. Preceptorial and Reading Course. (3) I and II. Mr. Mandelbaum, Mr. Rowe  
 Systematic readings in the history of anthropology and in significant modern developments within the field.  
 Open to seniors. With the consent of the instructor, may be repeated without duplication of credit.
199. Special Study for Advanced Undergraduates. (2-3) I and II. The Staff (Mr. Olson in charge)

RELATED COURSES IN OTHER DEPARTMENTS

- General Human Anatomy (Anatomy 102).  
 Evolution and Classification of Fossil Mammals (Paleontology 126).  
 Biometry (Public Health 160A).  
 Genetics (Zoölogy 114).  
 Human Genetics (Zoölogy 115).  
 India (Classics 197).  
 Civilizations of Eastern Asia (Oriental Languages 142).

\* Not to be given, 1954-1955.

- Oriental Societies (Sociology and Social Institutions 166).  
 Nomadic Societies (Sociology and Social Institutions 167).  
 Social Philosophy (Philosophy 108).  
 Theories of Historical Inquiry (Philosophy 147).  
 Personality in Society and Culture (Psychology 141).  
 Social Psychology (Psychology 145).  
 History of Western Social Organization (Sociology and Social Institutions 141A-141B).  
 Introduction to General Linguistics (Linguistics 100).  
 Phonetics and Phonemics (Linguistics 130).  
 American Indian Languages (Linguistics 170).  
 Types of Linguistic Structure (Oriental Languages 177).  
 Geography of Eastern North America (Geography 121A).  
 Geography of Western North America (Geography 121B).  
 Geography of Middle America (Geography 122A).  
 Geography of South America (Geography 122B).  
 Geography of Domesticated Plants and Animals (Geography 161).  
 Primitive Art (Decorative Art 127).  
 Primitive and Folk Textiles (Decorative Art 175A).  
 Historic Costume (Decorative Art 193A).  
 Introduction to Folklore (German 125).

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

206. Proseminar. (2) I and II. Mr. Heizer, Mr. McCown  
 Introduction to research. For new graduate students in anthropology.
- \*207A-207B. History and Theory of Anthropology. (2-2) Yr. Mr. Olson  
 Prerequisite: course 206.
- 209A-209B. Culture Problems of Eurasia and North America. (2-2) Yr.  
 Prerequisite: course 206. Mr. Olson
- \*215. Ethnological Field Techniques. (2) I. Mr. Rowe  
 Prerequisite: course 206 and consent of instructor.  
 The development of field methods in Anthropology. Applicability of techniques from other social science disciplines. Conceptual framework of field research. Work with an informant and practice in recording data.
- \*216. Problems in Archaeological Method. (2) II. Mr. Heizer  
 Prerequisite: course 206.  
 Techniques of analysis of archaeological data; critical review of excavation data and analytical results; continental perspective of Far Western prehistoric cultures.
- \*218H. Culture and Personality: the Psychological Approaches. (2) II.  
 Mr. Mandelbaum
- \*235. Problems in the Culture History of South America. (2) I. Mr. Rowe  
 Prerequisite: course 206.
- \*237. Culture Problems of Western North America. (2) I. Mr. Heizer  
 Prerequisite: course 206.  
 Work on problems of tribal distribution and cultures.
- 243A-243B. Culture Problems of India. (2-2) Yr. Mr. Mandelbaum  
 Prerequisite: course 206 or consent of instructor.
- \*245. Culture Problems of Southeast Asia. (2) II. \_\_\_\_\_  
 Prerequisite: course 206.

\* Not to be given, 1954-1955.



- \*247. Problems in Oceanian Anthropology. (2) I. Mr. Gifford  
 Prerequisite: course 206.  
 Survey of evidence available on various aspects of Oceanian cultures; significance of distributions; relationships with continental cultures.
253. Concepts and Problems in Physical Anthropology. (2) I. Mr. McCown  
 Prerequisite: course 206.  
 Systematic treatment of concepts in historical perspective and of continuing and new problems in the field of human biology as this concerns physical anthropology.
- 261A\*-261B. Problems in Acculturation. (2-2) Yr. Mr. Foster  
 Prerequisite: course 206 or consent of instructor.  
 Analysis of the forms and variety of culture changes originating in the contact of different ethnic groups.
265. Concepts and Problems in Applied Anthropology. (2) I. Mr. Foster  
 Prerequisite: course 206 or consent of instructor.  
 Survey and analysis of the use of anthropological concepts, techniques, and methods in such fields as public health and social welfare, technical aid programs, colonial administration, and related fields.
- \*279. Factors in Material Culture. (2) I. Miss Gayton  
 Prerequisite: course 206.  
 Analysis of the nature of the materials, techniques of manufacture, decorative elements and the uses of the total material manufactures of selected culture areas.
- \*290. Problems in the Culture History of Meso-America. (2) II. Mr. Heizer
299. Directed Research. (2-6) I and II. The Staff (Mr. McCown in charge)

**MUSEUM OF ANTHROPOLOGY**

The Museum of Anthropology, organized in 1901 with the Phoebe A. Hearst collections as nucleus, is in storage in six buildings on the campus. Major parts of the collections are in the temporary Anthropology Museum building, where special exhibits are occasionally arranged in connection with courses of instruction. The contents include 109,000 inventoried artifacts from native California, 61,000 from other parts of the New World, 43,000 from the Old World, 8,000 skeletal items, 17,000 photographs, paintings, and drawings, 2,700 phonograph records. The collections are available for study by scholars and advanced graduate students. Those interested in the Museum's facilities may address the Director, Mr. E. W. Gifford.

**ARCHITECTURE**

(Department Office, 1 Architecture Building)

- Ernest Born, M.A., *Professor of Architecture.*  
 Vernon A. DeMars, A.B., *Professor of Architecture.*  
 Michael A. Goodman, M.A., *Professor of Architecture.*  
 Raymond W. Jeans, M.A., *Professor of Architecture.*  
 Stafford L. Jory, Gr.Arch., *Professor of Architecture.*  
 Howard Moise, B.S., M.Arch., *Professor of Architecture.*  
 Jacques Schnier, M.A., *Professor of Sculptural Design.*  
 William W. Wurster, A.B., F.A.I.A., *Professor of Architecture (Chairman of the Department).*

\* Not to be given, 1954-1955.

<sup>1</sup> In residence fall semester only, 1954-1955.

William C. Hays, B.S., F.A.I.A., *Professor of Architecture, Emeritus.*  
 Warren C. Perry, B.S., F.A.I.A., *Professor of Architecture, Emeritus.*  
 E. Michael Czaja, M.Arch., *Associate Professor of Architecture.*  
 George A. Downs, M.F.A., *Associate Professor of Architecture.*  
 George P. Simonds, M.A., *Associate Professor of Architecture.*  
 Harold A. Stump, A.B., *Associate Professor of Architecture.*  
 James S. Ackerman, Ph.D., *Assistant Professor of Art and Architecture.*  
 Kenneth H. Cardwell, A.B., *Assistant Professor of Architecture.*  
 Henry J. Lagorio, M.A., *Assistant Professor of Architecture.*  
 Stefan A. Novak, M.A., *Assistant Professor of Architecture.*  
 Richard O'Hanlon, *Assistant Professor of Sculptural Design.*  
 Philip Thiel, B.Arch., *Instructor in Architecture.*



Jorge Arango, *Lecturer in Architecture.*  
 Scott Beamer, B.S., *Lecturer in Architectural Mechanics.*  
 Theodore C. Bernardi, A.B., *Lecturer in Architecture.*  
 Joseph Esherrick, B.Arch., *Lecturer in Architecture.*  
 Gershon L. Gendler, B.M.E., *Lecturer in Architectural Mechanics.*  
 Carl G. Kolbeck, A.B., *Lecturer in Architecture.*  
 James M. Leefe, B.Arch., *Lecturer in Architecture.*  
 Jesse Reichel, *Lecturer in Architecture.*  
 Karl V. Steinbrugge, B.S., *Lecturer in Structural Design.*  
 Gordon Stephenson, A.B., M.C.P., *Visiting Professor of City and Regional Planning, Architecture, and Landscape Architecture.*  
 James L. Stratta, B.S., *Lecturer in Structural Design.*  
 H. Leland Vaughan, B. of L.A., *Professor of Landscape Architecture.*  
 Francis Violich, B.S., *Associate Professor of City and Regional Planning and Lecturer in Landscape Architecture.*  
 Clark Winter, M.F.A., *Visiting Associate Professor of Sculptural Design.*

*Letters and Science List*—Courses 5A, 5B, 5C, 5D, 14A, 14B, 117, 121, 122, 140, 141, 142, 143, 146, 148, and 149 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Students must complete a History of Architecture requirement for the professional curriculum:

*For the former four-year curriculum:* Courses 5A, 5B, 5C, 5D and 6A, 6B, 6C, 6D. No course of either series is prerequisite to another. Courses of the 5 series must be accompanied by the corresponding 6 series course, the latter open to architecture majors only.

*For the five-year curriculum:* Courses 121, 122, and one intensive period study of the student's selection from courses 123 to 130 inclusive, of which only course 125 is presently established.

Credit in courses 11, 12, 13, 112 will be allowed up to a total of 4 units each; but in no semester will more than 1 unit be allowed in any one of these courses.

All "Design" courses beginning with Architecture 3N through Architecture 102B require a grade of C or better for advancement to the succeeding course. A grade of D will require one more semester of Design at the same level, for which no further unit credit can be granted. Improvement in grade, however, will be recognized in all cases, and grade points received as earned for Lower Division courses only, in accordance with University regulations.

## LOWER DIVISION COURSES

- 1N. Design. (3) I and II. Mr. Reichel, Mr. Thiel, Mr. DeMars, Mr. Arango  
(Formerly numbered 1.)  
Seven hours weekly. Lecture, freehand drawing and drafting practice.  
Study of architectural forms and composition.
- 2N. Design. (3) I and II. Mr. Reichel  
Prerequisite: course 1N or equivalent.  
Six hours weekly. Continuation of course 1N with emphasis on color,  
texture, and three dimensional concept.
- 3N. Design. (3) I and II. Mr. Cardwell, ———, Mr. Kolbeck  
Prerequisite: course 2N.  
Six hours weekly. Elementary design of buildings.
- 4N. Design. (4) II. ———, ———  
Prerequisite: course 3N or 4 or 23.  
Eight hours weekly. Design of buildings. Continuation of course 3N  
with increasing scope of problems.
4. Elementary Design and Theory. (4) I. Mr. Moise  
Prerequisite: courses 1, 2 or 2P, 3.  
Eight hours weekly.
- 5A. Architecture of Ancient and Classic Times. (2) II. Mr. Jory  
Students may not receive credit for both courses 5A, 5B, and course  
121.
- 5B. Architecture of the Dark Ages and the Middle Ages. (2) I. Mr. Moise  
Students may not receive credit for both courses 5A, 5B, and course  
121.
- 5D. Architecture and Allied Arts of Modern Times. (2) II. Mr. Moise  
The background and development of contemporary forms of expres-  
sion with an examination of the social, economic, technological, and ar-  
tistic influences affecting them.  
Students may not receive credit for both courses 5C, 5D, and course  
122.
- 5N. Introduction to the Professions of Architecture, City and Regional Plan-  
ning and Landscape Architecture. (2) I.  
Mr. Wurster, Mr. Cardwell, Mr. Violich, Mr. Vaughan  
Lectures in charge of each department chairman introductory to each  
professional field.
- 6B. Classwork in Medieval Architecture. (1) I. Mr. Simonds, Mr. Stump
- 6D. Classwork in Architecture and Allied Arts of Modern Times. (1) II.  
Mr. Simonds, Mr. Stump
- 6N. Descriptive Geometry. (2) I and II. Mr. Lagorio  
(Equivalent to 2 units of courses formerly numbered 2 or 2P).  
Prerequisite: solid geometry.  
Four hours weekly. Lectures, drafting and problem solution.
7. Shades, Shadows and Perspective. (2) I and II. Mr. Cardwell, Mr. Kolbeck  
(Equivalent to 2 units of course formerly numbered 3).  
Prerequisite: course 6N or courses formerly numbered 2 or 2P.  
Four hours weekly. Lectures, drafting and problem solution.

11. Graphics. (1) I and II. Mr. Born, Mr. Thiel, Mr. Stump, ——  
 (Formerly numbered 115.)  
 Prerequisite: Art 2A or equivalent.  
 Three hours weekly.  
 Freehand drawings and rendering in pencil, crayon, charcoal, with varying emphasis in the various sections as determined by the instructor.
12. Graphics. (1) I and II. Mr. Czaja, Mr. Jory, Mr. Goodman, Mr. Reichek, Mr. Thiel  
 Three hours weekly.  
 Prerequisite: Art 2A or equivalent.  
 Painting and rendering in color with varying emphasis in the various sections as determined by the instructor.
13. Graphics. (1) I and II. Mr. Goodman, Mr. Jeans, Mr. Lagorio  
 Three hours weekly.  
 Prerequisite: Art 2A or equivalent.  
 Freehand drawing and rendering in black and white with varying emphasis in the various sections as determined by the instructor.
- 14A-14B. Elements of Sculpture. (2-2) Yr. Beginning each semester.  
 Six hours weekly. Mr. Schnier, Mr. O'Hanlon, Mr. Novak, Mr. Winter  
 14A. Introduction to basic elements of volume design using non-objective and representational subject matter in three dimensions and relief.  
 14B. An introduction to space design and materials with construction in wood, metal and plaster.
23. Design. (5). I and II. Mr. Czaja  
 Nine hours weekly.  
 Prerequisite: courses equivalent to 1N and 2N. Open only to transfer students.  
 A concentration of courses 2N and 3N to prevent or minimize extension of time of graduation because of transfer to this College.

## UPPER DIVISION COURSES

The general prerequisite for upper division courses is junior standing.

- 101A-101B. Design and Theory. Junior Problems. (5-5) Yr. Beginning each semester. Mr. Jory, Mr. Esherrick, Mr. Lagorio, Mr. Stump, Mr. Leefe  
 Eight hours weekly.  
 Prerequisite: courses 1, 2, 3, and 4.
- 102A-102B. Design and Theory: Senior Problems. (5-5) Yr. Beginning each semester.  
 Mr. Born, Mr. Goodman, Mr. DeMars, Mr. Arango, Mr. Bernardi  
 Eight hours weekly.  
 Prerequisite: course 101A-101B.
- 108A-108B. Architectural Mechanics. (3-3) Yr.  
 Mr. Beamer, Mr. Gendler, Mr. Soroka, Mr. Black  
 Prerequisite: course 4, Physics 2A-2B.
110. The House. (1) I and II. Mr. Jeans, Mr. Goodman
112. Advanced Water-Color Rendering. (1) I and II. Mr. Downs, Mr. Jory  
 Three hours weekly.  
 Prerequisite: course 12 (1 unit with grade A or B).
117. Introduction to Housing and Planning. (3) I and II. Mr. Moïse  
 Prerequisite: senior standing.  
 Occasional seminars and field trips as arranged.

121. Architectural History. (3) I. Mr. Ackerman  
Prerequisite: course 4N for architecture students. No prerequisite for others.  
Survey of Ancient and Medieval periods.  
Students may not receive credit for both course 5A, 5B, and course 121.
122. Architectural History. (3) II. Mr. Ackerman  
Prerequisite: course 4N for architecture students. No prerequisite for others. Course 121 not prerequisite to 122.  
Survey of Renaissance and Modern periods.  
Students may not receive credit for both course 5C, 5D, and course 122.
125. Renaissance and Baroque Architecture. (3) I. Mr. Ackerman  
Prerequisite: courses 121 and 122 or equivalent.  
Detailed investigation of Western European architecture from 1400 to 1800.  
Students may not receive credit for both course 5C, and course 125.
131. Building Materials. (2) I and II. Mr. Simonds  
Structural and aesthetic properties of materials.
- \*140. Sculptural Design: The Statue. (2) II. Mr. Schnier  
(Formerly numbered 113A.)  
Prerequisite: courses 14A-14B, or 142.  
Advanced design featuring three-dimensional sculptural compositions in relation to architecture and the allied arts.
141. Sculptural Design: The Relief. (2) II. Mr. Winter  
(Formerly numbered 113B.)  
Prerequisite: courses 14A-14B, or 142.  
Advanced design featuring relief sculpture in confined and free-outline space in relation to architecture.
142. The Human Figure in Sculpture. (2) I and II.  
(Formerly numbered 114A.) Mr. O'Hanlon, Mr. Schnier, Mr. Winter  
Six hours weekly.  
Prerequisite: courses 14A-14B, or 14A and two art or design courses.  
Design exercises with form, line, and space in three-dimensions and low-relief, featuring the human figure as subject matter.
143. The Human Figure in Sculpture: Advanced Design. (2) II. Mr. Winter  
(Formerly numbered 114B.)  
Six hours weekly.  
Prerequisite: course 142.  
Continuation of course 142 with emphasis on specialized features.
146. Psychology of Artistic Expression. (2) I. Mr. Schnier  
Prerequisite: junior standing.  
Study of mental mechanisms in artistic creativity, including theory of the unconscious, the primary processes, art symbolism and sublimation.
148. Sculpture Methods and Materials. (2) I. Mr. O'Hanlon  
(Formerly numbered 148A.)  
Six hours weekly.  
Prerequisite: course 14A-14B.  
Design exercises featuring the use of sculptural mediums.
149. Sculpture Methods and Materials. (2) II. Mr. O'Hanlon  
(Formerly numbered 148B.)  
Prerequisite: course 14A-14B.  
Design exercises featuring the use of stone, metal, and plaster.

\* Not to be given, 1954-1955.

- †199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Wurster in charge)

## GRADUATE COURSES

(Admission of graduates for work under the graduate division will be restricted to those who, during their junior and senior years, have maintained in all courses, including design, a sufficiently high scholastic average to indicate ability to carry on work satisfactorily at the graduate level. For other conditions concerning admission to graduate courses, see page 10.

200. Comprehensive Graduate Problems. (5) I and II.  
Mr. Jeans, Mr. Simonds  
Twelve hours weekly. A semester problem, including all phases of design, structure, and construction details. Given only in conjunction with course 207.
- 201A. Design and Theory: Graduate Sketch Problems. (1) I and II.  
Prerequisite: course 102A-102B. Mr. Downs, ———
- 201B. Design and Theory: Graduate Problems. (7) I and II. Mr. Downs  
Prerequisite: courses 101A-101B and 102A-102B.
- †202. Design and Theory: Advanced Problems and Research. (6) I and II.  
The Staff (Mr. Wurster in charge)  
Prerequisite: courses 200, 201A-201B, 207.
207. Architectural Engineering. (3) I and II. Mr. Steinbrugge, Mr. Stratta  
This course is coordinated with course 200 and must be taken with it.
208. Seminar in Architecture. (3) I and II. Mr. Wurster  
For candidates for the degree of Master of Arts only.
209. Seminar in Professional Practice. (2) I and II. Mr. Jeans  
Prerequisite: course 200, 207, and graduate standing.  
A course in specification writing, professional practice, and business relations for candidates for the degree of Master of Arts only.
- †298. Special Study for Graduate Students. (2-4) I and II.  
By arrangement only. The Staff (Mr. Wurster in charge)

## REQUIRED COURSES IN OTHER DEPARTMENTS

- General Physics Lectures (Physics 2A-2B).  
General Physics Laboratory (Physics 3A-3B).  
Introduction to Mathematical Analysis (Mathematics 3A, 3B).  
Form (Art 2A).  
Strength of Materials (Engineering 18A, 18B; Civil Engineering 108F).  
Elements of Framed Structures (Civil Engineering 112, 107E, 107F).  
Plane Surveying (Engineering 21).

## ART

(Department Office, 107 Spreckels Art Building)

John C. Haley, *Professor of Art*.

Walter W. Horn, Ph.D., *Professor of Art (Acting Chairman of the Department for the fall semester)*.

<sup>1</sup> J. Ward Lockwood, *Professor of Art*.

<sup>2</sup> Erle Loran, *Professor of Art (Chairman of the Department)*.

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

<sup>1</sup> In residence fall semester only, 1954-1955.

<sup>2</sup> In residence spring semester only, 1954-1955.

- <sup>3</sup> Otto J. Maenchen, Ph.D., *Professor of Art.*  
 Stephen C. Pepper, Ph.D., L.H.D., *Mills Professor of Intellectual and Moral Philosophy and Civil Polity.*  
 Glenn Wessels, M.A., *Professor of Art.*  
 Eugen Neuhaus, Ph.D. (hon.c.), *Professor of Art, Emeritus.*  
 Worth Ryder, *Professor of Art, Emeritus.*  
 Oliver M. Washburn, A.B., *Professor of the History of Art, Emeritus.*  
 Chiura Obata, *Associate Professor of Art, Emeritus.*  
 Darrell A. Amyx, Ph.D., *Associate Professor of Art and Associate Curator of Ancient Mediterranean Art, Museum of Anthropology.*  
 James McCray, M.A., *Associate Professor of Art.*  
 \* Kyle Morris, M.F.A., *Associate Professor of Art.*  
 Felix Ruvolo, *Associate Professor of Art.*  
 James S. Ackerman, Ph.D., *Assistant Professor of Art and Architecture.*  
 Herschel B. Chipp, M.A., *Acting Assistant Professor of Art.*  
 Karl Kasten, M.A., *Assistant Professor of Art.*



Alfred Frankenstein, Ph.B., *Lecturer in Art for the spring semester.*  
 Esteban Vicente, A.B., *Visiting Associate Professor of Art.*

*Letters and Science List.*—All undergraduate courses in art are included in the Letters and Science List of Courses. For further information concerning this list, see page 7.

*Departmental Major Advisers:* Appreciation and Practice of Art: Mr. Lockwood, Mr. Wessels; History of Art: Mr. Ackerman.

*Preparation for the Major.*—Six units chosen from courses 1A, 1B, 1C, and 1D; and courses 2A-2B, 3A-3B. These requirements apply both to majors emphasizing Appreciation and Practice of Art and to majors emphasizing History of Art. Recommended for prospective majors in Practice of Art: Architecture 14A-14B. Recommended for prospective majors in History of Art: History 4A-4B.

*The Major.*—A student may elect a major emphasizing Appreciation and Practice of Art or emphasizing History of Art. Major students are required to consult with their major advisers regarding their programs before registering.

The department will recommend for graduation only students with at least a C average. Students who fail to maintain at least a C average may be asked to drop the major at any time.

I. Appreciation and Practice of Art. Required: 12 units of group A courses under three different artists (2 units of Architecture 142 or 143 will be accepted for the major), 2 units of Group B, 4 units of Group C, and 6 units chosen from Group A, B, or C.

II. History of Art. Required: 12 units of Group C of which 6 units must be in an historical sequence, such as 154A-154B; Philosophy 136A; and 9 additional units of any courses in Group A, B, or C. With approval, substitutions may be made within these 9 units of certain courses offered in other departments. Students planning to do advanced work in History of Art are urged to develop their knowledge of foreign languages (especially French and German) as early as possible.

*Assignment to Sections.*—Inasmuch as space and facilities for technical courses are limited, students are advised to enroll in all Group A courses dur-

\* Absent on leave, 1954-1955.

<sup>2</sup> In residence spring semester only, 1954-1955.

ing the days of registration to be announced on placards on bulletin boards. Preference is given to first applicants.

*Transfer Students.*—Transfer students who have fulfilled unit requirements elsewhere are: (a) required to take an examination in order to qualify for Group A courses, and (b) are requested to present examples of their work done in other institutions before being admitted to classes and before credit can be given toward the major for work done elsewhere.

Students who qualify will be advised to take course 195 in order to acquaint themselves with the methods expected for this department's advanced courses.

#### LOWER DIVISION COURSES

- 1A. History of Ancient Mediterranean Art. (3) I. Mr. Amyx  
Lectures and weekly section meetings to be arranged.  
From the Stone Age to the end of the Roman Empire.  
Prerequisite for all upper division courses in ancient art.
- 1B. History of Medieval, Renaissance, and Modern Art—Emphasis on Painting. (3) II. Mr. Ryder  
Lectures and biweekly section meetings to be arranged.
- 1C. History of Medieval, Renaissance, and Modern Art—Emphasis on Architecture and Sculpture. (3) I. Mr. Horn  
Lectures and weekly section meetings to be arranged.
- 1D. History of Oriental Art. (3) II. Mr. Maenchen  
Lectures and weekly section meetings to be arranged.  
The art of India, China, and Japan.
- 2A–2B. Elementary Form and Color. (2–2) Yr. Beginning each semester.  
Mr. Haley, Mr. Kasten, Mr. Lockwood, Mr. Loran, Mr. McCray,  
Mr. Vicente, Mr. Ruvolo, Mr. Ryder, Mr. Wessels  
2A: Form in composition using black and white media.  
2B: Introduction to color in composition.
- 3A–3B. Intermediate Form and Color. (2–2) Yr. Beginning each semester.  
Mr. Haley, Mr. McCray, Mr. Ruvolo, Mr. Wessels  
Prerequisite: course 2A–2B.  
3A: Color and form in composition.  
3B: Form in composition using the human figure as subject.
10. An Introduction to Art. (2) I. Mr. McCray  
Lectures, illustrated with lantern slides.  
The understanding and appreciation of painting, sculpture, architecture, and industrial art. Open to non-majors.

#### UPPER DIVISION COURSES

##### Group A: Appreciation and Practice

Prerequisite: courses 2A–2B, 3A–3B.

The various courses in Group A differ in content, use of materials, type of subject matter, etc., depending upon the individual aims of the artists in charge. All courses in this group may be repeated indefinitely without duplication of credit, and part A is not prerequisite to part B.

The subject matter will range from still life and landscape to life classes, figure and mural compositions.

The materials used will range from charcoal and *sumi* to water color, gouache, egg tempera, oil, mixed technique, and fresco painting.



100. Materials of Painting. (2) I. Mr. Kasten  
A study of the means of expression.
102. Advanced Drawing and Painting. (2) I. Mr. Ryder  
Composition with the human figure as a basic motif. Drawings in charcoal and pencil. Paintings in tempera, gouache, and wax.
- 103A-\*103B. Advanced Drawing and Painting. (2-2) Yr. Mr. Lockwood  
Course 103A is not prerequisite to 103B.
- 104A-104B. Advanced Drawing and Painting. (2-2) Yr. Mr. Haley  
Course 104A is not prerequisite to 104B.
- 105A-\*105B. Advanced Drawing and Painting. (2-2) Yr. Mr. Loran  
105A: II.  
Course 105A is not prerequisite to 105B.
- 106A-106B. Advanced Drawing and Painting. (2-2) Yr. Mr. McCray  
Course 106A is not prerequisite to 106B.
- 108A-\*108B. Advanced Drawing and Painting. (2-2) Yr. Mr. Kasten  
108A: II.  
Course 108A is not prerequisite to 108B.
- 109A-109B. Advanced Drawing and Painting. (2-2) Yr. Mr. Ruvolo  
109A: I, II, 109B: I.  
Course 109A is not prerequisite to 109B.
- \*110A-110B. Advanced Drawing and Painting. (2-2) Yr. \_\_\_\_\_  
Course 110A is not prerequisite to 110B.
- 111A-111B. Advanced Drawing and Painting. (2-2) Yr. Mr. Vicente  
Course 111A is not prerequisite to 111B.
- 113A-113B. Advanced Drawing and Painting. (2-2) Yr. Mr. Wessels  
Course 113A is not prerequisite to 113B.
129. Practice in the Graphic Arts. (2) II. Mr. Kasten

**Group B: Theory and Criticism**

- \*107. The Human Figure in Art, Past and Present. (2) I. Mr. Ryder  
Prerequisite: course 3A-3B.  
The use of the human figure in art, past and present. Problems of light, color, and space involving the figure and its environment.
- \*132. History and Theory of Art Criticism. (2) II. Mr. Wessels  
Prerequisite: upper division standing, course 1B, and one upper division painting course.  
Study of the relation between artist and critic in the visual arts, with some practical experience in criticism.
173. The Architecture of Paintings. (2) I. Mr. Ryder  
Prerequisite: course 2A-2B.  
Enrollment limited to fifty.

\* Not to be given, 1954-1955

Aesthetics. (Philosophy 136A-136B.) (3-3) Yr.

Mr. Pepper, Mr. Aschenbrenner  
Prerequisite: 6 units of philosophy (at the discretion of the instructor these may be waived for students majoring in literature and the fine arts).

**Group C: History of Art and Archaeology**

140. The Art of Primitive Peoples. (3) II.

Mr. Chipp

An analysis of style and an aesthetic evaluation of forms in the art of several primitive cultures, developed according to art-historical principles. Special consideration is given to an integration of the art with the cultural background.

\*153. Aegean Art. (2) I.

Mr. Amyx

The art of Crete and Greece in the Bronze Age, with attention to connections with neighboring cultures.

154A-154B. Greek Art. (3-3) Yr.

Mr. Amyx

From the Geometric Period to the beginning of the Roman Empire.

154A. From 1100 to 450 B.C.

154B. From 450 to 30 B.C.

Either half of the course may be taken separately.

159. Roman Art. (3) II.

Mr. Amyx

The art of Italy and the Roman Empire from the Early Iron Age to the period of Constantine.

\*160A-160B. History of Early Chinese Art. (2-2) Yr.

Mr. Maenchen

Prerequisite: upper division standing and course 1D or consent of instructor.

From Shang to T'ang.

\*161A-161B. History of Later Chinese Art. (2-2) Yr.

Mr. Maenchen

Prerequisite: upper division standing and course 1D or consent of instructor.

From Sung to Ch'ing.

162. The Art of Japan. (3) II.

Mr. Maenchen

Prerequisite: upper division standing and course 1D or consent of instructor.

From prehistoric times to Hokusai.

\*163. The Art of India. (3) II.

Mr. Maenchen

Prerequisite: upper division standing.

169. History of American Art. (3) II.

Mr. Frankenstein

Prerequisite: upper division standing.

175A-\*175B-\*175C. Medieval Art. (3-3-3)

Mr. Horn

One part is not prerequisite to another.

175A. Early Christian and Byzantine Art. II.

Mediterranean roots of medieval art.

\*175B. Germanic and Celtic Art. II.

Northern roots of medieval art.

\*175C. Medieval Art. II.

Carolingian renaissance to the end of the thirteenth century.

\* Not to be given, 1954-1955.

- 176A-176B. Italian Renaissance Art. (3-3 Yr. Mr. Ackerman  
 176A is not prerequisite to 176B.  
 176A. Italian Art of the Fifteenth Century.  
 176B. Italian Art of the Sixteenth Century.
- \*178. Baroque Art. (3) II. Mr. Ackerman
- \*180. French Art from 1400 to 1800. (3) I. Mr. Ackerman
- 183A-183B. Modern Art—Emphasis on Painting. (3-3) Yr. Mr. Chipp  
 183A is not prerequisite to 183B.  
 183A. Art of the Nineteenth Century.  
 183B. Art of the Twentieth Century.

## SPECIAL STUDY COURSES

- \*190. Proseminar in Medieval Art. (2) II. Mr. Horn
193. Proseminar in the Art of Primitive Peoples. (2) I. Mr. Chipp  
 Prerequisite: course 140 or equivalent, and consent of instructor.
195. Special Study in Practice of Art. (2) I and II. Mr. Loran, Mr. Haley  
 Prerequisite: 8 units of practice work, or equivalent, taken at another university. Restricted to art majors. May not be repeated for credit.
199. Special Study for Advanced Undergraduates. (1-4) I and II.  
 The Staff (Mr. Lockwood in charge)  
 Prerequisite: senior standing in art, with at least a B average in the major, and approval of the department. Credit gained in course 199 will be accepted in fulfillment of requirements in Groups A, B, or C.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Advanced Study and Practice in a Selected Technique. (3) I and II.  
 Mr. Vicente, Mr. Haley
254. Seminar in the History of Ancient Art. (2) I and II. Mr. Amyx  
 This course may be repeated for credit.
- 269A-269B. Seminar in Art. (3-3) Yr.  
 Mr. Kasten, Mr. Lockwood, Mr. McCray, Mr. Ruvolo  
 269A: Mr. Kasten, Mr. Lockwood.  
 269B: Mr. McCray, Mr. Ruvolo.  
 Two hours weekly to be arranged.  
 Prerequisite: at least a B average in the undergraduate major in art. Applicants must also demonstrate ability in composition in an examination which will be set at the opening of the semester. If necessary, 269B may precede 269A.
277. Seminar in the History of Renaissance Art. (2) II. Mr. Ackerman  
 This course may be repeated for credit.
283. Seminar in the History of Modern Art. (2) I and II. Mr. Chipp  
 This course may be repeated for credit.
285. Seminar in the History of Early Christian and Medieval Art. (2) I and II.  
 Mr. Horn  
 This course may be repeated for credit.

\* Not to be given, 1954-1955.

287. Seminar in the History of Oriental Art. (2) II. Mr. Maenchen  
This course may be repeated for credit.

298. Special Study for Graduate Students. (1-6) I and II.  
The Staff (Mr. McCray in charge)  
Prerequisite: at least a B average in the upper division and graduate courses taken in the Department of Art. A student may not register with more than two instructors in any one semester for credit.

299. Special Study for Graduate Students in the History of Art. (1-4)  
I and II. The Staff (Mr. Amyx in charge)

#### RELATED COURSES IN OTHER DEPARTMENTS

Architectural History (Architecture 121, 122).  
Renaissance and Baroque Architecture (Architecture 125).  
Classical Archaeology: Vase Painting (Classics 170A-170B-170C).  
Advanced Course in Archaeological Method (Classics 271A-271B).  
Primitive Art (Decorative Art 127A-127B-127C).

#### UNIVERSITY ART GALLERY

The University Art Gallery was established in 1933 with funds contributed for the purpose by the Class of 1933, the Regents of the University, Albert M. Bender, and other generous friends and alumni of the University. Owing to limitations of space and facilities, the Gallery does not maintain a permanently installed exhibition, but presents from time to time temporarily installed exhibits covering various phases of art. The material comprising these exhibits is drawn either from University collections in storage, or borrowed from other institutions and organizations, or from private individuals. Those interested in the Gallery's activities may address the Director, Mr. Winfield S. Wellington.

## ASTRONOMY

(Department Office, 3 Leuschner Observatory)

Otto Struve, Ph.D., Sc.D., *Professor of Astronomy and Director of the Leuschner Observatory (Chairman of the Department)*.

R. Tracy Crawford, Ph.D., *Professor of Astronomy, Emeritus, and Director of the Leuschner Observatory, Emeritus*.

Sturla Einarsson, Ph.D., *Professor of Astronomy, Emeritus, and Director of the Leuschner Observatory, Emeritus*.

Robert J. Trumpler, Ph.D., *Professor of Astronomy, Emeritus*.

Leland E. Cunningham, Ph.D., *Associate Professor of Astronomy*.

Louis G. Henyey, Ph.D., *Associate Professor of Astronomy*.

Harold F. Weaver, Ph.D., *Associate Professor of Astronomy*.

John G. Phillips, Ph.D., *Assistant Professor of Astronomy*.

Delbert H. McNamara, Ph.D., *Associate in Astronomy*.

Helen Pillans, Ph.D., *Associate in Astronomy*.



Ronald N. Bracewell, Ph.D., *Visiting Assistant Professor of Astronomy*.

C. Donald Shane, Ph.D., *Director of the Lick Observatory and Astronomer*.

*Letters and Science List.*—All undergraduate courses in astronomy except 3 and 11 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Struve, Mr. Weaver.

*Preparation for the major:* Physics 4A-4B-4C or equivalents; Mathematics 3A-3B, 4A-4B, or equivalents, and a course in statistics; Astronomy 7A-7B; a reading knowledge of French, German, or Russian.

*The Major:* The major consists of a minimum of 24 units of upper division work in astronomy and allied subjects taken in accordance with a plan approved by the major adviser. Normally, students majoring in astronomy must take courses 104A-104B, 105A-105B, and 117A-117B.

*Honors in Astronomy.*—Honors are recommended on the basis of excellence of work in the major.

#### LOWER DIVISION COURSES

1. Introduction to Astronomy. (3) I and II. Mr. Struve, Miss Pillans  
General facts and principles of the science of astronomy.  
Students who have completed course 1A may not receive full credit for course 1.  
Three lectures and one discussion section weekly.
2. Practice in Observing. (2) I and II. Miss Pillans  
One lecture and three observing hours to be arranged.  
Prerequisite: course 1 and plane trigonometry.  
Elementary work with the equatorial telescope, transit, and sextant; elementary determinations of time, latitude, and longitude, constellation study. Enrollment limited to sixteen students.
- 7A-7B. General Astronomy. (3-3) Yr. Mr. Phillips  
A three-hour laboratory or observing period will be substituted occasionally for one of the lectures.  
Prerequisite: Mathematics 3A.  
The facts and principles underlying all branches of astronomy. Intended for majors in the natural sciences and engineering. Required in preparation for a major in astronomy.

#### UPPER DIVISION COURSES

- 104A-104B. Practical Astronomy. (3-3) Yr. Mr. McNamara  
Prerequisite: Mathematics 3A-3B, Physics 4A-4B, and either course 1 or 7A-7B. Course 105A-105B is recommended and may be taken concurrently.  
104A. Precise determination of latitude, time and longitude. Precession, nutation, proper motion and refraction.  
104B. Optical properties of a telescope. Differential measurement of star positions.
- 105A-105B. Theory and Practice of Computing. (3-3) Yr. Mr. Cunningham  
Prerequisite: a working knowledge of differential and integral calculus. Interpolation, numerical differentiation, and integration. Solution of equations. Least squares. Astronomical problems.
- 117A-117B. Introduction to Astrophysics. (3-3) Yr. Mr. Weaver  
A laboratory period will occasionally be substituted for one of the regular periods.  
Prerequisite: consent of instructor.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
The Staff (Mr. Weaver in charge)

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- \*205. Utilization of Modern Computing Machinery. (3) I. Mr. Cunningham  
Prerequisite: course 105A-105B or equivalent.  
Theory and practice of the solution of large astronomical problems with punch-card and electronic calculators.
- 207A-207B. Physical Foundations of Astrophysics. (4-4) Yr. Mr. Henyey  
Prerequisite: Mathematics 110A-110B, Physics 121 or equivalent.  
A discussion of the physical foundations of modern astrophysics, with emphasis on those topics bearing directly on astrophysical theories.
- \*215A-215B. Orbit Theory and Practice. (3-3) Yr. Mr. Cunningham  
Prerequisite: course 105A-105B or equivalent.  
Various orbit methods. Special perturbations. Introduction to general perturbations.
- \*217A-217B. Astrophysics. (3-3) Yr. Mr. Henyey  
Prerequisite: course 117A-117B.  
The physics of stellar atmospheres.
- 218A-218B. Statistical Astronomy. (3-3) Yr. Mr. Weaver  
An introduction to the principal problems of galactic structure.
- 220A-220B. Radio Astronomy. (3-3) Yr. Mr. Bracewell  
Prerequisite: consent of instructor.  
Technique, basic theory, sun, galaxy, terrestrial atmosphere, meteor radar, lunar radiation, and lunar radar.
- 225A-225B. Celestial Mechanics. (3-3) Yr. Mr. Cunningham  
Prerequisite: Physics 105.
- 227A-227B. Stellar Structure. (3-3) Yr. Mr. Henyey  
Prerequisite: course 117A-117B and 207A-207B, or their equivalent.  
The physics of the stellar interior, energy sources, stellar rotation, and pulsation.
- \*237A-237B. Astronomical Spectroscopy. (3-3) Yr. Mr. Phillips  
Prerequisite: Physics 211A or equivalent.  
The application of the principles of atomic and molecular spectroscopy to the study of the spectra of astronomical sources.
- 247A-247B. Advanced Astronomical Spectroscopy. (3-3) Yr. Mr. Phillips  
Prerequisite: Physics 211A or equivalent.  
Advanced topics in astronomical spectroscopy: spectra of Wolf-Rayet stars, novae, Cepheid variables, spectrum variables, late-type stars, comets, planets, night sky, interstellar matter.
291. Proseminar. (1-3) II. Mr. Weaver  
Introduction to research. For new graduate students in Astronomy.
292. Astrophysics Seminar. (1-3) I and II. Mr. Struve, Mr. Henyey, Mr. Phillips
- †293. Seminar in Orbits. (1-3) I and II. Mr. Cunningham
- \*294. Seminar in Statistical Astronomy. (1-3) I. Mr. Weaver

\* Not to be given, 1954-1955.

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

298. Advanced Study and Research at Lick Observatory. (1-4) I and II.

The Staff (Mr. Shane in charge)

Intended for graduate students who require observational experience as well as for those working upon observational problems for their theses.

299. Advanced Study and Research. (1-4) I and II.

The Staff (Mr. Struve in charge)

#### LICK OBSERVATORY

The Lick Observatory at Mount Hamilton is a separate research department of the University and provides facilities for advanced astronomical work. Graduate students of superior ability are offered the opportunity to work at the Observatory under the direction of the astronomers. In the course of such work, a student may prepare the material for a doctor's or a master's dissertation. For information relating to opportunities for work at the Observatory, interested students should address the Dean of the Graduate Division at Berkeley, or the Director of the Lick Observatory, Mount Hamilton, Santa Clara County, California.

### BACTERIOLOGY

(Department Office, 3531 Life Sciences Building)

Michael Doudoroff, Ph.D., *Professor of Bacteriology.*

Sanford S. Elberg, Ph.D., *Professor of Bacteriology (Chairman of the Department).*

Albert P. Krueger, A.B., M.D., *Professor of Bacteriology and Lecturer in Medicine.*

John H. Northrop, Ph.D., Sc.D., LL.D. (*Member of the Rockefeller Institute for Medical Research*), *Professor of Bacteriology.*

Roger Y. Stanier, Ph.D., *Professor of Bacteriology.*

Jacob Fong, Ph.D., *Associate Professor of Bacteriology.*

Edward A. Adelberg, Ph.D., *Assistant Professor of Bacteriology (Vice-Chairman of the Department).*

Barbara Beam, Ph.D., *Associate in Bacteriology.*

Aileen E. Bonestell, M.A., *Associate in Bacteriology.*



Horace A. Barker, Ph.D., *Professor of Plant Biochemistry.*

Edwin H. Lennette, M.D., Ph.D., *Lecturer in Bacteriology for the spring semester.*

Stewart H. Madin, D.V.M., *Lecturer in Bacteriology.*

Ralph Muckenfuss, M.D., *Lecturer in Bacteriology.*

Gunther S. Stent, Ph.D., *Lecturer in Bacteriology.*

*Letters and Science List.*—All undergraduate courses in bacteriology are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Doudoroff.

Students in the lower division are urged to consult with the major adviser concerning the specific prerequisites to be taken in the lower division as a basis for a major in bacteriology.

*Preparation for the Major.*—Required: course 1 (normally taken in the junior year). In special cases and with prior approval of the adviser, course 2 will be accepted as a substitute, provided this is passed with a grade of B and

either course 104 or courses 103 and 107 are included in the major program; Chemistry 1A, 1B, 5; 8 or 12; Zoölogy 1A or Botany 1; Physics 2A, 2B. Recommended for those planning to go on to graduate work: elementary courses in French and German; Botany 1 and 14; Chemistry 9, and additional courses in both Botany and Zoölogy.

*The Major.*—All courses in the department must be completed with at least a grade of C, and a grade-point average of 1.0 must be maintained in all courses acceptable for the major. Required: courses 101, and at least 4 units of other upper division courses in the department; Biochemistry 102, or 100A–100B; Biochemistry 101A or Plant Biochemistry 123 and the balance of 24 units required for the major chosen from any of the following: courses 102, 103, 104, 106, 106C, 107, 199; Botany 101, 102; Chemistry 100, 102, 103, 109; Biochemistry 101B, 107; Zoölogy 101, 101C, 102, 102C, 107, 110, 114 (or 115); Anatomy 101; Entomology 126, 117 (or Zoölogy 111); Public Health 150A, 150B.

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

#### LOWER DIVISION COURSES

##### 1. Introductory Bacteriology and Microbiology. (5) I.

Lectures and laboratory.

Mr. Doudoroff, Mr. Stanier

Prerequisite: Chemistry 1A and 8; a semester course in botany, zoölogy, or physiology (Botany 1 or 12; Zoölogy 1A or 10; Physiology 1) with at least a grade of C in each course.

A general introduction to microbiology required of students majoring in bacteriology and other students intending to do further work in microbiology. This course is designed also for students in soil microbiology, food technology, biochemistry and related fields.

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

Mr. Adelberg

Lectures and laboratory.

Prerequisite: Chemistry 1A.

Designed especially for students who are not majoring in bacteriology.

#### UPPER DIVISION COURSES

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

##### 101. Advanced Bacteriology. (6) I. Mr. Elberg, Mr. Fong, Mr. Muckenfuss

Lectures, demonstrations, and laboratory.

Prerequisite: course 1 or 2, Chemistry 8, Zoölogy 1A.

A course designed to acquaint the student with principles and laboratory procedures necessary for studying the pathogenesis of bacterial and other microbial infections of man.

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

Prerequisite: course 101, Chemistry 8.

Mr. Elberg

The factors underlying the virulence of microörganisms; mechanisms of bacterial infection; specific and nonspecific reactions in antimicrobial immunity; the antigen-antibody reaction; nature and serological specificity of antibodies; immuno-chemistry of protein and nonprotein cell substances.

##### 103. Microbial Metabolism. (2) II.

Mr. Barker, Mr. Doudoroff, Mr. Adelberg, Mr. Stanier

Prerequisite: course 1 or 2 and Biochemistry 102 or equivalent (Biochemistry 103, Botany 122).



104. Advanced General Microbiology. (4) I. Mr. Stanier, Mr. Doudoroff  
Prerequisite: course 1 and Biochemistry 102.  
A course designed primarily to acquaint the student with the laboratory techniques necessary for advanced work in general microbiology. Enrollment limited to eight students selected by instructors.
106. Introduction to the Animal Viruses. (2) II. Mr. Fong, Mr. Lennette  
Prerequisite: course 101 with a grade of C or better.  
An introduction to the animal viruses including the techniques of virology, inclusion bodies, pathogenesis, immunity and virus-host relationship.
- 106C. Laboratory in Virology. (2) II. Mr. Fong  
Prerequisite: course 106, completed or in progress, and consent of instructor.  
A basic course in laboratory techniques for isolation, cultivation and identification of animal and bacterial viruses. Application of these procedures in diagnosis, immunology and pathogenesis of viral diseases. Studies on the nature and reproduction of viruses and the host-virus relationships.
107. Microbial Genetics. (2) II. Mr. Adelberg, Mr. Stent  
Prerequisite: any elementary course in bacteriology (Bacteriology 1 or 2 or equivalent) or consent of instructor.  
An introduction to principles and techniques concerned in the genetics of microorganisms.
- 199A-199B. Special Study for Advanced Undergraduates. (2-2) Yr. Beginning each semester. The Staff (Mr. Krueger in charge)  
199A is not a prerequisite to 199B.  
Study of the recent literature and preparation of a term paper.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Special Study and Research. I and II. The Staff (Mr. Krueger in charge)  
Credit according to the work completed.
202. Seminar in Current Research. (1) I and II. The Staff (Mr. Elberg in charge, fall semester; Mr. Stanier in charge, spring semester)  
Prerequisite: consent of instructor.  
Presentation of current research projects.
203. Seminar on Microbiological Metabolism. (1) II. Mr. Stanier
204. Seminar in Medical Microbiology. (1) I. Mr. Fong
205. Seminar in Immunology. (1) II. Mr. Elberg
- 206A-206B. Experimental Pathology. (3-3) Yr. Mr. Krueger, Mr. Madin  
A study of host reaction to injury.

**BIOCHEMISTRY****Department of Biochemistry of the College of Letters and Science**

(Department Office, 229 Biochemistry and Virus Laboratory)

Hermann O. L. Fischer, Ph.D., *Professor of Biochemistry (Chairman of the Department)*.

Paul L. Kirk, Ph.D., *Professor of Biochemistry and Professor of Criminalistics.*

- Choh H. Li, Ph.D., *Professor of Biochemistry.*  
 Wendell M. Stanley, Ph.D., Sc.D., LL.D., Docteur h.c. (Paris), *Professor of Biochemistry and Physiological Chemistry and Director of the Virus Laboratory.*  
 Robley C. Williams, Ph.D., *Professor of Biophysics.*  
 C. Arthur Knight, Ph.D., *Associate Professor of Biochemistry.*  
 Frederick H. Carpenter, Ph.D., *Assistant Professor of Biochemistry (Vice-Chairman of the Department).*  
 Charles A. Dekker, Ph.D., *Assistant Professor of Biochemistry.*  
 Donald L. MacDonald, Ph.D., *Assistant Professor of Biochemistry.*  
 Arthur B. Pardee, Ph.D., *Assistant Professor of Biochemistry.*  
 Howard K. Schachman, Ph.D., *Assistant Professor of Biochemistry.*  
 Robert W. Cowgill, Ph.D., *Instructor in Biochemistry.*



- Hamilton H. Anderson, M.D., *Professor of Pharmacology.*  
 Melvin Calvin, Ph.D., *Professor of Chemistry.*

### **Department of Plant Biochemistry of the College of Agriculture**

(Department Office, 337 Biochemistry and Virus Laboratory)

- Horace A. Barker, Ph.D., *Professor of Plant Biochemistry.*  
 William Z. Hassid, Ph.D., *Professor of Plant Biochemistry.*  
 Walton B. Sinclair, Ph.D., *Professor of Biochemistry, Riverside.*  
 \*Paul K. Stumpf, Ph.D., *Associate Professor of Plant Biochemistry (Chairman of the Department).*  
 Constant C. Delwiche, Ph.D., *Assistant Professor of Plant Biochemistry.*



- Eric E. Conn, Ph.D., *Lecturer in Plant Biochemistry.*  
 Michael Doudoroff, Ph.D., *Professor of Bacteriology.*  
 Roger Y. Stanier, Ph.D., *Professor of Bacteriology.*

### **Department of Physiological Chemistry of the School of Medicine**

(Department Office, 1557 Life Sciences Building)

- Frank W. Allen, Ph.D., *Professor of Physiological Chemistry (Vice-Chairman of the Department).*  
 David M. Greenberg, Ph.D., *Professor of Physiological Chemistry (Chairman of the Department).*  
 Edward S. Sundstroem, M.D., *Professor of Physiological Chemistry, Emeritus.*  
 Harold Tarver, Ph.D., *Associate Professor of Physiological Chemistry.*  
 Edward L. Duggan, Ph.D., *Assistant Professor of Physiological Chemistry.*  
 Richard A. Feinberg, M.D., Ph.D., *Assistant Professor of Physiological Chemistry.*

*Letters and Science List.*—All undergraduate courses in biochemistry are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers.*—Mr. Dekker, Mr. Cowgill.

*Preparation for the Major.*—The department offers two programs for the major: Plan I, a program for students expecting to pursue graduate study in

\* Absent on leave, 1954-1955.

biochemistry, and Plan II, a program with emphasis on biochemical laboratory techniques for students who do not expect to continue beyond the Bachelor of Arts degree. Any student who has completed Biochemistry 102 and wishes to become a biochemistry major should consult a biochemistry major adviser regarding an acceptable program.

*Plan I.*—Required: Chemistry 1A-1B, 5, 12, either 112 or 112C, and 109 or preferably 110A-110B (112C and 109 or 110A may be taken concurrently with Biochemistry 100A); Mathematics 3A-3B, 4A; Physics 4A, 4B, 4C; Physiology 1-1L or Zoölogy 1A and one of the following: Bacteriology 1 or 2, Botany 1 or 12, Zoölogy 1B. Recommended: a course in statistics; a reading knowledge of German and one other foreign language.

*Plan II.*—Required: Chemistry 1A-1B, 5, 8, 9, 109; Mathematics 3A-3B or 16A-16B; Physics 2A-2B, 3A-3B; Physiology 1-1L or Zoölogy 1A and one of the following: Bacteriology 1 or 2, Botany 1 or 12, Zoölogy 1B.

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. Ordinarily a grade-point average of at least 1.0 in courses taken in preparation for the major is required for admission to the major.

*The Major.—Plan I.* The major must include courses 100A-100B (3-3), 101A-101B (3-3), 112 (1) and the balance of the 24 units required for the major chosen from other courses in biochemistry and in allied subjects in accordance with a plan approved by the departmental adviser. Students planning to pursue graduate study in biochemistry should maintain a grade-point average of at least 2.0 in biochemistry courses. The department will certify to the completion of the major program for graduation under Plan I only on the basis of a grade-point average of at least 1.0 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 biochemistry.

*Plan II.*—The major must include courses 100A-100B (3-3), 101A-101B (3-3), 112 (1), and a minimum of 3 units selected from the following courses: Biochemistry 107, 110, 180, Bacteriology 103, Zoölogy 101-102 or other courses in biochemistry with the consent of the departmental adviser. The balance of the 24 units of upper division work will consist of courses in biochemistry and allied subjects (see list, page 47). The department will certify to the completion of the major program for graduation under Plan II only on the basis of a grade-point average of at least 1.0 in the upper division courses included in the major. Students who cannot maintain such an average may be required at any time to withdraw from the major in biochemistry.

A major in basic chemistry with emphasis on biochemistry may be taken in the College of Chemistry since course 100A-100B (3-3) is accepted as a chemistry course in the basic chemistry major.

*Honors in Biochemistry.*—Honors are recommended for students who maintain a grade-point average of 2.0 or higher. Honor students are given greater opportunity to choose courses and work within courses in the manner best suited to individual needs.

## BIOCHEMISTRY

### UPPER DIVISION COURSES

100A-100B. General Biochemistry. (3-3) Yr.

Mr. Carpenter

Prerequisite: Chemistry 8 and 9 or 12 with a grade of C or higher; Chemistry 109 or 110A (may be taken concurrently), and Physiology 1-1L or Zoölogy 1A (may be taken concurrently), or consent of instructor.

Lectures on the chemical and physical factors concerned in life processes including the chemistry and metabolism of salts, vitamins, hormones, lipids, carbohydrates, and proteins with a survey of nutrition and energy exchange. Designed for biochemistry majors.

- 101A-101B. General Biochemistry Laboratory. (3-3) Yr. Mr. Dekker  
(Formerly numbered 104.)  
One lecture and two three-hour laboratory periods weekly.  
Prerequisite: course 100A or 102 (may be taken concurrently).  
Laboratory practice with the more important constituents of living matter to illustrate their chemical behavior. The experimental work is planned to accompany the lectures in course 100A-100B.
102. A Brief Survey of the Principles of Biochemistry. (3) I and II.  
Mr. MacDonald, Mr. Conn, Mr. Neilands  
I. Mr. MacDonald and Mr. Conn; II. Mr. MacDonald and Mr. Neilands.  
Prerequisite: Chemistry 8. Recommended: Chemistry 9, 109 and an introductory course in bacteriology, botany, or zoölogy.  
A survey of the chemistry of biologically important compounds and their role in animal and plant metabolism with emphasis on plant metabolism in the fall semester and on animal metabolism in the spring semester. Designed for non-biochemistry majors. Not open for credit to students who have credit in course 100A-100B or its equivalent.
107. Quantitative Microchemical Analysis. (4) I. Mr. Kirk  
One lecture and three three-hour laboratory periods weekly.  
Prerequisite: Chemistry 5, 8, and 9, with a grade of C or higher and consent of instructor. Enrollment limited to twenty-five.  
Quantitative estimation of elements and compounds on a micro basis with particular reference to biological materials.
109. Advanced Microchemical Analysis. (2-4) I and II. Mr. Kirk  
Lecture and laboratory.  
Prerequisite: course 107 with a grade of B or higher, or consent of instructor.  
A limited number of students may pursue advanced microchemical techniques and special problems.
112. Proseminar. (1) II. The Staff (Mr. Li in charge)  
Prerequisite: courses 100A and 101A.  
Biochemical literature and newer developments of the subject.
180. Research. (3-5) I and II. The Staff (Mr. Dekker in charge)  
Prerequisite: courses 100A and 101A or 101M with a grade of B or higher.  
A limited number of advanced students will be given topics for investigation under the direction of a member of the staff.
199. Special Study for Advanced Undergraduates. (1-2) I and II.  
The Staff (Mr. Dekker in charge)  
Reading and conference for properly qualified students under the direction of a member of the staff.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Courses 201 to 212 and 222 represent selected topics in biochemistry and are intended to acquaint advanced students with recent advances made in the different fields of biochemistry. Also open to senior students with honor standing by consent of the instructor.

202. Carbohydrates. (2) I. Mr. Fischer  
Chemistry and biochemistry of the carbohydrates.

203. Biochemistry of the Hormones. (2) II. Mr. Li  
Survey of the biochemistry of the hormones.
- \*204. Biochemistry of the Viruses. (2) II. Mr. Knight  
Survey of the biochemistry of the viruses.
- 206A-206B. Physical Biochemistry. (2-2) Yr. Mr. Schachman, Mr. Williams  
206A. Mr. Williams; 206B. Mr. Schachman.  
Prerequisite: Chemistry 12 or 112 or 112C, 110A-110B, Physics 4A, 4B, 4C, Mathematics 4A or consent of instructor. Recommended: course 102 or 100A-100B.  
Application of modern physical concepts and experimental methods to the problems of large molecules of biological interest.
207. The Mechanism of Drug Action. (2) I. Mr. Anderson  
The composition, synthesis, biochemical and pharmacological properties and action of chemical agents that are used in medicine; relation between chemical composition and pharmacological action; principles of chemotherapy.
208. The Mechanism of Drug Action Laboratory. (1) I. Mr. Anderson  
Prerequisite: course 207 or an equivalent course in pharmacology.  
Intended to serve as an introduction to research in the borderline field between biochemistry and pharmacology.
209. Advanced Biochemical Laboratory Methods. (4) II. Mr. Cowgill  
One lecture and three three-hour laboratory periods weekly.  
Prerequisite: courses 100A-100B, 101A-101B, or their equivalent, and consent of instructor.  
Experimental techniques used in research including purification of natural materials, chromatographic analysis and isotopic tracer methods.
- \*210. Fats, Phospholipids, and Related Compounds. (2) I. Mr. Fischer  
Chemical constitution, isolation, synthesis, stereochemistry, relation to carbohydrates and the general biological role of these compounds.
211. Enzyme Chemistry. (3) I. \_\_\_\_\_  
Prerequisite: course 102 or 100A-100B.  
Physicochemical properties and mechanism of action of enzymes, and their role in metabolic processes.
212. Enzyme Chemistry Laboratory. (3) I. Mr. Pardee  
One lecture and two three-hour laboratory periods weekly.  
Prerequisite: course 211 (may be taken concurrently), or consent of instructor.  
Experimental methods of enzyme chemistry and biological oxidations.
280. Research. (1-9) I and II. The Staff (Mr. Carpenter in charge)  
Students must enroll for not less than 4 units, except by special permission of the chairman of the department.
290. Seminar. (1) I and II. The Staff (Mr. Cowgill in charge)
299. Special Study for Graduate Students. (1-3) I and II.  
The Staff (Mr. Carpenter in charge)  
Reading and conference for properly qualified graduate students under the direction of a member of the staff.

\* Not to be given, 1954-1955.

Research Conference. (No credit.) I and II.

The Staff (Mr. Stanley in charge)

Members of the staff and advanced graduate students meet once a week to discuss research problems.

### Plant Biochemistry

#### UPPER DIVISION COURSES

123. Plant Biochemistry Laboratory. (2) I. Mr. Hassid  
Two three-hour laboratory periods weekly.  
Prerequisite: Biochemistry 102 (may be taken concurrently); Chemistry 5, 8.  
Introduction to methods of studying the properties and behavior of plant constituents with special emphasis on quantitative procedures.
- Microbial Metabolism (Bacteriology 103). (2) II.

#### GRADUATE COURSES

- \*222. Plant Biochemistry. (2) II. Mr. Stumpf  
Prerequisite: Biochemistry 102 or 100A-100B with grade of C or higher, or consent of instructor.  
Lectures on the chemistry of important plant constituents and on processes such as photosynthesis, respiration, and carbohydrate, nitrogen and fat metabolism.
- \*225. Microbial Metabolism Laboratory. (3) II.  
Mr. Barker, Mr. Doudoroff, Mr. Stanier  
One lecture and two three-hour laboratory periods weekly.  
Prerequisite: Biochemistry 101A-101B or Plant Biochemistry 123; Bacteriology 103 (may be taken concurrently) and consent of instructor.  
Experimental techniques used in research in microbial metabolism including fermentation analysis; manometric, nutritional, and tracer techniques; use of enzyme preparations; and isolation and identification of products of intermediary metabolism.
- 280P. Research. (1-9) I and II.  
Mr. Barker, Mr. Conn, Mr. Delwiche, Mr. Hassid
- 290P. Seminar. (1) I and II.  
Mr. Barker, Mr. Conn, Mr. Delwiche, Mr. Hassid  
A seminar on plant biochemistry.

#### (GIVEN AT RIVERSIDE)

- 203A-203B. Research in Plant Physiology. (1-6; 1-6) Yr. Mr. Sinclair
- 205A-205B. Seminar in Plant Physiology. (1-1) Yr.  
The Staff (Mr. Sinclair in charge)

### Physiological Chemistry

#### UPPER DIVISION COURSES

- 101M. Medical Biochemistry. (8) II.  
Mr. Greenberg, Mr. Tarver, Mr. Allen, Mr. Duggan  
Four lecture and four three-hour laboratory periods weekly.  
Prescribed for students in the first year of the School of Medicine to fulfill the requirements in biochemistry.  
Lectures on the physicochemical basis of life processes, a survey of the chemical nature of lipids, carbohydrates, proteins, vitamins, and hormones, a discussion of the changes that these substances undergo in the animal body, and a general survey of the field of nutrition and energy exchange.

\* Not to be given, 1954-1955.

- Laboratory practice in biochemical procedures including urine and blood analyses.
103. Medical Biochemistry. (4) II. The Staff (Mr. Greenberg in charge)  
Prerequisite: Chemistry 5, 8, and 9, or 12, Zoölogy 1A-1B and consent of instructor.  
Equivalent to the lecture part of Biochemistry 101M. Enrollment limited.
104. Medical Biochemistry Laboratory. (4) II. The Staff (Mr. Greenberg in charge)  
Prerequisite: course 103 (may be taken concurrently).  
Laboratory practice in animal biochemistry, including urine and blood analysis.
110. Advanced Biochemistry. (5) I. Mr. Allen  
Two lecture and three three-hour laboratory periods weekly.  
Prerequisite: courses 102 or 100A and 123 or 101A, or course 101M.  
Lectures and laboratory work appertaining to blood analysis, respiratory gas analysis, and other methods that are used in biochemical laboratories and that illustrate normal and abnormal life processes.
- 180M. Research. (3-5) I and II. The Staff (Mr. Allen in charge)  
Prerequisite: courses 100A and 101A or 101M with a grade of B or higher.  
A limited number of selected students will be given topics for investigation under the direction of a member of the staff.

GRADUATE COURSES

- \*201. Protein Metabolism. (2) I. Mr. Tarver  
Selected topics in the metabolism of amino acids and proteins.
- \*205. Biochemistry of Cancer. (2) I. Mr. Greenberg  
Survey of the biochemistry of neoplastic growth, tumors, and the tumor-bearing host.
- 280M. Research. (1-9) I and II. The Staff (Mr. Greenberg in charge)  
Not less than 4 units except by special permission of the chairman of the department.
- 290M. Seminar. (1) I and II. The Staff (Mr. Greenberg in charge)  
A seminar on the metabolism of the vertebrates.
- 299M. Special Study for Graduate Students. (1-3) I and II. The Staff (Mr. Greenberg in charge)  
Reading and conference for properly qualified graduate students under the direction of a member of the staff.

RELATED COURSES IN OTHER DEPARTMENTS

- Anatomy 101 (6), 102 (3).  
Bacteriology 101 (6), 102 (4), 103 (2), 104 (4), 106 (2), 107 (2).  
Botany 111 (4), 160A-160B (2-2), 161A-161B (2-2).  
Chemistry 100 (3), 101 (3), 102 (3), 103 (3), 104 (3), 109 (3), 110A-110B (6), 111 (3), 112 (5) 112C (3), 114H (3), 115 (3).  
Entomology 106 (5), 110 (3), 128 (4).  
Food Technology 113 (3), 116 (4), 120 (3).  
Genetics 100 (4), 104 (3).  
Home Economics 101A (3), 101B (3), 112A-112B (3-3), 114 (4), 118A-118B (4-4), 119 (3).  
Physics 125 (1), 126 (2), 126L (1), 128 (1), 128L (2), 131 (2).

\* Not to be given, 1954-1955.

- Physiology 100A-100B (6), 104 (2), 106 (2), 107 (3), 108 (3), 110A-110B (6), 112 (3), 120A (3), 120B (3), 120C (3).  
 Plant Nutrition 115 (2), 117 (2).  
 Public Health 150A-150B (8-8), 160A-160B (3-3).  
 Soil Science 111 (3), 114 (3).  
 Zoölogy 100 (4), 101 (2), 101C (2), 102 (2), 102C (2), 103 (2), 106 (4), 107 (2), 114 (3), 119A-119B (2-2), 120A-120B (2-2).

## BOTANY

(Department Office, 2017 Life Sciences Building)

- Lee Bonar, Ph.D., *Professor of Botany and Curator of Mycological Collections.*  
 Lincoln Constance, Ph.D., *Professor of Botany (Chairman of the Department) and Curator of Seed Plant Collections.*  
 Ralph Emerson, Ph.D., *Professor of Botany.*  
 Adriance S. Foster, Sc.D., *Professor of Botany.*  
 Herbert L. Mason, Ph.D., *Professor of Botany and Director of the Herbarium.*  
 George F. Papenfuss, Ph.D., *Professor of Botany and Curator of Algal Collections.*  
 Alva R. Davis, Ph.D., Sc.D., *Professor of Plant Physiology, Emeritus.*  
 Thomas H. Goodspeed, Ph.D., Doctor (hon.c.), (La Plata), Sc.D. (hon.c.), *Professor of Botany, Emeritus, and Director of the Botanical Garden, Emeritus.*  
 Leonard Machlis, Ph.D., *Associate Professor of Botany.*  
 †Johannes M. Proskauer, Ph.D., *Assistant Professor of Botany.*  
 John G. Torrey, Ph.D., *Assistant Professor of Botany.*



- Daniel I. Arnon, Ph.D., *Professor of Plant Physiology.*  
 Eric Conn, Ph.D., *Lecturer in Plant Biochemistry.*  
 Louis Jacobson, Ph.D., *Associate Professor of Plant Nutrition.*  
 Gordon Mackinney, Ph.D., *Professor of Food Technology.*  
 Roy Overstreet, Ph.D., *Professor of Soil Chemistry.*  
 Perry R. Stout, Ph.D., *Professor of Plant Nutrition.*  
 Edward C. Stone, Ph.D., *Assistant Professor of Forestry.*

*Letters and Science List.*—All undergraduate courses in botany except 155 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Papenfuss.

*Preparation for the Major.*—Required: courses 1, 14 and 16, Chemistry 1A and 8, and Physics 2A-2B and 3A-3B. Recommended: Zoölogy 1A and elementary courses in other biological sciences; German and French under the foreign language requirement. Students who intend to major in *Functional Botany* (II below) are required to take, in addition, Chemistry 1B and 5, and are advised to take Mathematics 3A-3B. If the lower division program is crowded, one or more of the following courses may be postponed until the student reaches the upper division: courses 14 and 16, and Chemistry 1B, 5, and 8.

*The Major.*—The courses in botany are organized on levels of increasing

† Sabbatical leave in residence, fall semester, 1954-1955.



specialization corresponding to the elementary (course 1), intermediate (courses 14, 16, 108, 111), and the advanced stages of instruction. Requirement for the major are: (1) course 108 and 111; (2) a course in genetics; and (3) completion of field of emphasis I or II below.

*I. Structural Botany:* additional upper division courses in Botany or approved courses in related departments, to complete the upper division unit requirements.

*II. Functional Botany:* Biochemistry 102, and three or four additional upper division courses selected from Botany, Bacteriology, Biochemistry, Chemistry, Food Technology, Plant Nutrition, Soil Science, or Zoölogy, to complete the upper division unit requirements.

#### LOWER DIVISION COURSES

1. General Botany. (5) I. Mr. Papenfuss  
Lectures and laboratory.  
An introduction to the fundamental principles of biology as illustrated by plants, with emphasis on the morphology, physiology, and phylogenetic relations of the major plant groups.  
Designed as the basic course in botany for all students of plant or animal science. Not open to students who have completed course 12.
12. Introduction to the Structure and Function of Plants. (4) I and II.  
I. Mr. Constance; II. Mr. Emerson. Mr. Constance, Mr. Emerson  
Lectures and demonstration periods. Designed primarily for students who desire a general acquaintance with the fundamentals of botany. Not a substitute for course 1. Not open to students who have completed course 1.
14. Comparative Morphology of Thallophytes and Bryophytes. (4) II.  
Lectures and laboratory. Mr. Bonar, Mr. Proskauer  
Prerequisite: course 1.
16. Comparative Morphology of Vascular Plants. (4) I. Mr. Foster  
Lectures and laboratory.  
Prerequisite: course 1.

#### RELATED COURSES IN OTHER DEPARTMENTS

General Paleontology (Paleontology 1).  
General Bacteriology and Microbiology (Bacteriology 2).

#### UPPER DIVISION COURSES

In addition to requirements specifically noted, the prerequisite for all upper division courses is course 1. Under exceptional circumstances Botany 12 may fulfill this requirement with the consent of the instructor.

#### Morphology and Taxonomy

101. Mycology. (4) II. Mr. Emerson  
Lecture and laboratory.  
Prerequisite: course 14.  
The structure and development of the fungi. Myxomycetes, Phycomycetes, and Ascomycetes.
102. Mycology. (4) I. Mr. Bonar  
Lectures and laboratory.  
Prerequisite: course 14. Course 101 recommended but not required.  
Fungi Imperfecti and Basidiomycetes.

- \*104. Bryophyta and Basic Land Plants. (4) I. Mr. Proskauer  
Lectures and laboratory.  
Prerequisite: courses 14 and 16.  
To be offered every other year.  
An exploration of the ancient lines in the green land plants but predominantly a study of the present-day Bryophytes.
105. Plant Anatomy. (4) II. Mr. Foster  
Lectures and laboratory.  
Prerequisite: course 16 and consent of instructor.  
Comparative structure and growth of the meristems; development and structure of important cell types, tissues, and tissue systems; comparative anatomy of stem, root, and leaf. Emphasis is placed upon the anatomy of gymnosperms and angiosperms.
107. Algae. (4) II. Mr. Papenfuss  
Lectures and laboratory.  
Prerequisite: course 14.  
To be offered every other year.  
Advanced morphology and taxonomy of algae.
108. Taxonomy of Seed Plants. (4) II. Mr. Constance  
Lectures, laboratory, and field work.  
A survey of the spermatophytes, with lectures on phylogeny and classification; laboratory and field work with collection and identification practice.
- 110A. Phylogenetic Taxonomy. (3) I. Mr. Mason  
Lecture and laboratory.  
Prerequisite: courses 105 and 108.  
Analysis of morphological problems fundamental to the systems of classification, with laboratory work on selected problems in morphology.
- 110B. Phylogenetic Taxonomy. (3) II. Mr. Mason  
Lecture and laboratory.  
Prerequisite: course 108, and Genetics 100.  
110A is not prerequisite to 110B.  
An introduction to population studies and experimental and other research methods applicable to taxonomy.

## RELATED COURSES IN OTHER DEPARTMENTS

Plant Diseases (Plant Pathology 120).  
Technique of Plant Pathology (Plant Pathology 121).  
Advanced Paleobotany (Paleontology 120).  
Microbial Metabolism (Bacteriology 103).  
Soil Microbiology (Soil Science 111).  
Wood Technology (Forestry 114).

## Plant Physiology

111. Elementary Plant Physiology. (4) I and II. Mr. Machlis, Mr. Torrey  
I: Mr. Torrey; II: Mr. Machlis.  
Lectures and laboratory.  
Prerequisite: Chemistry 1A and 8.
- 160A-160B. Lectures in Plant Physiology. (2-2) Yr.  
160A: Mr. Machlis; 160B: Mr. Torrey. Mr. Machlis, Mr. Torrey  
Prerequisite: course 111. Biochemistry 102 is recommended.  
An advanced undergraduate course devoted to the comprehensive study of the physiology of plants.

\* Not to be given, 1954-1955.

161A-161B. Laboratory in Plant Physiology. (2-2) Yr.

161A: Mr. Machlis; 161B: Mr. Torrey. Mr. Machlis, Mr. Torrey

Prerequisite: course 111, 160A-160B (may be taken concurrently),  
Chemistry 5. Biochemistry 102 is recommended.

To accompany Botany 160A-160B.

#### RELATED COURSES IN OTHER DEPARTMENTS

General Biochemistry (Biochemistry 102).

Physical Chemistry (Chemistry 109, 111).

Physicochemical Biology (Zoölogy 101, 101C, 102, 102C).

Soils as a Medium for Plant Growth (Soil Science 110, 112, 113).

Principles of Forest Ecology (Forestry 103).

Properties of Colloidal Particles and Systems (Soil Science 114).

The Nutrition of Green Plants (Plant Nutrition 115, 117).

General Ecology (Zoölogy 125).

#### Cytology and Genetics

130. Plant Cytology. (4) I.

Lectures and laboratory.

Anatomy and physiology of the cell.

Mr. Goodspeed

#### RELATED COURSES IN OTHER DEPARTMENTS

Principles of Genetics (Genetics 100).

Cytogenetics (Genetics 101, 101C).

Biometrical Genetics (Genetics 102).

Organic Evolution (Genetics 103A-103B).

Technique of Plant Pathology (Plant Pathology 121).

Microscopic Technique (Zoölogy 4).

Cytology (Zoölogy 107, 107C).

Physicochemical Biology (Zoölogy 101, 101C, 102, 102C).

Genetics (Zoölogy 114).

Methods of Biological Investigation with Optical Instruments of Precision  
(Zoölogy 119A-119B).

#### General Courses

150. History of Botany. (3) II.

Lectures, discussions, and reports.

Open to students with upper division standing in botany and major  
students in other biological sciences with the approval of the instructor.

Mr. Goodspeed

151. Principles of Plant Distribution. (3) I.

Open to students with upper division standing in botany and major  
students in other biological sciences with consent of instructor.

Mr. Mason

\*155. Botanical Microtechnique. (2) II.

Prerequisite: courses 105 and 130, or their equivalents and consent of  
instructor.

Mr. Proskauer

Special techniques in the processing of plant material for histological  
and cytological study.

199A-199B. Special Study for Advanced Undergraduates. (1-4; 1-4) Yr.

The Staff (Mr. Bonar in charge)

Open to specially qualified seniors with consent of instructor.

\* Not to be given, 1954-1955.

## RELATED COURSES IN OTHER DEPARTMENTS

- Tertiary Floras of Western America (Paleontology 121).  
 Principles of Forest Ecology (Forestry 103).  
 Geography of Domesticated Plants and Animals (Geography 161).

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

## 201A-201B. Research. Yr.

Mr. Foster (in charge), Mr. Bonar, Mr. Constance, Mr. Emerson,  
 Mr. Goodspeed, Mr. Machlis, Mr. Mason, Mr. Papenfuss, Mr.  
 Proskauer, Mr. Torrey

Credit according to the work completed.

Original investigations of special problems in the field, laboratory, herbarium, or botanical garden.

## 203. Seminar in Cryptogamic Botany. (1) II.

Mr. Bonar (in charge), Mr. Emerson, Mr. Papenfuss, Mr. Proskauer  
 Prerequisite: qualified graduate students.

A seminar on problems in fungi and lower green plants.

## 205. Seminar in Morphology and Taxonomy of Vascular Plants. (1) I.

Mr. Mason (in charge), Mr. Constance, Mr. Foster

## 206. Seminar in Plant Physiology. (1) II.

Mr. Stone (in charge), Mr. Arnon, Mr. Conn, Mr. Jacobson, Mr.  
 Machlis, Mr. Mackinney, Mr. Overstreet, Mr. Stout, Mr. Torrey

Prerequisite: qualified graduate students, with consent of the staff member in charge.

A seminar on problems of plant physiology in the fields of botany, food technology, forestry, plant nutrition, and soil science.

The fall semester of this seminar is listed under Plant Nutrition 206.

## 211A-211B. Advanced Plant Physiology. (2-2) Yr.

Mr. Machlis, Mr. Torrey  
 Prerequisite: courses 105 and 160A-160B, 161A-161B, Biochemistry 102, and consent of instructor.

Intensive reading of the classical and recent literature in the field of plant physiology with informal group discussions.

Offered every other year.

**BUSINESS ADMINISTRATION**

(Department Office, 113 South Hall)

William L. Crum, M.A., Sc.D. (hon.), Ph.D., *Professor of Economics (Vice-Chairman of the Department of Business Administration)*.

Leonard A. Doyle, C.P.A., Ph.D., *Professor of Business Administration*.

\*Walter Galenson, Ph.D., *Professor of Industrial Relations*.

Robert A. Gordon, Ph.D., *Professor of Economics*.

Ewald T. Grether, Ph.D., LL.D., *Flood Professor of Economics (Chairman of the Department of Business Administration)*.

Roy W. Jastram, Ph.D., *Professor of Business Administration*.

Clark Kerr, Ph.D., LL.D., *Professor of Industrial Relations*.

Frank L. Kidner, Ph.D., *Professor of Economics*.

\*Maurice Moonitz, C.P.A., Ph.D., *Professor of Accounting*.

\* Absent on leave, 1954-1955.

- †David A. Revzan, Ph.D., *Professor of Business Administration.*  
 †Arthur M. Ross, Ph.D., *Professor of Business Administration.*  
 William K. Schmelzle, M.B.A., Ph.D., *Professor of Business Administration.*  
 Lawrence L. Vance, Ph.D., C.P.A., *Professor of Accounting.*  
 Ira B. Cross, Ph.D., *Flood Professor of Economics, Emeritus.*  
 Stuart Daggett, Ph.D., *Flood Professor of Transportation, Emeritus.*  
 Charles C. Staehling, M.S., C.P.A., *Professor of Accounting, Emeritus.*  
 \*John P. Carter, Ph.D., *Associate Professor of Business Administration.*  
 John W. Cowee, Ph.D., *Associate Professor of Insurance.*  
<sup>2</sup> Van Dusen Kennedy, Ph.D., *Associate Professor of Industrial Relations.*  
 Choh-Ming Li, Ph.D., *Associate Professor of Business Administration.*  
 Sherman J. Maisel, M.P.A., Ph.D., *Associate Professor of Business Administration.*  
 Dickson Reck, Ph.D., *Associate Professor of Business Administration.*  
<sup>1</sup> Royal A. Roberts, M.B.A., *Associate Professor of Business Administration.*  
 Paul F. Wendt, Ph.D., *Associate Professor of Finance.*  
 David A. Alhadef, Ph.D., *Assistant Professor of Business Administration.*  
 Harry E. Allison, M.S., *Acting Assistant Professor of Business Administration.*  
 Frederick E. Balderston, Ph.D., *Assistant Professor of Business Administration.*  
 Eugene H. Beem, Ph.D., *Assistant Professor of Business Administration.*  
 Michael Conant, Ph.D., J.D., *Acting Assistant Professor of Business Administration.*  
 Leslie Cookenboo, Jr., Ph.D., *Acting Assistant Professor of Business Administration.*  
 Joseph W. Garbarino, Ph.D., *Assistant Professor of Business Administration.*  
 F. Theodore Malm, Ph.D., *Assistant Professor of Business Administration.*  
 Daryl G. Mitton, M.B.A., Ph.D., *Assistant Professor of Business Administration.*  
 Frederic P. Morrissey, Ph.D., *Assistant Professor of Business Administration.*  
 Catharine De Motte Quire, Ph.D., *Assistant Professor of Accounting.*  
 Jack Dean Rogers, M.B.A., Ph.D., *Assistant Professor of Business Administration.*  
 Frederick J. Seubert, M.B.A., Ph.D., *Assistant Professor of Business Administration.*  
 Milo W. Smith, J.D., *Assistant Professor of Business Law.*  
 George J. Staubus, M.B.A., Ph.D., C.P.A., *Assistant Professor of Accounting.*  
<sup>1</sup> Dow Votaw, M.B.A., LL.B., *Assistant Professor of Business Law.*  
 James E. Walter, Ph.D., *Assistant Professor of Business Administration.*  
 Richard R. Carll, M.A., *Associate in Business Administration.*  
 Roy J. Hensley, B.S., *Associate in Business Administration.*  
 James R. Longstreet, M.B.A., *Associate in Business Administration.*  
 Dale L. McKeen, M.B.A., *Associate in Accounting.*

\* Absent on leave, 1954-1955.

† Sabbatical leave in residence, 1954-1955.

<sup>1</sup> In residence fall semester only, 1954-1955.

<sup>2</sup> In residence spring semester only, 1954-1955.

Morton F. Moss, M.B.A., C.P.A., *Associate in Accounting.*

Byron J. Norwood, M.B.A., *Associate in Business Administration.*

William G. Panschar, B.S., *Associate in Business Administration for the spring semester.*

Albert H. Schaaf, A.B., *Associate in Business Administration.*

Robert R. Schutz, Ph.D., *Associate in Business Administration.*

George D. Shelby, A.B., *Associate in Business Administration.*

Reed K. Storey, B.S., C.P.A., *Associate in Business Administration.*

Waino W. Suojanen, M.B.A., *Associate in Accounting.*



Curtis C. Aller, Jr., A.B., B.L.H., *Lecturer in Business Administration.*

Malcolm M. Davisson, J.D., Ph.D., *Professor of Economics.*

Albert A. Ehrenzweig, Dr.Jur., J.D., LL.M., J.S.D., *Professor of Law.*

John P. Holland, Jr., B.S., C.P.C.U., *Lecturer in Business Administration.*

Thomas N. St. Hill, Ph.B., *Lecturer in Business Administration.*

Raymond A. Smardon, Jr., A.B., *Lecturer in Business Administration.*

Franklin C. Stark, J.D., *Lecturer in Business Law.*

John T. Wheeler, Ph.D., *Visiting Associate Professor of Business Administration.*

The requirements for the curriculum in the School of Business Administration are listed in the CIRCULAR OF INFORMATION.

*Letters and Science List.*—Courses 1A, 1B, 10, 18, 100, and 150 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

#### LOWER DIVISION COURSES

1A-1B. Principles of Accounting. (3-3) Yr. Beginning each semester.

Mr. McKeen, Mr. Moss, Mr. Storey, Mr. Suojanen, \_\_\_\_\_, \_\_\_\_\_

Two lectures and one two-hour laboratory section weekly to be arranged.

Prerequisite: at least sophomore standing. 1A is a prerequisite to 1B.

It is recommended that students who plan to enter the School of Business Administration complete this course in their sophomore year.

10. General Accounting. (3) I and II.

Mrs. Quire

Prerequisite: at least sophomore standing in any department of the University. Not open to students who have taken or are planning to take course 1A-1B.

A survey of accounting principles and procedures, particularly as they affect the individual.

18. Business Law: Introduction. (3) I and II.

Mr. Conant, Mr. Stark, Mr. Votaw

Prerequisite: at least sophomore standing.

Introduction to law; contracts; sales; and agency.

#### UPPER DIVISION COURSES

Prerequisite: Economics 1A-1B, 2, and junior standing except where special provision has been made for students in certain curricula.

100. Economics of Enterprise. (3) I and II.

Mr. Alhadef, Mr. Allison, Mr. Balderston, Mr. Beem, Mr.

Cookenboo, Mr. Doyle, Mr. Hensley, Mr. Longstreet, Mr.

Panschar, Mr. Schutz

Not open to students taking Economics 100A. Primarily for juniors. The development of economic analysis applicable to the problems of

business enterprises in the areas of price, output, and utilization of resources; examination of the effects of business practices and policy on industry structure, consumers, labor, and government.

101. Business Fluctuations and Forecasting. (3) I and II.  
Mr. Garbarino, Mr. Hensley, Mr. Maisel,  
Mr. Schaaf, Mr. Schutz, Mr. Shelby
- Prerequisite: course 100.  
Not open to students who have taken Economics 100B.  
General analysis of the factors responsible for economic instability and of the forecasting and other management problems thereby created for the business firm.
105. Business Law: Law of Business Organization and Regulation. (3) I and II. Mr. Conant
- Prerequisite: course 18.  
Legal aspects of various types of business organization including partnerships and corporations; general survey of the law of trade regulation.
106. Real Estate Law. (3) II. \_\_\_\_\_
- Prerequisite: course 180.  
Historical development of the law of real property; estates in land; other legal matters affecting real estate.
109. Business Law: Law of Negotiable Instruments and Security Devices. (3) I and II. Mr. Smith
- Prerequisite: course 18.  
Negotiable instruments, particularly as devices for transferring credit; a survey of various mechanisms for securing credit such as mortgages, conditional sales, trust receipts, pledges.
- 121A-121B. Advanced Accounting. (3-3) Yr. Beginning each semester.  
A two-hour laboratory period to be arranged. \_\_\_\_\_, Mr. Staubus
- Prerequisite: course 1A-1B.  
Intensive study of the advanced theory of accounts and its application. Selected problems and reading on the various phases of accounting procedure. Required for those specializing in accounting.
- 121C. Advanced Accounting. (3) I and II. \_\_\_\_\_
- Prerequisite: courses 121A-121B, and 122.  
Continuation of 121A-121B; consolidated statements, preparation of funds statements, index numbers in accounting, special problems in analysis of financial statements. Not open to students who have taken courses 126 or 132.
122. Cost Accounting. (3) I and II.  
Mr. Doyle, Mr. Staubus, Mr. Suojanen, Mr. Vance
- Lectures, and a two-hour laboratory period to be arranged.  
Prerequisite: course 1A-1B.  
Principles of cost compilation and cost accounting techniques including the methods of job order, process and standard costs, with attention to cost control devices and managerial use and analysis of cost accounting data; primary emphasis on industrial applications.
123. Auditing. (3) I and II. Mr. Vance, \_\_\_\_\_
- Lectures, and a two-hour laboratory period to be arranged.  
Prerequisite: course 121A.  
Procedures for verification of financial records used by public accountants and internal auditors, including ethical, legal, and other aspects of the public accountant's work.

124. Budgetary Control and Accounting Systems. (3) I. Mr. Staubus  
Prerequisite: courses 121A-121B, 122.  
The preparation and administration of budgets, the design and maintenance of efficient accounting systems for managerial control and the quantitative analysis of specific problems confronting business management.
131. Corporation Finance. (3) I and II.  
Mr. Crum, Mr. Longstreet, Mr. Morrissey, Mr. Walter  
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.
132. Interpretation of Financial Statements. (3) I and II. Mr. Walter  
Prerequisite: courses 1A-1B, 131, and consent of instructor. Not open to students who have taken course 121C or 126.  
Methods of analyzing and interpreting financial statements, primarily in terms of their use in banking, corporation finance, and investment management. Should not be elected by students specializing in accounting.
133. Investments. (3) I and II. Mr. Walter  
Prerequisite: course 131.  
A study of the sources of, and demand for, investment capital, operations of security markets, determination of investment policy for individuals and institutions, and current procedures for analysis of different classes of securities.
135. Economics of Insurance. (3) I and II. Mr. Cowee  
An introduction to the underlying principles of insurance followed by a descriptive study of the practices in the more important branches of the insurance business.
136. Life Insurance. (3) II. Mr. Cowee  
Prerequisite: course 135.  
A nontechnical study of principles and practice.
137. Property Insurance. (3) I. Mr. Holland  
Prerequisite: course 135.
138. Casualty Insurance. (3) I and II. Mr. Cowee, Mr. Holland  
Prerequisite: course 135.
140. Production Organization and Management. (3) I and II.  
Mr. Malm, Mr. Mitton, Mr. Reek, Mr. Schmelzle, Mr. Seubert, Mr. Schutz  
Primarily for juniors.  
An introduction to the theory and practice of production management; the problems of internal organization; the management of physical resources; product development; materials control; production control; production standards; managerial controls.
142. Production Planning and Control. (3) I and II.  
Mr. Mitton, Mr. Rogers  
Prerequisite: course 140. Recommended: course 145.  
Production planning and budgeting; development of the production control system, including product development, materials control, plant and equipment analysis, production standards and methods, personnel and supervision; control of production quantity through routing, scheduling, and dispatching; quality control—inspection and statistical quality control; measurement of production efficiency.



## 145. Industrial Procurement. (3) II.

Prerequisite: course 160.

The problems met in purchasing by industrial organizations. A study of major buying policies, the sources of material, the quantity and quality needed, and the relation to price and production cost. Inspection, inventory control, storage, and reciprocal buying are subjects for oral discussion and for the study of executive report writing.

## 150. Industrial Relations. (3) I and II.

Mr. Aller, Mr. Garbarino, Mr. Kennedy, Mr. Kerr, Mr. Seubert

Students will not receive credit for both Economics 150 and course 150.

Designed to help beginning students understand labor-management issues through a study and interpretation of labor history, labor law, unionism, employer organization and policies, collective bargaining, wages, employment, social security, and problems of public policy.

## 151. Personnel Administration. (3) I and II.

Mr. Malm, Mr. Rogers, Mr. Smardon

Prerequisite: course 150 or Economics 150, or consent of instructor.

Personnel policies and procedures, with special attention to the structure of personal relationships within the enterprise as it affects personnel management, and to the development and administration of the wage structure of a firm.

## 152. Collective Bargaining System. (3) I and II.

Mr. Garbarino, Mr. Kennedy

Prerequisite: course 150 or Economics 150.

The nature, instrumentalities, and structure of collective bargaining. Analysis of union agreement provisions and their economic and political significance. Bargaining experience in major industries. Determinants of peace and conflict in industrial relations.

## 153. Labor Law. (3) I and II.

Mr. Davisson

Prerequisite: course 150 or Economics 150.

A study of federal and state laws and court decisions affecting hours, wages, strikes, boycotts, picketing, union recognition and operation, legality of collective agreements, etc. A discussion of the National Labor Relations Act, Fair Labor Standards Act, and other legislation.

## 160. Marketing. (3) I and II.

Mr. Allison, Mr. Balderston, Mr. Beem, Mr. Norwood, Mr. Panschar

The evolution of markets and marketing; market structure, organization and behavior; marketing functions; pricing and price policy; marketing problems of producers of raw materials, agriculturists, manufacturers, wholesalers and retailers; marketing costs and efficiency; public and private regulations.

## 161. Foreign Marketing. (3) I and II.

Mr. Li

Prerequisite: course 160.

The marketing functions in foreign trade; organization and structure of import and export markets; export selling; foreign market analysis; price policies and price quotations; shipping procedure; customs requirements; government controls; settlement of commercial disputes.

## 162A-162B. Retail Store Management. (3-3) Yr.

Mr. Roberts, ———

Prerequisite: course 160.

163. Advertising. (3) I. Mr. Roberts  
 Prerequisite: course 160.  
 The basic concepts of advertising dealing with the preparation and execution of copy for various types of media. Study of the English used in advertising, illustration, and other elements of copy. The evaluation of principal types of media. Study of underlying psychology in copy and the psychology of the consumer as developed through product and market research.
164. Advertising Policy. (3) II. Mr. Jastram  
 Prerequisite: courses 100, 160, 163, or consent of instructor.  
 Executive consideration of advertising in relation to price policy and the competitive problems of the firm.
165. Sales Analysis and Sales Management. (3) I and II.  
 Prerequisite: course 160. Mr. Roberts, \_\_\_\_\_  
 Sales analysis and forecasting; organization of sales department; planning and policy determination; selection, training, compensating, and supervising sales force; territorial analysis; cost analysis, business and economic appraisal of selling.
166. Wholesaling. (3) II. Mr. Balderston, Mr. Revzan  
 Prerequisite: course 160.  
 The meaning and importance of wholesaling; its place in the marketing structure; functions of wholesaling; the agency structure of wholesaling; internal managerial aspects; government regulations; trends; and costs, profits, and efficiency.
170. Transport Economics. (3) I and II. Mr. Cookenboo  
 The demand for transportation; cost behavior of the important transport technologies, including private transportation; rate structures; government regulation; duties and responsibilities of carriers; government subsidies and promotional policies; growth rates and profit rates. Several field trips to be arranged.
- \*171. Ocean Transportation. (3) II. Mr. Carter  
 Historical development of ships and shipping; ocean routes, ports, and terminals; rates, documents; legislation; current problems of American shipping.
173. Air Transportation. (3) I. Mr. Carl  
 A survey of civil aviation: physical characteristics of aircraft, airports, and airways; government aviation agencies; air-carrier operations, services, rates, costs and finances; airport management; legal problems arising from the use of the airspace; international air transport; evaluation of employment opportunities.
174. Traffic Management. (3) II. \_\_\_\_\_  
 A technical survey of the purchase and sale of transportation; selection of routing; tariffs and their interpretation; rate structures and rate construction; rate claims and commission proceedings; analysis of bills of lading, loss and damage claims; plant and warehouse location.
175. Public Utilities. (3) I. Mr. Morrissey  
 The basis of control, administrative and judicial machinery employed, problems of service, price, competition, and monopoly.

\* Not to be given, 1954-1955.

176. Problems of Highway Transport. (3) II. Mr. Cookenboo  
The movement of goods and people on highways; the organization, rates and practices of the for-hire branch of the industry; the general economic effects of highway transport developments; important problems in regulation, taxation and public policy.
180. Introduction to Real Estate and Urban Land Economics. (3) I and II. Mr. Maisel, Mr. Wendt  
The nature of real property; the principles of urban land utilization; classification of property rights; urban development; real property valuation; the real estate market and its functions; the organization of the real estate business; government regulation of real estate practices.
181. Valuation of Real Property. (3) II. Mr. Wendt  
Prerequisite: course 180.  
The concepts, methods, and principles of land valuation; the factors influencing real estate values and income; trends in real property values and appraisal procedures in the urban real estate market.
182. Economics of the Building Industry. (3) I. Mr. Maisel  
Prerequisite: course 180 or consent of instructor.  
Building as a problem in industrial organization; the variety, size, and instability of the market for buildings; the industry as presently constituted, contracting, subcontracting, financing; the problems of costs and efficiency.
183. Real Estate Financing. (3) I. Mr. Schaaf  
Prerequisite: course 180.  
The nature of real estate markets and their financing. Emphasis is on allocation of financial resources; market structure; problems of equity financing; mortgage lending; constructions lending; institutional practices and authority; financing risks; and government activity in real estate financing.
185. Foreign Exchange. (3) I and II. Mr. Li  
Prerequisite: Economics 135.  
Comparison of foreign and domestic exchange operations and problems; import-export banking; structure and operation of the free and controlled exchange markets; exchange rate policies and problems; payments arrangements; monetary areas; gold markets; and similar institutions and arrangements.
191. Management Problems and Policies. (3) I and II. Mr. Reck, Mr. Rogers, Mr. Schmelzle  
Prerequisite: senior standing and courses 100, 140, 160.  
Integration of the subject matter of the required courses in business administration through the study of the problems of top management organization, administrative techniques, and policy formulation. The case method supplements extensive reading. Written reports are required.
- 198A-198B. Directed Group Study. (1-3; 1-3) Yr. The Staff (Mr. Grether in charge)
- 199A-199B. Special Study for Advanced Undergraduates. (1-3; 1-3) Yr. The Staff (Mr. Grether in charge)  
Designed for senior students with at least a B average.

## FIRST-YEAR COURSES FOR GRADUATE STUDENTS

Designed for graduate students who did not have an undergraduate major in Business Administration. For information concerning the Graduate Curriculum in Business Administration, see the ANNOUNCEMENT OF THE SCHOOL OF BUSINESS ADMINISTRATION.

- 100G. Quantitative Methods and Their Use in Business Operation. (9) I. Mr. Doyle, Mr. Wheeler  
 The development of statistical and accounting data and their use in managing a business enterprise; the economic theory of the firm and the place and use of quantitative methods in applying theory to business operation; the relation between the individual firm and the economy as a whole.
- 118G. Legal Aspects of Business Administration. (3) I. Mr. Votaw  
 Legal problems of organizing, operating, and terminating a business.
- 131G. Financial Policies of Business. (3) II. Mr. Morrissey  
 Prerequisite: course 100G, or consent of instructor.  
 A study of business finance, with emphasis upon financial problems and policies of corporations; attention is given also to the role of commercial banks and that of institutional and other investors in supplying funds for corporations.
- 140G. Production Organization and Management. (3) II. Mr. Reck  
 Prerequisite: course 200, or consent of instructor.  
 A study of the principles of organization and production management. Emphasis is placed on the theory of business organization and the principles of planning, directing, and controlling product development, plant layout and location, equipment selection, inventory, and production standards.
- 150G. Industrial and Personnel Relations. (3) II. Mr. Ross  
 Prerequisite: course 100G, or consent of instructor.  
 Objectives and problems of management and labor in the modern industrial enterprise. Historical development of American industrial relations, unionism, collective bargaining, and industrial conflict. Elements of personnel administration.
- 160G. Marketing Organization and Policies. (3) II. Mr. Revzan  
 Prerequisite: course 100G, or consent of instructor.  
 The evaluation of marketing, markets, and theory of marketing; market structure, organization, and behavior; marketing functions; pricing and price policies; marketing problems of extractive industry producers, manufacturers, wholesalers, retailers; trends; marketing costs and efficiency; public and private regulations.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

221. Advanced Accounting Problems. (3) I. \_\_\_\_\_  
 Accounting problems in consignments, ventures, insurance, estates and trusts, and other topics, including problems which integrate and extend techniques and skills introduced in other courses.
222. Advanced Cost Accounting. (3) II. Mr. Doyle  
 Prerequisite: courses 121A-121B, 122.
223. Seminar in Auditing. (3) II. Mr. Vance  
 Prerequisite: courses 121A-121B, 123.  
 Historical background of the public accounting profession; development and current status of auditing standards; prominent recent and current professional problems; application of statistical sampling theory to auditing procedure.

226. Specialized Accounts. (2) I. Mr. Vance  
Will cover fiduciary accounting in 1954-1955. Accounting problems in estates, trusts, bankruptcies, and corporate reorganizations. Includes estate tax, gift tax, and related income tax procedure.
228. Income Tax Procedure. (3) I and II. Mr. Smith  
Prerequisite: course 121A-121B.  
A study of the federal and California laws relating to personal, estate, and corporation income taxes, from the accounting point of view, including a brief survey of social security, gift, and state taxes.
- 229A-229B. Seminar in Accounting Theory. (3-3) Yr.  
Prerequisite: course 121A-121B. Mr. Doyle, Mr. Wheeler  
229A. A survey of accounting literature with emphasis upon development of accounting theory. Includes early history, formal statements of principles, special depreciation problems, relation of economics and accounting, and the effect of price-level changes upon financial statements.  
229B. Intensive study of current issues in accounting theory, e.g., asset valuation and income determination with emphasis upon controversial issues, special problems of regulated industries, consolidated financial statements.
230. Seminar in Money and Credit. (3) I. Mr. Alhadeff  
Prerequisite: Economics 135.
232. Money Markets and Capital Markets. (3) II. Mr. Morrissey  
Prerequisite: course 131 and Economics 135.  
The organization and functions of, and the important influences upon, money and capital markets in the United States. Primarily concerned with private institutions operating in these markets. The influence of government financing operations and regulations is also considered.
233. Investments. (3) II. Mr. Wendt  
Prerequisite: course 133 and consent of instructor.  
Review of developments in institutional and individual investment policy. Tax problems and investment timing. Study of comparative investment performance of major classes of securities. Cycle theory and investment policy. Criteria of growth industries.
234. Problems in Business Finance. (3) I and II. Mr. Crum  
Application of principles of finance to the financial management of corporate enterprises, with special emphasis upon the financing of expansion. Program includes reading assignments on principles and methods of finance, and individual student reports on financial problems of particular corporations.
239. Seminar in Insurance. (3) I and II. Mr. Cowee, Mr. Ehrenzweig
255. Seminar in Industrial Relations. (3) I. Mr. Ross  
Prerequisite: Two industrial relations courses and consent of instructor.  
Theoretical background for advanced study of collective bargaining and personnel administration. Wage determination; structure and operation of labor markets; origin and direction of labor movements; theory of industrial peace and conflict.
256. Seminar in Collective Bargaining. (3) II. Mr. Ross  
Prerequisite: course 152 or equivalent. Open to a limited number of senior students with consent of instructor.  
Studies of the bargaining process; the legal and factual basis of collective bargaining; the provisions of collective agreements; administra-

- tion of agreements, including negotiation and arbitration of grievances; processes of disputes settlement; influence of the larger environment, particularly mobilization and war.
257. Managerial Policies and the Labor Factor. (3) II. \_\_\_\_\_  
Sources and objectives of managerial policies. Analysis of specific problems in terms of general situations. Selection of tools of personnel administration, procedures and special policies which are most appropriate and effective. Unconscious changes in or departures from broad policy.
- \*259. Wage Policies and Wage Behavior. (3) I. Mr. Kerr
260. Advanced Marketing. (3) I and II. Mr. Revzan, \_\_\_\_\_  
Prerequisite: course 160 and graduate standing.  
Readings, case, problem, and special report work. Intended primarily for graduate students in business administration who are candidates for the professional M.B.A. degree but are not qualified for course 269A-269B.
268. Marketing Investigation. (3) II. \_\_\_\_\_  
Prerequisite: courses 160, 260, 290, Economics 2, and Psychology 180.  
The meaning of marketing research; classification and content of marketing policies and problems; marketing research methods; investigation and analysis of specific marketing research projects; presentation of marketing research results; and evaluation of effectiveness of marketing research.
- 269A-269B. Seminar in Marketing. (3-3) Yr. Mr. Grether  
269A. Critical review of the literature of marketing, including background and historical materials, market organization (the marketing channel, agency structure and vertical integration), marketing functions.  
269B. Prices and price policies, area structure, costs and efficiency, commodity marketing, and public and private regulation.
279. Seminar in Transportation. (3) II. \_\_\_\_\_  
Analyses in selected topics of importance in the transportation field.
280. Real Estate and Urban Land Economics. (3) I. Mr. Wendt  
Prerequisite: courses 106, 180, 181, and 182, or consent of instructor.  
Theory of urban land utilization, problems in housing market analysis; housing finance and policy.
290. Business Investigations and Analysis. (3) I and II. \_\_\_\_\_, Mr. Jastram  
Meaning of research and scientific method. Forms of scientific method applicable to business research. Types of business research problems, and available types of materials. Actual research procedure, and application by student to his Business Administration 299 research project.
298. Seminar in Business Policy. (3) I and II. Mr. Schmelzle, Mr. St. Hill
299. Research in Business Problems. (1-6) I and II.  
The Staff (Mr. Grether in charge)  
Primarily for candidates for the degree of Master of Business Administration.

## CHEMISTRY AND CHEMICAL ENGINEERING

(Department Office, 110 Gilman Hall)

Melvin Calvin, Ph.D., *Professor of Chemistry.*

James Cason, Jr., Ph.D., *Professor of Chemistry.*

\* Not to be given, 1954-1955.

Robert E. Connick, Ph.D., *Professor of Chemistry.*  
Burris B. Cunningham, Ph.D., *Professor of Chemistry.*  
William F. Giaouque, Ph.D., *Professor of Chemistry.*  
George Jura, Ph.D., *Professor of Chemistry.*  
Wendell M. Latimer, Ph.D., *Professor of Chemistry.*  
Edwin F. Orlemann, Ph.D., *Professor of Chemistry.*  
Isadore Perlman, Ph.D., *Professor of Chemistry.*  
Kenneth S. Pitzer, Ph.D., *Professor of Chemistry (Chairman of the Department).*

Richard E. Powell, Ph.D., *Professor of Chemistry.*  
Gerhard K. Rollefson, Ph.D., *Professor of Chemistry.*  
Glenn T. Seaborg, Ph.D., *Professor of Chemistry.*  
Thomas D. Stewart, Ph.D., *Professor of Chemistry.*  
Theodore Vermeulen, Ph.D., *Professor of Chemical Engineering.*  
Charles R. Wilke, Ph.D., *Professor of Chemical Engineering (Chairman of the Division of Chemical Engineering).*

Walter C. Blasdale, Ph.D., *Professor of Chemistry, Emeritus.*  
George E. Gibson, Ph.D., *Professor of Chemistry, Emeritus.*  
Joel H. Hildebrand, Ph.D., Sc.D., *Professor of Chemistry, Emeritus.*  
Axel R. Olson, Ph.D., *Professor of Chemistry, Emeritus.*  
Charles W. Porter, Ph.D., *Professor of Chemistry, Emeritus.*  
Leo Brewer, Ph.D., *Associate Professor of Chemistry.*

\*LeRoy A. Bromley, Ph.D., *Associate Professor of Chemical Engineering.*  
William G. Dauben, Ph.D., *Associate Professor of Chemistry.*  
William D. Gwinn, Ph.D., *Associate Professor of Chemistry.*  
Donald N. Hanson, Ph.D., *Associate Professor of Chemical Engineering.*  
Henry Rapoport, Ph.D., *Associate Professor of Chemistry.*  
David H. Templeton, Ph.D., *Associate Professor of Chemistry.*  
Donald S. McClure, Ph.D., *Assistant Professor of Chemistry.*  
Rollie J. Myers, Jr., Ph.D., *Assistant Professor of Chemistry.*  
Donald S. Noyce, Ph.D., *Assistant Professor of Chemistry.*  
Chester T. O'Konski, Ph.D., *Assistant Professor of Chemistry.*  
George C. Pimentel, Ph.D., *Assistant Professor of Chemistry.*  
John O. Rasmussen, Ph.D., *Assistant Professor of Chemistry.*  
Andrew Streitwieser, Jr., Ph.D., *Assistant Professor of Chemistry.*  
Charles W. Tobias, Ph.D., *Assistant Professor of Chemical Engineering.*  
Andrew Acrivos, Ph.D., *Instructor in Chemical Engineering.*  
Dan F. Bradley, Ph.D., *Instructor in Chemistry.*  
Bruce R. McGarvey, Ph.D., *Instructor in Chemistry.*  
Pierre S. Payot, M.D., Ph.D., *Instructor in Chemistry.*  
Eugene E. Petersen, Ph.D., *Instructor in Chemical Engineering.*  
Earle S. Scott, Ph.D., *Instructor in Chemistry.*  
Wayne B. Hadley, Ph.D., *Instructor in Chemistry.*



Charles W. Koch, Ph.D., *Lecturer in Analytical Chemistry.*  
David N. Lyon, Ph.D., *Lecturer in Chemistry.*

*Letters and Science List.*—All undergraduate courses except 143, 144, 145A–145B, 146A–146B, 147, 149, and 152 are included in the Letters and Science List. For regulations governing this list, see page 7.

\* Absent on leave, 1954–1955.

*Entrance with Advanced Standing.*—All undergraduate students entering the University with advanced standing, and students returning to the University after an absence of two years or more, who desire to take courses in chemistry more advanced than course 1B, must present themselves on or before the date of their registration to Mr. Rollefson, 121 Lewis Hall, who will determine from their credentials or by an informal examination which courses they may undertake.

*Choice of College.*—A student may pursue the study of chemistry by enrolling either in the College of Chemistry (see the CIRCULAR OF INFORMATION) or in the College of Letters and Science with a major in chemistry. In order to decide between the two alternatives, the student may note that the College of Letters and Science has certain general lower division requirements (see the CIRCULAR OF INFORMATION) outside the preparation for the major, while the curriculum of the College of Chemistry is restricted mainly to chemistry, physics, and mathematics during the first two years. An upper division program in chemical engineering is offered in the College of Chemistry.

*Letters and Science Upper Division Major Adviser:* Mr. Giauque.

*Preparation for the Major in the College of Letters and Science.*—The recommended preparation is as follows: course 1A-1B, and one or more of courses 5, 12; Physics 4A, 4B, 4C; Mathematics 3A, 3B, 4A, 4B; and a reading knowledge of German.

The above-mentioned courses, though recommended, are actually required only in so far as they constitute prerequisites for courses included in the major. Prospective major students should familiarize themselves with such prerequisites, and the possible course sequence governed by them. Thus, Mathematics 4A is prerequisite to Chemistry 110A which in turn is 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 from 24 to 30 units of upper division work in chemistry and allied subjects, taken in accordance with a plan approved by the departmental adviser. Normally at least 18 units of the major must be taken in the department, and must include courses 112 and 110A-110B, and one of courses 105, 111, and 120. If one year of quantitative analysis has been completed elsewhere, course 104 may be substituted for course 105.

All units in chemistry in excess of 13 are counted as upper division units toward the major; all units in chemistry in excess of 13, taken in the upper division, will count as upper division credit toward the 36-unit requirement. Ordinarily an average of at least 1.5 grade points per unit undertaken is required for admission to, or retention in, the major.

*Honor Students in the Upper Division.*—Upper division students in the College of Letters and Science who propose to make chemistry their major, are placed on the honors list when they have attained a scholarship average of at least grade B. Honor students are given a larger share of personal instruction and a greater opportunity to choose courses, and work within courses, in the manner best suited to individual needs and aims. Students not in the honors group are not, except in unusual circumstances and with the express permission of the instructor, permitted to enroll for honors courses (marked H) nor for undergraduate research. Students will not ordinarily be recommended for honors in chemistry at graduation unless their work includes courses 114H and 180H or other advanced courses approved by the Committee on Honors.

*Higher Degree.*—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.



## CHEMISTRY

## LOWER DIVISION COURSES

- 1A. General Chemistry. (5) I and II.  
Mr. Powell, Mr. Giauque, Mr. Gibson, Mr. Latimer, Mr. Connick, Mr. Jura, Mr. Gwinn, Mr. McClure, Mr. O'Konski, Mr. Templeton, Mr. Brewer, Mr. Orlemann, Mr. Perlman, Mr. Rasmussen, Mr. Rollefson, Mr. Scott, Mr. Myers, Mr. Bradley, Mr. McGarvey, Mr. Hadley  
I and II: Lectures (Mr. Powell).  
Prerequisite: high school chemistry or high grades in high school physics and mathematics. Admission will be determined by the student's high school grade, and by proficiency in arithmetic and first-year algebra, which will be tested by the examination in elementary mathematics given during the week of enrollment.
- 1B. General Chemistry, Qualitative Analysis. (5) II.  
Mr. Latimer, Mr. Gibson, Mr. Giauque, Mr. Jura, Mr. Brewer, Mr. Gwinn, Mr. McClure, Mr. O'Konski, Mr. Powell, Mr. Templeton, Mr. Connick, Mr. Perlman, Mr. Rasmussen, Mr. Rollefson, Mr. Scott, Mr. McGarvey, Mr. Bradley, Mr. Hadley  
Lectures (Mr. Latimer).  
Prerequisite: course 1A.
5. Quantitative Analysis. (3) I and II.  
Lecture and laboratory. Mr. Orlemann, Mr. Pimentel, Mr. Myers  
Prerequisite: course 1B with a grade of C or higher.
8. A Short Survey of Organic Chemistry. (3) I and II. Mr. Stewart  
Prerequisite: course 1A.  
Primarily for students not majoring in chemistry.
9. Organic Chemistry—Laboratory. (3) I and II.  
Lecture and laboratory. Mr. Rapoport, Mr. Streitwieser  
Prerequisite: course 1B with a grade of C or higher and course 8 (may be taken concurrently).
12. Organic Chemistry. (5) I and II.  
(Formerly numbered 12A.) Mr. Calvin, Mr. Streitwieser, Mr. Payot  
Lectures and laboratory work designed for students whose major is chemistry.  
Prerequisite: course 1B with a grade of C or higher.  
Introduction to the general theory of organic chemistry and the chemistry of aliphatic compounds.  
Students with previous credit in course 8 may receive only 2 units of credit for course 12.

## UPPER DIVISION COURSES

100. Organic Chemistry—Analytical Methods. (3) I and II.  
Prerequisite: courses 5 and 112. Mr. Noyce, Mr. Dauben
101. Organic Chemistry—Synthetic Methods. (3) I and II.  
Mr. Dauben, Mr. Rapoport  
Prerequisite: course 112. A reading knowledge of German is recommended.

102. Advanced Organic Chemistry. (3) I. Mr. Stewart  
Prerequisite: courses 8 and 9 or 12; 109 or 110B; and a reading knowledge of German.  
Kinetics and mechanisms of organic reactions; the determination of structure.
103. Advanced Organic Chemistry. (3) II. Mr. Calvin  
Prerequisite: courses 8 and 9 or 12; 109 or 110A; and a reading knowledge of German.  
Applications of electron structures and resonance to the chemical and physical properties of organic compounds.
104. Inorganic Chemistry. (3) I. Mr. Latimer  
Prerequisite: course 5.  
The interpretation and correlation of inorganic reactions.
105. Advanced Quantitative Analysis. (3) I and II. Mr. Orlemann, Mr. Pimentel  
Lectures and laboratory.  
Prerequisite: course 5.
109. Physical Chemistry—Brief Course. (3) I. Mr. McClure  
Prerequisite: course 5; one year of college physics.  
Selected topics in physical chemistry.  
Primarily for nonchemical majors.
- 110A–110B. Physical Chemistry. (3–3) Yr. Beginning each semester. Mr. Rollefson, Mr. Templeton  
110A. I: Mr. Rollefson; II: Mr. Templeton.  
110B. I: Mr. Templeton; II: Mr. Rollefson.  
Prerequisite: course 5, mathematics 4A, and Physics 4B.  
The general principles of physical chemistry and elementary thermodynamics.
111. Physical Chemistry—Laboratory. (3) I and II. Mr. Jura, Mr. Gwinn, Mr. McClure  
Prerequisite: course 110A (with a grade of C or higher), and 110B (which may be taken concurrently), or 109 with consent of instructor; also calculus.
112. Organic Chemistry. (5) I and II. Mr. Rapoport, Mr. Calvin, Mr. Noyee, Mr. Payot  
(Formerly numbered 12B.)  
Prerequisite: course 12 or 8 and 9.  
Introduction to the chemistry of aromatic and heterocyclic compounds.  
Simple enolate condensations.
- 112C. Organic Chemistry. (3) I and II. Mr. Calvin, Mr. Rapoport  
(Formerly numbered 12C.)  
Prerequisite: open only to students who received grade C or higher in course 12, taken at this University.  
Equivalent to the lecture part of 112. Primarily for students in the chemical engineering curriculum of the College of Chemistry, but open to students from other colleges with the consent of the instructor.
- 114H. Physical Chemistry—Thermodynamics. (3) I and II. Mr. Giaque, Mr. Brewer, Mr. Pitzer  
Prerequisite: courses 5, 110A–110B; Physics 4C or equivalent; familiarity with differential and integral calculus, and honors standing.
115. Microchemistry. (3) I and II. Mr. Cunningham, Mr. Koch  
Prerequisite: senior standing in chemistry.  
Synthesis and preparation of organic and inorganic samples on the milligram and microgram scale and their analysis by gravimetric and volumetric methods.

118. Chemistry of Surfaces and Colloids. (2) I. Mr. Jura  
Before enrolling, the student must satisfy the instructor that he has sufficient preparation in chemistry and physics to be able to read the literature in this field intelligently.
119. Photochemistry. (2) II. Mr. Rollefson  
This course is offered in the form of independent study, with reports at regular intervals, and a final examination.  
Before enrolling, the student must satisfy the instructor that he has sufficient preparation in chemistry and physics to be able to read the literature in this field intelligently.
120. Advanced Inorganic Chemistry. (3) I and II. Mr. Connick, Mr. Templeton  
Lecture and laboratory.  
Prerequisite: courses 5, 104 or 105, and 109 or 110B.
122. Heterogeneous Equilibria. (2) I. Mr. Brewer  
Prerequisite: course 109 or 110B.
123. Nuclear Chemistry. (2) I. Mr. Seaborg, Mr. Perlman  
Prerequisite: senior standing.
125. Instrumental Methods. (3) II. Mr. O'Konski, Mr. Myers  
Prerequisite: courses 105 or 120, and 111, and consent of instructor.  
Theory and application of instrumental methods in such fields as spectroscopy, polarography, and radioactivity to chemical problems.
170. Methods and Concepts in Physical Science. (2) II. Mr. Hildebrand  
Prerequisite: upper division standing.  
Designed primarily as a contribution to liberal education for students majoring in the humanities and social sciences. May be taken by honor students on the "passed" or "not passed" basis.
- 180H. Research. (2-15) I and II. The Staff (Mr. Pitzer in charge)  
Prerequisite: course 110B, honors standing and consent of instructor.  
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.
185. Chemical Preparations. (2-5) I and II. The Staff (Mr. Pitzer in charge)  
Prerequisite: consent of instructor.  
Special laboratory work for advanced undergraduates.
199. Special Study for Advanced Undergraduates. (2-3) I and II. The Staff (Mr. Pitzer in charge)  
Any properly qualified student who wishes to pursue a problem of his own choice, through reading or nonlaboratory study, may do so if his proposed project is acceptable to the member of the staff with whom he works.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 207A. Organic Chemistry. (2) I. Mr. Cason  
Emphasis is placed on typing of reactions according to mechanism, and the application to synthetic studies of current knowledge of reaction mechanism, molecular structure, and steric factors. Particular attention is given to displacement reactions, enolate condensations, and the Grignard reaction.

- \*207B. Organic Chemistry. (2) II. Mr. Rapoport  
 Prerequisite: course 207A.  
 The chemistry of heterocyclic compounds, with emphasis on those of natural origin.
- 207C. Organic Chemistry. (2) I. Mr. Dauben  
 Prerequisite: course 207A.  
 The chemistry of polycyclic compounds of biological interest, with emphasis on sterols and related compounds.
- 207D. Organic Chemistry. (2) II. Mr. Noyce  
 Prerequisite: course 207A.  
 The chemistry of the terpenes, including discussion of the mechanism of rearrangements.
216. Physical Chemistry—Advanced. (3) II. Mr. Giauque  
 Prerequisite: courses 111 and 114H. Open to senior honor students with consent of instructor.  
 Selected topics. Use of variables other than pressure, temperature, and composition. Third Law of Thermodynamics. Evaluation of thermodynamic quantities from spectroscopic and other molecular data. Interionic attraction theory of electrolytic solutions.
217. Quantum Theory. (3) II. Mr. Pitzer  
 Recommended preparation: differential equations or advanced calculus, atomic physics and thermodynamics. Open to senior honor students with the consent of the instructor.
223. Advanced Nuclear Chemistry. (2) II. Mr. Seaborg, Mr. Perlman  
 Prerequisite: course 123.  
 Advanced survey of nuclear theory and experimentation. Primarily for chemistry students.
280. Research. (1-9) I and II. The Staff (Mr. Pitzer in charge)  
 Students limited to a program of 4 units may be allowed to enroll for 1 unit.  
 The laboratory is open at all times to a limited number of qualified graduate students who wish to pursue original investigations. Students who wish to enroll for this work should communicate with the chairman of the department well in advance of the opening of the semester in which the work is to be done. Such work will ordinarily be under the direction of some member of the instructing staff who will determine the credit value. A list of publications indicating the types of problems now under investigation in the laboratory will be sent on request.
290. Seminar. (1-4) I and II. The Staff (Mr. Pitzer in charge)  
 Open to properly qualified graduate students.  
 As a rule several seminars are offered each semester. The subjects will vary from year to year and will be announced at the beginning of each semester. The following subjects have been studied in recent seminars: Mechanisms of chemical reactions; X-ray diffraction in crystals; group theory and its applications to chemistry; spectroscopy; nuclear chemistry; high temperature reactions; organic synthesis; determination of structures of natural products.
299. Special Study for Graduate Students. (2-4) I and II.  
The Staff (Mr. Pitzer in charge)  
 Any properly qualified graduate student who wishes to pursue a prob-

lem of his own choice, through reading or nonlaboratory study, may do so if his proposed project is acceptable to the member of the staff with whom he works.

**Research Conference. (No credit)**

Members of the instructing staff and students engaged in graduate research meet once a week to discuss the various investigations in progress in the laboratory.

**CHEMICAL ENGINEERING**

**UPPER DIVISION COURSES**

For program of upper division work in this field, see under College of Chemistry, CIRCULAR OF INFORMATION.

**143. Introduction to Chemical Engineering. (3) I and II.**

Mr. Hanson, Mr. Wilke

Prerequisite: course 109 or 110A or Mechanical Engineering 105A (may be taken concurrently).

A survey of chemical industry in relation to major products, equipment and economics. Problem work on weight and heat balances in representative processes.

**144. Chemical Engineering Thermodynamics. (3) I and II.**

Mr. Tobias, Mr. Petersen

Prerequisite: course 110B (may be taken concurrently), or Mechanical Engineering 103 and 105A.

Thermal and volumetric properties of liquids and gases; interrelations of thermodynamic functions; power and refrigeration cycles; solutions and phase equilibria of multicomponent systems; critical phenomena; reaction energetics and equilibria.

**145A. Unit Operations Laboratory. (3) I and II.**

Mr. Hanson, Mr. Acrivos, Mr. Petersen

Prerequisite: course 146B and Mechanical Engineering 107, or Mechanical Engineering 132.

Material and energy measurements and performance analysis on separation equipment of representative industrial types.

**145B. Unit Operations Laboratory. (1-2) I and II.**

Mr. Hanson

Prerequisite: course 145A (may be taken concurrently).

Additional experiments in unit operations. An elective course for second semester seniors and graduate students in chemical engineering.

**146A. Chemical Engineering Unit Operations. (4) II.**

Mr. Vermeulen, Mr. Acrivos, Mr. Tobias

Prerequisite: course 110B (may be taken concurrently), 143 (with a grade of C or higher), or consent of instructor.

Thermodynamic and frictional effects for liquid and gas flow in process equipment. Heat transmission in solids and flow systems; radiation and pyrometry. Evaporation, mixing, filtration, crushing and grinding, mechanical separations.

**146B. Chemical Engineering Unit Operations. (4) I.**

Mr. Vermeulen, Mr. Tobias, Mr. Acrivos

Prerequisite: courses 110B, 143, and 146A or equivalent. Open to seniors in the College of Engineering concurrently enrolled in Chemical Engineering 144 or Mechanical Engineering 154, or with honor standing.

Separation operations: distillation, absorption, humidification, extraction, crystallization, absorption and drying.

147. Organic Chemical Unit Process. (3) II. Mr. Stewart, Mr. Petersen  
Prerequisite: courses 110B; 112 or 112C and 143, or consent of instructor.  
Reaction variables and kinetics, and product recovery problems in catalytic processes such as chlorination, nitration, sulfonation, fermentation, esterification, hydrolysis, alkylation, hydrogenation, cracking, and polymerization.
- 149-149H. Design of Chemical Process Plants. (2-3) II. Mr. Wilke  
Prerequisite: courses 144, 146A-146B.  
Class discussion of sources of data and of design principles, with individual and team study of selected plant design and process evaluation problems. Students with honor standing will be permitted to enroll for 3 units and will complete a comprehensive design project.
152. Electrochemical Engineering. (3) I. Mr. Tobias  
Prerequisite: courses 146B and 104, which may be taken concurrently, or consent of instructor. Electrical Engineering 100A-100B or 101 is recommended.  
Application of the principles of electrochemistry and of chemical engineering to the design and industrial operation of electrolytic processes.
- 180H. Research in Chemical Engineering. (2-6) I and II.  
Prerequisite: course 146B. The Staff (Mr. Pitzer in charge)  
Students with honor standing may prosecute original research under the direction of one of the members of the instructing staff. The consent of the instructor must be obtained.

## GRADUATE COURSES

Chemical Engineering 146B or its equivalent is prerequisite to all courses in this group.

244. Multistage Operations. (3) II. Mr. Hanson  
General theory and application of multistage separation processes. Particular consideration to design methods for binary and multicomponent distillation.
245. Diffusional Operations. (3) I. Mr. Wilke  
Modes of mass transfer, diffusion in gases and liquids, material transfer in static and flow systems, momentum-mass transfer analogies, prediction of mass transfer coefficients for packed column separations, plate efficiency, diffusion and chemical reaction, equipment-design methods.
246. Phase Equilibria. (2) I. Mr. Vermeulen  
Theory and applications of phase equilibria in chemical engineering operations. Special problems in extraction, azeotropic and extractive distillation.
249. Special Study for Graduate Students in Chemical Engineering. (2-4) I and II. The Staff (Mr. Wilke in charge)  
Properly qualified graduate students who wish to pursue independent study may work on the development of new calculation methods for a single unit operation or the application of existing design data to a single process.
250. Research in Chemical Engineering. (1-6) I and II. The Staff (Mr. Wilke in charge)  
Research facilities will be provided for graduate study in the unit physical operations and the unit chemical processes.

## 260. Seminar in Chemical Engineering. (2-4) I and II.

The Staff (Mr. Vermeulen in charge)

Open to properly qualified graduate students.

Reports, discussions, and group design studies in advanced fields of chemical engineering. Topics offered previously include: applications of thermodynamics; technology of high temperature; isotope-separation processes; mathematics in chemical engineering; transport properties of fluids; selected topics in chemical engineering unit operations.

## RELATED COURSES IN OTHER DEPARTMENTS

Mechanical Engineering 163. Flow Problems of the Process Industries. (3) II.

Mechanical Engineering 180. Selection of Process Equipment and Materials of Fabrication. (3) II.

Mechanical Engineering 266. Heat Convection. (3) II.

Metallurgy 111. Metallurgical Unit Operations Laboratory. (2) I.

Petroleum Engineering 209A-209B. Seminar in Petroleum Processing. (2-2) or (3-3) Yr.

**CHILD DEVELOPMENT**

An undergraduate Group Major in Child Development is offered in the College of Letters and Science and also an undergraduate major in child development in the Department of Home Economics. Information concerning these majors is presented in the CIRCULAR OF INFORMATION.

Graduate work leading to the master's and Ph.D. degrees is offered in the field of child development and also in education, home economics, and psychology. Requirements for the field are given in the Graduate Division bulletin entitled ANNOUNCEMENT IN THE SOCIAL SCIENCES.

Students interested in undertaking professional preparation as teachers, psychometrists, school psychologists, social welfare or public health workers or home demonstration agents will be helped by consulting faculty advisers in the professional schools indicated as early as possible in their undergraduate careers.

Upper division offerings relevant to the interests of students in child development and related fields are listed below:

Anatomy 102.

Anthropology 118A, 118B, 120, 125A, 125B, 153, 170.

Architecture 117.

City and Regional Planning 110.

Criminology 100A, 100B.

Economics 180.

Education 110, 111, 116, 153, 181.

Genetics 100, 103A, 103B.

Geography 176.

History 175A, 175B.

Home Economics 111, 132, 133, 135, 137, 138, 139, 140, 142, 144.

Philosophy 104, 108.

Physical Education 105, 140.

Physiology 102, 104, 107.

Psychology 105, 111 or 112, 113 or 113N, 114, 115, 116, 117, 136, 141, 145, 146A, 148A, 148B, 160, 161 or 162, 168.

Public Health 125.

Social Welfare 100.

Sociology and Social Institutions 104, 130, 132, 178.

Zoölogy 100, 104.

## CITY AND REGIONAL PLANNING

(Department Office, 101 City and Regional Planning Building)

†T. J. Kent, Jr., M.C.P., *Professor of City Planning.*

Francis Violich, B.S., *Associate Professor of City and Regional Planning and Lecturer in Landscape Architecture (Acting Chairman of the Department).*



Catherine Bauer (Catherine Bauer Wurster), A.B., *Lecturer in City and Regional Planning.*

Donald Foley, Ph.D., *Lecturer in City and Regional Planning.*

Jesse Reichel, *Lecturer in Architecture.*

Mellier G. Scott, Jr., A.B., *Lecturer in City and Regional Planning.*

Gordon Stephenson, A.B., M.C.P., *Visiting Professor of City and Regional Planning, Architecture, and Landscape Architecture.*

*Letters and Science List.*—All undergraduate courses in city and regional planning are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

The Department of City and Regional Planning, established in July, 1948, offers a two-year graduate program of professional training in the field of urban planning leading to the degree Master of City Planning.

The program includes courses in the theory and practice of urban planning offered by the department, and courses in related fields of study offered by members of other departments. Some of these courses may be open to qualified undergraduate students.

### UPPER DIVISION COURSES

110. Introduction to City Planning. (3) I. Mr. Scott  
 Survey of city planning as it has evolved in United States since 1800 in response to serious physical, social, and economic problems; examination of major concepts and procedures used by contemporary city planners and local governments to improve the urban environment. The course is open to majors in all fields.
- \*121. Urban Aesthetics. (2) II. \_\_\_\_\_  
 Development and present-day significance of the form of the urban environment; importance of urban form to the well-being of the individual and society; techniques available or necessary to make urban areas more satisfying aesthetically.

### GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Seminar in City Planning History and Theory. (2) I. Mr. Stephenson  
 Historical background of the modern city planning movement, and the theory and practice of contemporary city planning.
202. Seminar in City Planning Principles and Methods. (2) II. Mr. Violich  
 Description and analysis of the methods and techniques used in the practice of contemporary city planning.

\* Not to be given, 1954-1955.

† Absent on leave, 1954-1955.



203. Seminar in City Planning Law and Administration. (2) I. Mr. Violich  
 Survey of city planning and urban redevelopment legislation; legal basis for planning law, including review of legal aspects of administration of zoning and subdivision regulations; organizational and administrative problems of planning agencies and boards of adjustment.
204. Seminar in Advanced City Planning Theory and Comparative Programs. (2) II. Mr. Stephenson  
 Detailed examination and analysis of outstanding contemporary city planning programs; case study of the planning organization and program for London; analysis of the status of city planning programs for the metropolitan San Francisco Bay area.
211. City Planning Problems, First Course. (4) I. Mr. Foley, Mr. Reichel  
 Practical application of urban planning theory to problems of towns, cities, metropolitan regions, and urban counties, including elementary problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
212. City Planning Problems, Second Course. (4) II. Mr. Foley, Mr. Violich  
 Practical application of urban planning theory to towns, cities, metropolitan regions, and urban counties, including problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
213. City Planning Problems, Third Course. (4) I. Mr. Stephenson, Mr. Violich  
 Practical application of urban planning theory to problems of towns, cities, metropolitan regions, and urban counties, including advanced problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
221. Seminar in City Planning Research. (2) II. Mr. Foley  
 The social research phase of city planning; organization for research within the planning agency; the use of available source materials; the conduct of field surveys.
299. Directed Research. (2-4) I and II. The Staff (Mr. Violich in charge)  
 A limited number of exceptional senior students may be admitted.

## CLASSICS

(Department Office, 5218 Dwinelle Hall)

- Murray B. Emeneau, Ph.D., *Professor of Sanskrit and General Linguistics.*  
 Arthur E. Gordon, Ph.D., *Professor of Latin (Chairman of the Department).*  
 †Louis Alexander MacKay, M.A. (Oxon.), *Professor of Latin.*  
 William Kendrick Pritchett, Ph.D., *Professor of Greek.*  
 H. R. W. Smith, Ph.D., *Professor of Latin and Classical Archaeology and Associate Curator of Classical Archaeology.*  
 William H. Alexander, Ph.D., LL.D., F.R.S.C., *Professor of Latin, Emeritus.*  
 Monroe E. Deutsch, Ph.D., LL.D., *Professor of Latin, Emeritus.*  
 Ivan M. Linforth, Ph.D., *Professor of Greek, Emeritus.*  
 Leon J. Richardson, A.B., LL.D., *Professor of Latin, Emeritus.*

† Sabbatical leave in residence, 1954-1955.

Joseph E. Fontenrose, Ph.D., *Associate Professor of Classics.*  
 William M. Green, Ph.D., *Associate Professor of Latin.*  
 William C. Helmbold, Ph.D., *Associate Professor of Classics.*  
 Elroy L. Bundy, Ph.D., *Assistant Professor of Classics.*  
 Frederic Peachy, Ph.D., *Assistant Professor of Classics.*  
 W. Gerson Rabinowitz, A.B., *Acting Assistant Professor of Greek.*



Joshua Whatmough, M.A. (Cantab.), *Sather Professor of Classical Literature for the spring semester.*

*Letters and Science List.*—All undergraduate courses in Classics, Greek, Latin, and Sanskrit are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Peachy.

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

*The Major in Classics.*—Required: Greek 100, 101, 102, 103; Latin 105, 106, 107, 108.

#### GREEK

*Major Adviser:* Mr. Peachy.

*Preparation for the Major.*—Required: Greek 1 or 1A-1B. Recommended: Latin 1A-1B or 1, 2, 3, 4.

*The Major.*—The following courses must be included in the major of 24 units: (a) Greek 100, 101, 102, 103, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Greek. The remaining units of the 24 should be chosen, with the advice of the department, from the following: upper division courses in Classics, Greek, Latin, Sanskrit, and in the History of Ancient Art; History 111A.

#### LATIN

*Major Adviser:* Mr. Peachy.

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

*The Major.*—The following courses must be included in the major of 24 units: (a) Latin 105, 106, 107, 108, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Latin. The remaining units of the 24 should be chosen, with the advice of the department, from the following: upper division courses in Classics, Latin, Greek, Sanskrit; Art 153 (Aegean); Art 154A-154B (Greek); Art 159 (Roman); History 111B; but the department will consider as well other courses which the student may suggest.

#### CLASSICS

COURSES WHICH DO NOT REQUIRE A KNOWLEDGE OF THE GREEK OR THE  
 LATIN LANGUAGE

(Courses in this group are designated Classics 34, Classics 35, etc.)

#### LOWER DIVISION COURSES

10A-10B. Ancient Greek and Roman Civilization. (3-3) Yr. Mr. Gordon  
 10A: Greek. 10B: Roman.

Lectures and discussion; illustrative material. Either semester may be taken independently.

34. Epic Poetry: Homer and Vergil. (2) II. Mr. Gordon  
 A study of the *Iliad*, *Odyssey*, and *Aeneid* with reference to content, structure, significance, and influence.

35. Greek Tragedy. (2) I. Mr. Peachy  
Lectures on twelve Greek tragedies.
36. Plato. (2) I. Mr. Rabinowitz  
Lectures and readings. Selected dialogues.
- \*37A-37B. Survey of Greek Literature. (2-2) Yr. Mr. Helmbold  
A study of the main movements and personalities in classical Greek literature, Homer to Lucian.

## UPPER DIVISION COURSES

- \*135. Greek and Roman Comedy. (2) II. \_\_\_\_\_  
The form and development of comedy in Greece and Rome, with study of selected texts.
138. The Greek and Roman Historians. (2) II. Mr. Pritchett  
Lectures on the major classical historians.
- \*151. Greek Religion. (2) I. Mr. Fontenrose  
The worship of the gods in ancient Greece; cults and religious ideas.
170. Classical Archaeology. (2) Mr. Smith  
\*170A. Vase-Painting in Greece and Italy to 600 B.C.  
170B. Vase-Painting in Greece and Italy in the sixth century. (I)  
170C. Vase-Painting in Greece and Italy from 500 B.C. (II)
- \*171. Archaeological Method. (2) Mr. Smith  
171A; 171B; 171C. (II)  
A series of courses giving practice in the interpretation of classical antiquities in the Anthropological Museum of the University of California, and elsewhere.
178. Greek and Roman Mythology. (3) II. Mr. Fontenrose  
Myths, legends, and folk tales of ancient Greece and Italy; their place in the literature and art of both the ancient and the modern world.
- \*180A-180B. The Latin Classics in English. (2-2) Yr. Mr. MacKay  
180A. The Republic.  
180B. The Early Empire.  
Open to lower division students by consent of instructor.
185. Political and Social Thought of the Ancient Greeks. (2) I. Mr. Fontenrose  
A study of ideas about the state and society from Homer to Aristotle, with special attention given to Thucydides' *History*, Plato's *Republic*, and Aristotle's *Politics*.
- \*197. India. (2) I. Mr. Emeneau  
The social, economic, and political structure of modern India.



For graduate courses in Classics, see page 78.

## GREEK

(Courses in this group are designated Greek I, Greek 1A, Greek 1B, etc.)

## Language and Literature

## LOWER DIVISION COURSES

1. Greek for Beginners. Double Course. (5) II. Mr. Peachy

\* Not to be given, 1954-1955.

1A-1B. Greek for Beginners. (3-3) Yr. Mr. Pritchett, Mr. Rabinowitz

#### UPPER DIVISION COURSES

Greek 100, 101, 102, 103 should be completed before the other courses are undertaken.

100. Xenophon, *Anabasis*, and Attic Prose Writing. (3) I. Mr. Bundy

101. Homer. (3) II. Mr. Rabinowitz

102. Plato: *Apology and Crito*. (3) I. Mr. Rabinowitz

103. Drama. (3) II. Mr. Bundy

115. Senior Course in Greek Drama. (3) Mr. Peachy

\*115A. Aristophanes.

115B. Sophocles. II.

\*115C. Aeschylus.

120. Senior Course in Greek Prose Authors. (3). Mr. Pritchett

\*120A. Demosthenes.

120B. Thucydides. I.

\*120C. Herodotus.

\*139A-139B. Comparative Grammar of Greek and Latin. (2-2) Yr.

Mr. Helmbold

Prerequisite: at least Greek 101 or Latin 4, or consent of instructor.

139A: Phonology; 139B: Morphology. Either semester may be taken separately.

140. Greek Dialects. (3) II. Mr. Whatmough

150A-150B. Greek Prose Composition. (2-2) Yr. Mr. Peachy, Mr. Bundy  
(Course 150A formerly numbered 150.)

Students who have completed course 150 may not receive credit for course 150A.

Prerequisite: Greek 100.

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

Mr. Pritchett in charge

#### LATIN

(Courses in this group are designated Latin 1, Latin 2, etc.)

#### Language and Literature

#### LOWER DIVISION COURSES

1. Elementary Latin. Double Course. (5) II. Mr. Bundy

1A-1B. Elementary Latin. Beginners' Course. (3-3) Yr.

Mr. Fontenrose, Mr. Peachy

2. Elementary Latin (continuation of 1A-1B or 1). (4) I and II. Mr. Green  
Sections meet five hours per week.

Prerequisite: two years of high school Latin or Latin 1 or consent of instructor.

\* Not to be given, 1954-1955.

3. Latin Prose Readings. (4) I and II. Mr. Helmbold, Mr. Fontenrose  
Prerequisite: Latin 2 or equivalent.
4. Introduction to Virgil. (4) II. Mr. Smith  
Prerequisite: Latin 3 or equivalent.
- 9A-9B. Latin Composition. (2-2) Yr. Mr. Green  
Prerequisite: at least completion of Latin 2.  
Recommended to accompany Latin 3 and 4.
- 20A-20B. Introduction to Latin Literature. (3-3) Yr. Mr. MacKay  
Prerequisite: Latin 1A-1B or Latin 1 or equivalent.  
Reading and translation of representative selections, prose and poetry.

## UPPER DIVISION COURSES

Prerequisite: Latin 4. Latin 105, 106, 107, 108 should be completed before the other courses (except 109A-109B) are undertaken.

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

105. Livy. (3) I. Mr. Bundy
106. Horace: *Odes and Epodes*. (3) II. Mr. Helmbold
107. Cicero: *Tusculan Disputations*. (3) II. Mr. Green
108. Roman Comedy. (3) I. Mr. Green
- 109A-109B. Composition and Sight Reading. (2-2) Yr. Mr. Smith
145. Senior Course in Latin Poetry. (3) Mr. Helmbold  
\*145A. Lucretius.  
\*145B. Augustan Poets.  
145C. Juvenal. I.
150. Senior Course in Latin Prose Authors. (3) Mr. Helmbold  
\*150A. Sallust.  
\*150B. Seneca.  
150C. Tacitus. II.
166. Latin Verse Composition. (1) I. Mr. Smith
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
Mr. Gordon in charge

## SANSKRIT

(Courses in this group are designated Sanskrit 190A, Sanskrit 190B, etc.)

## Language and Literature

## UPPER DIVISION COURSES

- 190A-190B. Elementary Sanskrit. (3-3) Yr. Mr. Emeneau
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
Mr. Emeneau

\* Not to be given, 1954-1955.

## CLASSICS

## GRADUATE COURSES

All graduate courses in this department are designated Classics (Classics 200, etc.).

(Concerning conditions for admission to graduate courses, see page 10)

200. Proseminar. (3) I. Mr. Helmbold  
 An introduction to the general literature of classical philology, to methods of research, and to textual criticism.
206. The Greek Lyric Poets. (3) I. Mr. Bundy
219. Plato. (3) II. Mr. Rabinowitz
240. Cicero. (3) II. Mr. Green
242. Caesar. (3) I. Mr. Fontenrose
245. Horace: *Odes*. (3) II. Mr. Helmbold
- 257A-257B. Greek Epigraphy. (3-3) Yr. Mr. Pritchett
262. Documents of the Augustan Age. (3) I. Mr. Gordon
- 271A-271B. Advanced Course in Archaeological Method. (2-2) Yr.  
 Mr. Smith
- 290A-290B. Advanced Sanskrit. (1-5; 1-5) Yr. Mr. Emeneau  
 Such texts are read as are suited to the students' needs. Pali and Prakrit also will be studied as the occasion arises.
299. Special Study. (1-5) I and II. Mr. Green in charge

## COMPARATIVE LITERATURE

*Committee in Charge:*

- Marianne Bonwit, Ph.D., *Associate Professor of German*.  
 Bertrand H. Bronson, Ph.D., *Professor of English*.  
 \*Yuen Ren Chao, Ph.D., Litt.D., *Agassiz Professor of Oriental Languages and Literature*.  
 Michele DeFilippis, Ph.D., *Professor of Italian*.  
 Assar G. Janzén, Ph.D., *Professor of Scandinavian*.  
 Waclaw Lednicki, Ph.D., *Professor of Slavic Languages and Literatures*.  
 †Louis Alexander MacKay, M.A. (Oxon.), *Professor of Latin*.  
 Warren Ramsey, Ph.D., *Associate Professor of French and Comparative Literature*.  
 David W. Reed, Ph.D., *Assistant Professor of English*.  
 Arnold H. Rowbotham, Ph.D., *Professor of French (Chairman of the Committee)*.  
 Aldo Scaglione, Dottore in Lettere, *Assistant Professor of Italian*.  
 Arturo Torres-Rioseco, Ph.D., *Professor of Latin American Literature*.

Instruction in comparative literature is not organized as a single administrative unit in the University, but the relevant courses are offered by a number of departments. The degree of Master of Arts will be conferred upon

\* Absent on leave, 1954-1955.

† Sabbatical leave in residence, 1954-1955.

qualified graduate students who complete the requirements. Prospective candidates for the degree should consult the chairman of the committee in charge.

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Preparation for the Major.*—Required: an adequate knowledge of two foreign languages; 12 upper division units in each of two literatures, read in the original, or an equivalent competence, tested by examination. Recommended: further study in courses dealing with more than one literature, such as Modern European Drama; Dramatic Art 160A-160B, Dramatic Theory; English 44A-44B, Masterpieces of Literature; English 125B, The Novel in Western Civilization; English 247, Theory of Poetry; English 257B, Methods and Assumptions of Recent Literary Critics; English 269, Theory of Fiction; Philosophy 136A-136B-136C, Aesthetics; Philosophy 146, Philosophy in Literature.

*The Major.*—Twenty units of upper division or graduate courses and a thesis, in accordance with Plan I of the requirements for the degree of Master of Arts. A subcommittee will be in charge of the candidate's program and will be responsible for approving and directing the work on the thesis.

#### UPPER DIVISION COURSES

121. Romanticism in Western Europe. (3) I. Miss Bonwit  
Prerequisite: Knowledge of French or German (preferably both) required.  
The Movement in France and Germany, with references to English Romanticism.
- 151A-151B. The Renaissance in the Literatures of Italy, France and England. (2-2) Yr. Mr. Scaglione  
A course in the ramifications of the Renaissance movement in the countries named, with special reference to Italy, including discussions of the different phases of the movement and the contribution of various great writers to it.
- Russian Novelists of the Nineteenth Century and Western European Literatures. (Slavic Languages and Literature 133A.) (3) I. Mr. Lednicki

#### GRADUATE COURSES

- \*201A-201B. The Symbolist Movement in European Literature. (2-2) Yr. Mr. Ramsey  
A study of Symbolism, especially in French, German, English and Spanish literatures.
- 202A-202B. The French Heritage in Spanish-American Literature. (2-2) Yr. Mr. Torres-Rioseco  
Studies in the Parnassian, Symbolist and Modernist movements.
298. Special Study for Graduate Students. (1-4) I and II. Committee in charge

## CRIMINOLOGY

(Department Office, 218 Building T-2)

Douglas M. Kelley, M.D., Med.Sc.D., *Professor of Criminology.*

Paul L. Kirk, Ph.D., *Professor of Criminalistics and Professor of Biochemistry.*

\* Not to be given, 1954-1955.

- Austin H. MacCormick, A.B., M.A., *Professor of Criminology.*  
 Arthur H. Sherry, A.B., LL.B., *Professor of Criminology and Law.*  
 Orlando W. Wilson, A.B., *Professor of Criminology (Chairman of the Department).*  
 M. Edwin O'Neill, M.S., *Associate Professor of Criminalistics.*



- Jesse L. Carr, M.D., *Clinical Professor of Pathology and Legal Medicine and Lecturer in Criminology for the fall semester.*  
 John D. Holstrom, A.B., *Lecturer in Criminology.*

The requirements for the curricula in the School of Criminology are listed in the CIRCULAR OF INFORMATION.

#### UPPER DIVISION COURSES

Prerequisite: junior standing, except sophomore students scheduled to attain junior standing in midyear who may enroll in basic courses in the fall semester.

- 100A-100B. Crime Causation, Prevention, and Correction. (3-3) Yr.  
 Course 100A not prerequisite to 100B. Mr. MacCormick  
 Orientation survey of the causes of juvenile delinquency and adult crime, methods of prevention, and current practices in the correctional treatment of offenders in institutions and on probation and parole.
101. Crime Investigation. (2) I. Mr. Wilson  
 Principles involved in the investigation of crimes; police organization and procedures for the investigation of crimes.
103. Psychological Aspects of Criminology. (3) I. Mr. Kelley  
 Prerequisite: Psychology 1A.  
 Analysis of personality is undertaken with emphasis on constitutional, personal, social, and cultural components, and relationships to criminal behavior are surveyed. Methods of personality measurement are presented as potential tools for the criminologist.
- 105A-105B. Police Administration. (3-3) Yr. Mr. Wilson  
 Course 105A is prerequisite to 105B except for criminalistic majors.  
 Introduction to the principles of police organization and administration, discussion of police statistics, criminal identification, and investigation; educational methods for combating crime and vice, and controlling traffic.
107. Personal Identification. (3) II. Mr. O'Neill  
 A study of methods used in the identification of persons, living and dead; fingerprint identification; Bertillonage; sight recognition; portrait parle; anatomical bases, including skeletal remains to ascertain sex, race, age, size, and identity.
111. Physical Evidence. (2) I. Mr. O'Neill  
 Lecture and laboratory.  
 Prerequisite: course 101 (may be taken concurrently).  
 Enrollment limited to criminology majors.  
 Search at crime scenes for physical evidence and photographing, recording, preserving, and transporting it to the laboratory. Cast preparation and tests conducted at crime scenes.



113. Legal Medicine. (3) I. Mr. Carr  
Prerequisite: Physiology 1.  
Effect of impact of criminal actions upon the human body; physical, chemical, and other traumatic influences. Survey of body fluids, tissues, different classes of poisons, their recognition, and untoward effects. Pathological changes in death and their significance in criminology.
- 115A-115B. Legal Relations Involved in Criminology. (3-3) Yr. Mr. Sherry  
Prerequisite: enrollment restricted to criminology majors.  
Basic principles of the law of crimes, criminal procedure and evidence; the enforcement processes of the criminal law; the legal relation of the police function to the prosecuting function, the judicial function and the administration of justice; constitutional limitations of the police power.
151. Microchemical Testing of Physical Evidence. (5) II. Mr. Kirk  
Lecture and laboratory.  
Prerequisite: Chemistry 5, 12, and 112C, with a grade of C or higher and consent of instructor.  
Application of microchemical and microscopic methods to the examination of physical evidence.
153. Advanced Techniques in Evidence Examination. (3) I and II.  
Laboratory. Mr. Kirk  
Prerequisite: course 151 and consent of instructor.  
A limited number of students may pursue advanced microchemical examination of evidence and special problems in criminalistic techniques with emphasis on instrumental methods and the newer chemical separation techniques.
155. Comparative Microscopy. (3) II. Mr. O'Neill  
Lecture, demonstrations, and laboratory.  
Prerequisite: course 111. Recommended: Botany 1 and Zoölogy 4.  
Comparative studies of gross and microscopic characteristics of crime exhibits including glass, metal, wood, cloth, paper, string, and rope; examinations of tools and tool marks; principles of comparison of bullets and cartridge cases; reproduction by impressions, casts, and photographs.
157. Questioned Documents. (3) I. Mr. O'Neill  
Lecture, demonstrations, and laboratory.  
Prerequisite: course 111 and consent of instructor.  
Problems of handwriting, handprinting, and typewriting in the examination of questioned documents, including studies of erasures, alterations, and obliterations; methods of restoring and deciphering effaced writing; document photography; investigation of anonymous letters.
161. Psychiatric Aspects of Criminology. (3) II. Mr. Kelley  
Prerequisite: Criminology 103.  
Abnormal personalities are examined from a clinical diagnostic viewpoint in relation to anti-social activities; the etiology, psychopathology, prognosis, and treatment of the common mental disorders are considered in their medico-legal aspects.
162. Therapeutic Theories in Preventive Criminology. (3) II. Mr. Kelley  
Prerequisite: course 161 (may be taken concurrently) or satisfactory equivalents.  
The relationships of mental hygiene and psychiatry to criminological problems are explored from the viewpoint of those methodologies tending to prevent the formation of criminal patterns or to ameliorate already established trends through various psychotherapeutic techniques.

163. Interrogation and Detection of Deception. (4) I. Mr. Kelley  
 Prerequisite: course 161.  
 Three lectures and one three-hour laboratory section each week.  
 All phases of interrogation including techniques for deception detection are studied from an historical, psychological, physiological and psychiatric point of view. Laboratory experiments and techniques designed to uncover attempts at deception in unlawful situations, together with theory and practice of report writing are presented.
164. Instrumental Detection of Deception. (2) II. \_\_\_\_\_  
 One lecture and one three-hour laboratory section each week.  
 Prerequisite: course 163.  
 Advanced evaluation is undertaken of instrumental methods studied in their physiological, psychological and legal aspects. Past and present techniques are surveyed through study with various apparatus and from this experience theoretical postulations for future development are evolved and appraised.
171. Police Planning. (2) II. Mr. Wilson  
 Prerequisite: course 105B or consent of instructor.  
 Considerations in discovering and analyzing needs, formulating policies, developing plans and procedures, and evaluating their effectiveness. Analysis of distribution of personnel, measures of performance and service, selection, training and discipline, M. O., operating programs, procedural manuals, and tactics.
- \*172. Plant Security. (2) I. \_\_\_\_\_  
 The prevention of losses to private enterprises and government establishments from sabotage, other crimes, and accidents. Problems related to national defense, the organization and operation of security forces, and the use of protective devices.
174. Advanced Investigation. (2) I. \_\_\_\_\_  
 Study and evaluation of current trends and theories of investigation designed to develop awareness, understanding and maximum utilization of established or available channels of inquiry. Review of investigative assistance available from established public and commercial records, developed sources of information, books of account and bank records, and visual and audible surveillances.
182. Institutional Treatment of the Criminal and Delinquent. (2) I. \_\_\_\_\_  
 Mr. MacCormick  
 Modern philosophy and methods in the treatment of adult criminals and juvenile delinquents in correctional institutions.
184. Non-Institutional Treatment of the Criminal and Delinquent. (2) II. \_\_\_\_\_  
 Mr. MacCormick  
 Modern philosophy and methods in the non-institutional treatment of adult criminals and juvenile delinquents through probation, parole, and community services.
- 195A-195B. Proseminar in Criminalistics. (1-1) Yr. Mr. Kirk
199. Research and Special Study for Advanced Undergraduates. (1-4) I and II. The Staff

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 291A-291B. Seminar in Police Administration. (2-2) Yr. Mr. Wilson

\* Not to be given, 1954-1955.

292. Seminar in Problems in Criminal Law Enforcement. (2) II.  
Open to students in the School of Law. Mr. Sherry
- 293A-293B. Seminar in the Administration of Criminal Justice. (2-2) Yr.  
Mr. Holstrom
- 295A-295B. Seminar in Criminalistics. (1-1) Yr. Mr. Kirk
- 296A-296B. Seminar in the Correctional Treatment of Offenders. (2-2) Yr.  
Mr. MacCormick
299. Research and Special Study. (1-4) I and II. The Staff

## DECORATIVE ART

(Department Office, 104 Decorative Art Building)

Hope M. Gladding, *Professor of Decorative Art and Design.*

<sup>1</sup> Winfield Scott Wellington, M.A., Gr.Arch., *Professor of Design (Chairman of the Department of Decorative Art), Associate Curator of Art, Museum of Anthropology, and Director of the Art Gallery.*

Mary F. Patterson, *Associate Professor of Decorative Art and Design, Emeritus.*

Mary A. Dumas, M.A., *Associate Professor of Decorative Art.*

Anna Hadwick Gayton (Anna Gayton Spier), Ph.D., *Associate Professor of Decorative Art and Associate Curator of Textiles, Museum of Anthropology.*

Lea Van Puymbroeck Miller, M.F.A., *Associate Professor of Decorative Art.*  
Lucretia Nelson, M.A., *Associate Professor of Design (Acting Chairman of the Department of Decorative Art for the spring semester).*

John E. French, Ph.D., *Assistant Professor of Decorative Art.*

Willard V. Rosenquist, M.A., *Assistant Professor of Decorative Art.*

Charles E. Rossbach, M.F.A., *Assistant Professor of Decorative Art.*

Yolanda S. Newby, M.A., *Acting Instructor in Decorative Art.*

Willis C. Kauffman, M.A., *Associate in Decorative Art.*

James W. Baughman, M.A., *Associate in Decorative Art.*

*Letters and Science List.*—All undergraduate courses in decorative art are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Wellington, Miss Gladding.

*Entrance with Advanced Standing.*—All undergraduate transfer students requesting advanced standing are required to present examples of their work for evaluation by the staff.

*Preparation for the Major.*—Required: course 6A-6B (4), 7A-7B (4), and Art 2A (2). Recommended: Architecture 1N (3); Art 2B (2), 3A (2), 3B (2); History 4A-4B (6). The recommended courses are actually required only in so far as they constitute prerequisites for upper division courses included in the major. Prospective major students should familiarize themselves with such course sequences.

In order to gain major status in the department, a student must have attained at least a 1.5 grade-point average in the lower division courses in decorative art preparatory to the major. Students who fail to maintain a satisfactory scholarship average may be dismissed from the major at any time.

<sup>1</sup> In residence fall semester only, 1954-1955.

*The Major.*—Required: 24 units of upper division work in decorative art and allied subjects, including courses 160A (2), 175A (2) or 175B (2), 176A (2), 180A–180B (6) or 193A–193B (6) or 195A–195B (6); Philosophy 136A (3) and other courses aggregating at least 6 units chosen from the remaining upper division courses in the department.

Three units chosen from the following allied courses in other departments may be taken as major work in decorative art: Anthropology 126 (3); Architecture 110 (1); Art 173 (2); Philosophy 136B (3); Sociology and Social Institutions 141A (3), 141B (3), 142 (3), or 145 (3).

Courses 175A–175B, 176A, 193A–193B, 195A–195B should normally be taken in the junior year. Courses 130A–130B, 196A–196B should be taken in the senior year.

*Honors.*—Senior students who have attained at least a B average in their major courses may enroll for course 199.

Honors at graduation are awarded to students who have completed their major work with distinction and have attained uniformly high grades in all their college work.

*Exhibits.*—Students' work may be retained by the department as exhibit material for a specified time.

#### LOWER DIVISION COURSES

6A–6B. Theory of Design and Color. (2–2) Yr. Beginning each semester.

Miss Nelson, Mr. French, Mr. Roszbach, Mr. Baughman,  
Mr. Rosenquist, Mr. Kauffman, Miss Dumas, Mrs. Newby

6A surveys the basic elements of the subject and their relation to everyday life through experience in designing with line, space, and color.

6B recapitulates and extends this experience.

7A–7B. Theory of Design and Color. (2–2) Yr. Beginning each semester.

Prerequisite: course 6A–6B. Mrs. Miller, Mr. French

Analysis of traditional and contemporary designs. Second-year problems that emphasize the integration of design theory with specific properties of material, process and function.

#### UPPER DIVISION COURSES

101. Reading Course in the Decorative Arts. (2) I and II.

The Staff (Miss Gladding in charge)

Prerequisite: courses 6A–6B and 7A–7B.

A course designed to acquaint students majoring in decorative art with the significant literature of the decorative arts. To know the important artists' work of the past and its effect on the present time. Required reading, museum reports, and discussion. Enrollment to be limited to twenty students.

127. Primitive Art. (3).

Miss Nelson

127A. Form as it applies to primitive art; the primitive arts of Paleolithic West Europe, South and West Africa and Arctic North America. (3) I.

\*127B. The primitive arts of Oceania and South America. (3) II.

127C. The primitive arts of Middle and North America. (3) II.

Prerequisite: 127A is prerequisite to 127B and 127C, but 127B is not prerequisite to 127C.

130A–\*130B. Interior Design. (2–2) Yr.

Mr. Wellington

130A is prerequisite to 130B.

Lectures: the design, selection, and arrangement of furniture with special consideration for its relation to the architectural background.

\* Not to be given, 1954–1955.

- 160A-160B. Advanced Design. (2-2) Yr. Beginning each semester. Miss Dumas  
 Prerequisite: courses 6A-6B, 7A-7B, and Art 2A. With consent of instructor, 160A and 160B may be taken out of their normal sequence in either semester. Enrollment limited by laboratory facilities.  
 A study of pattern beyond the single unit of design, executed in various media.
166. Principles of Three-dimensional Abstract Design. (3) I and II. Mr. Rosenquist  
 Enrollment limited by laboratory facilities.  
 Prerequisite: some advanced design experience and consent of instructor.  
 Basic elements of three-dimensional space from low relief to full round and mobile forms. Laboratory problems executed in simple techniques.
167. Sources of Industrial Design. (2) II. Mr. French  
 Thought and effort important to the development of machine art from its inception during the Industrial Revolution.
- 175A-175B. Primitive and Folk Textiles. (2-2) Yr. Miss Gayton  
 Textile arts in their historical and cultural settings.  
 175A. Native America; Oceania; Indonesia.  
 175B. Egypt; Persia; Peasant, Medieval, and Renaissance Europe.  
 Either half of this course may be taken independently.
- 176A-176B. Textile Design. (2-2) Yr. Mrs. Miller, Mr. Rossbach  
 176A: I and II, 176B: II.  
 Enrollment limited by laboratory facilities; preference given to students majoring in decorative art.  
 Prerequisite: courses 6A-6B, 7A-7B, and 175A or 175B. Course 175A or 175B may be taken concurrently.  
 Analyses, reconstructions, and experiments on the loom, emphasizing design, color, and texture.
179. Textile Analysis. (2) II. Miss Gayton  
 Prerequisite: courses 175A, 176A-176B, and consent of instructor.  
 Enrollment limited by laboratory facilities; preference will be given to students majoring in decorative art.
- \*180A-180B. Survey of Expression in Materials. (3-3) Yr. Mr. Wellington  
 A study of form as exemplified by significant objects made from metals, wood, glass, clay, etc. Either half of this course may be taken independently. Offered every other year.
- 193A-193B. Historic Costume. (3-3) Yr. Miss Gayton  
 Costumes of various times and places with reference to design, material, cultural factors, and contemporary arts.  
 193A. Native America; Indonesia; Asia.  
 193B. Classic Mediterranean; Medieval to Modern Europe.  
 Either half of this course may be taken independently.
- 195A. The Great Periods in Interior Design. (3) I. Miss Gladding  
 The study of the periods as applied to domestic interiors.
- 195B. American Decorative Art from the First Colonial Periods to 1850. Miss Gladding  
 (3) II.  
 Spanish, English, Dutch Colonial Periods, and the Federal Period. Lec-

\* Not to be given, 1954-1955.

tures, with slides, from material in museum collections and private houses showing the work of the more significant artists, housewrights, and craftsmen.

†196A-196B. Interior Design. (2-2) Yr. Beginning each semester.

Offered every other year.

Mr. Wellington

Prerequisite: courses 6A-6B, 7A-7B, 130A-130B, 195A, and some mechanical drawing. 196A is prerequisite to 196B.

Periods of individual criticism and discussion of theory involved. Drawn problems.

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

The Staff (Mr. Rossbach in charge)

Prerequisite: senior standing in decorative art and a B average or higher in major courses. Candidates for the master's degree will be expected to consult with the graduate adviser concerning specific requirements.

#### GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Seminars in Decorative Art.

The Staff

294A. American Decorative Art. (2) II.

Miss Gladding

\*294B. Textiles. (2) II.

Miss Gayton

Studies based upon textiles in the collections of the Department of Decorative Art and in the Museum of Anthropology.

294C. Decorative Motifs in Oriental Art. (2) I.

Mr. Wellington

294D. Components of Costume. (2) I.

Miss Gayton

294E. Form in Primitive Art. (2) II.

Miss Nelson

Studies in form and style based upon selected material from the collections of the Museum of Anthropology.

\*294F. Industrial Design. (2) I.

Mr. French

Analytic and critical studies of selected phases of industrial design.

299. Directed Research. (2-4) I and II.

The Staff (Miss Gladding in charge)

## DRAMATIC ART

(Department Office, 1205 Dwinelle Hall)

Fred O. Harris, M.F.A., *Professor of Dramatic Art (Chairman of the Department)*.

Leslie J. Mahoney, M.A., *Assistant Professor of Dramatic Art*.

Seth Powers Ulman, Ph.D., *Assistant Professor of Dramatic Art*.

Hubert S. White, Jr., A.B., *Assistant Professor of Dramatic Art*.

Theodore L. Kazanoff, M.A., *Instructor in Dramatic Art*.

William F. Rothwell, Jr., Ph.D., *Instructor in Dramatic Art*.

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List, except the following: courses 190, 191, 192, and 193. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Harris.

\* Not to be given, 1954-1955.

† To be given fall semester, 1954; not to be given spring semester, 1955.

*Preparation for the Major.*—Required: course 10A–10B (3–3), Theory of Acting.

*The Major.*—Required: 24 units of upper division courses including 15 units in dramatic art, with not more than 6 units of Dramatic Art 190, 191, 192, 193, and 9 units in dramatic literature, history of drama, and history of theater. In addition, students will be required to complete 6 units of supervised laboratory work in the University Theater without credit. The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department.

(A) Dramatic Art courses: Theory. Courses 130A, 130B, 130C, 130D (3–3–3), not more than 6 units of which will apply to the major. Courses 120 (3), 135 (3), 152A–152B (3–3), 160A–160B (3–3).

(B) Dramatic Art courses: Practice. Courses 190, 191, 192, 193, not more than 6 units of which will apply to the major.

(C) Courses in Dramatic Literature, History of Drama, and History of Theater: Courses 140A–140B (3–3), English 114A–114B (3–3), 117A–117B (3–3), 117E (3), Classics 103 (3), 108 (3), Spanish 105 (3), 109A–109B (2–2), 111A–111B (2–2), French 115A–115B (2–2), 120A–120B (2–2), German 104 (3), 106 (3), 109 (3), Italian 100 (3), Scandinavian 106 (3), 107 (3), Slavic 135 (2).

(D) Recommended Courses: Lower Division: Classics 34 (2), 35 (2), English 1A–1B (3–3), Music 27A–27B (3–3), Speech 2A–2B (3–3). Upper Division: Classics 178 (2), Philosophy 136A–136B (3–3), course 407 (3).

#### The University Theater

Under the direction of the Department of Dramatic Art, the University Theater presents a major and a studio series of play productions. These presentations have a twofold purpose: (1) to present to the University community a program of distinguished dramas of all times and all countries; (2) to afford the students in the University an effective experience in dramatic art. Participation in the presentations is open to all students.

The studio theater in Dwinelle Hall provides facilities for an extensive and varied program of student experiments in acting, playwriting, and directing.

#### LOWER DIVISION COURSE

10A–10B. Theory of Acting. (3–3) Yr. Beginning each semester.

Mr. Harris, Mr. Kazanoff, Mr. Mahoney

#### UPPER DIVISION COURSES

##### Group A. Dramatic Art: Theory and Practice

Not more than 6 units from courses 190, 191, 192, and 193 will be credited toward the major.

120. Theory of Stage Design. (3) I and II.

Mr. Rothwell

130. Advanced Theory of Acting. (3)

Mr. Kazanoff, Mr. Mahoney, Mr. Ulman

Prerequisite: course 10A–10B, and consent of instructor.

130A. Greek Drama. (3) II.

Mr. Ulman

130B. Shakespearean Drama. (3) I.

Mr. Ulman

130C. Seventeenth- and Eighteenth-Century Drama. (3) II.

Mr. Mahoney

130D. Modern Drama. (3) I.

Mr. Kazanoff

135. Theory of Directing. (3) I and II.

Mr. Harris

- 152A-152B. Creative Playwriting. (3-3) Yr. Beginning each semester.  
Mr. White  
Prerequisite: upper division standing and consent of instructor.
- 160A-160B. Dramatic Theory. (3-3) Yr. Mr. Ulman  
160A is not prerequisite to 160B.
190. Laboratory Projects in Acting. (1-6) I and II.  
The Staff (Mr. Mahoney in charge)  
Prerequisite: courses 10A-10B, 407, and consent of the department.
191. Laboratory Projects in Directing. (1-6) I and II.  
Mr. Harris (in charge)  
Prerequisite: courses 10A-10B, 120, 135, 407, and consent of instructor.
192. Laboratory Projects in Stagecrafts. (1-6) I and II.  
The Staff (Mr. Harris in charge)  
Prerequisite: courses 10A-10B, 120, and consent of the department.
193. Laboratory Projects in Playwriting. (1-6) I and II. Mr. White  
Prerequisite: course 152A-152B and consent of instructor.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Harris in charge)
407. Speech for the Stage. (3) I and II. Mr. Mahoney  
Prerequisite: course 10A-10B, and consent of instructor.

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

The attention of the student is directed to the Group Major in Dramatic Literature described in the CIRCULAR OF INFORMATION.

#### UPPER DIVISION COURSES

- 140A-140B. The Theater in Western Civilization. (3-3) Yr. Mr. Rothwell  
140A is not prerequisite to 140B.

#### RELATED COURSES IN OTHER DEPARTMENTS

- Classics 35. Greek Tragedy. (2) I.  
(Given in English.)
- \*Classics 135. Greek and Roman Comedy. (2) II.  
(Given in English.)
- English 114A-114B. The English Drama. (3-3) Yr.  
English 117A-117B. Shakespeare. (3-3) Yr.  
English 117E. Shakespeare. (3) I.  
French 115A-115B. Modern French Drama. (2-2) Yr.  
French 120A-120B. The Seventeenth Century. (2-2) Yr.  
Greek 103. Drama. (3) II.  
German 104. Dramas of the Nineteenth Century. (3) II.  
German 106. Schiller's Dramas. (3) I.  
German 109. Goethe's Verse Dramas. (3) II.  
\*Italian 100. Survey of Modern Drama from Goldoni to the Present. (3) II.  
Latin 108. Roman Comedy. (3) I.  
Scandinavian 106. History of Scandinavian Drama. (3) I.  
(Given in English.)  
Scandinavian 107. The Plays of Ibsen. (3) II.  
(Given in English.)

\* Not to be given, 1954-1955.



Scandinavian 109. Scandinavian Drama of the Twentieth Century. (3) II.

\*Slavic 135. The Russian Drama. (2) I.

(Given in English.)

Spanish 105. Modern Peninsular Drama: From the Romantic Movement to the Present. (3) I.

\*Spanish 109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries. (2-2) Yr.

Spanish 111A-111B. Cervantes. (2-2) Yr.

## ECONOMICS

(Department Office, 119 South Hall)

Joe S. Bain, Jr., Ph.D., *Professor of Economics.*

Robert A. Brady, Ph.D., *Professor of Economics.*

Norman S. Buchanan, Ph.D., *Professor of Economics.*

John B. Condliffe, Sc.D., LL.D., *Professor of Economics.*

Malcolm M. Davison, J.D., Ph.D., *Professor of Economics.*

\*Howard S. Ellis, Ph.D., LL.D., *Flood Professor of Economics.*

Robert A. Gordon, Ph.D., *Professor of Economics.*

Ewald T. Grether, Ph.D., LL.D., *Flood Professor of Economics.*

Charles A. Gulick, Ph.D., *Professor of Economics.*

Emily H. Huntington, Ph.D., *Professor of Economics.*

Frank L. Kidner, Ph.D., *Professor of Economics.*

Carl Landauer, Ph.D., *Professor of Economics.*

Sanford A. Mosk, Ph.D., *Professor of Economics.*

Paul S. Taylor, Ph.D., *Professor of Economics (Chairman of the Department).*

Ira B. Cross, Ph.D., LL.D., *Flood Professor of Economics, Emeritus.*

Stuart Daggett, Ph.D., *Flood Professor of Transportation, Emeritus.*

Melvin M. Knight, Ph.D., *Professor of Economics, Emeritus.*

Lucy W. Stebbins, A.B., Litt.D., *Professor of Social Economics, Emeritus*

Robert Dorfman, Ph.D., *Associate Professor of Economics.*

Earl R. Rolph, Ph.D., *Associate Professor of Economics.*

George F. Break, Ph.D., *Assistant Professor of Economics.*

Gregory Grossman, Ph.D., *Assistant Professor of Economics.*

Forest G. Hill, Ph.D., *Assistant Professor of Economics.*

† Donald R. Hodgman, Ph.D., *Assistant Professor of Economics.*

† Harvey Leibenstein, Ph.D., *Assistant Professor of Economics.*

John M. Letiche, Ph.D., *Assistant Professor of Economics.*

Jelle C. Riemersma, M.A., *Acting Assistant Professor of Economics.*

Peter O. Steiner, Ph.D., *Assistant Professor of Economics.*

† Michael Gort, Ph.D., *Instructor in Economics.*

Denis A. Flagg, Ph.D., *Associate in Economics.*

Robert M. Robinson, Ph.D., *Associate in Economics.*



David A. Alhadeff, Ph.D., *Assistant Professor of Business Administration.*

Choh-Ming Li, Ph.D., *Associate Professor of Business Administration.*

\* Not to be given, 1954-1955.

† Absent on leave, 1954-1955.

‡ Sabbatical leave in residence, fall semester, 1954-1955.

§ In residence spring semester only, 1954-1955.

**Upper Division Prerequisites.**—For students with a major in economics, courses 1A-1B and 2 are prerequisite to all upper division work in the department unless otherwise specified. For students not majoring in economics, course 1A-1B and junior standing are prerequisite to all upper division work in the department, except where Economics 2 is listed as a specific prerequisite.

**Letters and Science List.**—All undergraduate courses in economics are included in the Letters and Science List. For regulations governing this list, see page 7.

**Departmental Major Advisers.**—Mr. Hill, Chairman; Mr. Break, Mr. Grossman, Mr. Hodgman, Mr. Robinson, Mr. Rolph.

**Preparation for the Major.**—Required: courses 1A-1B and 2, and a minimum average grade of C in these courses. Recommended: course 10, Business Administration 1A-1B, and at least an introductory course in another social science (6 units in political science, history, or sociology and social institutions preferred). It is recommended that students who intend to make economics their major complete courses 1A-1B and 2 by the end of their sophomore year.

**The Major.**—Required: 24 units of upper division economics. Courses 100A-100B (6); 110, 112, or 113 (3); and 135 (3) are required and should be taken in the junior year. (Course 135 should be taken before course 100B.) The remaining 12 units shall be selected by the student with the advice and approval of a departmental major adviser. The selection shall contain at least one two-semester sequence of courses, in order to ensure that each student shall have a significant degree of emphasis and depth in a particular field beyond the introductory semester. A course (3 units) in another department may be included among the 12 units, if it is approved by the Chairman of the Major Advisers' Committee as appropriate to the student's program.

It is strongly recommended that each student elect upper division courses in other related social sciences. Except under extraordinary circumstances, no more than 9 units of economics and business administration combined may be taken in one semester.

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 satisfaction of the major requirement. Students who do not maintain a C average may be required at any time to withdraw from the major in economics.

Economics majors on the Honors List of the College of Letters and Science are encouraged to enroll in course 199 for special study, or to ask admission to a graduate course (with permission of the instructor concerned) during their senior year.

#### LOWER DIVISION COURSES

1A-1B. Elements of Economics. (3-3) Yr. Beginning each semester.

Mr. Flagg, Mr. Gordon, Mr. Grossman, Mr. Kidner, Mr. Robinson  
Prerequisite: 1A is prerequisite to 1B.

Two lectures; one weekly recitation section to be arranged.

2. Economic Statistics. (3) I and II. Mr. Break, Mr. Flagg, Mr. Steiner

Non-mathematical introduction to modern methods of analyzing numerical data, including descriptive statistics, sampling and statistical inference, index numbers, correlation, and time series. Emphasis is on the logic of procedures, interpretation, and application. Illustrative material from economics and business. Open to any student with two years of high school algebra or one year of high school algebra and Mathematics D.

Credit is limited to 2 units for students who have received credit for Education 114 or Psychology 5.

10. Economic History. (3) I and II. Mr. Hill  
 Survey of the development of the economic institutions of the Western World.

## UPPER DIVISION COURSES

Primarily for undergraduates. Prerequisite for major students in economics; courses 1A-1B, 2, and junior standing; for others, 1A-1B and junior standing except where course 2 is prerequisite for a specific course.

- 100A-100B. Economic Theory. (3-3) Yr. Beginning each semester.  
 Mr. Bain, Mr. Grossman, Mr. Flagg, Mr. Hill,  
 Mr. Hodgman, Mr. Letiche
- 100A is not open to students taking Business Administration 100;  
 100B is not open to students taking Business Administration 101. It is recommended that this course be taken in the junior year.
- Study of the economic process with special reference to the theory of general equilibrium, particular equilibrium, imperfect competition, and economic fluctuations.
- 101A-101B. History of Economic Doctrine. (3-3) Yr. Mr. Brady
- \*102. Advanced Economic Theory. (3) I. \_\_\_\_\_  
 Prerequisite: course 100A-100B.  
 Analysis of the determinants of the aggregate level of output and employment, and of the allocation of resources. Includes advanced value and distribution theory, and a brief review of modern monetary theory.
104. Economic Policy. (3) I and II. Mr. Buchanan, Mr. Landauer  
 I: Mr. Buchanan; II: Mr. Landauer.  
 Open to all qualified upper division students with consent of instructor.  
 Primarily for non-majors in economics.
105. Economics of Consumption. (3) I. Miss Huntington  
 A general survey of consumption in the United States, with an analysis of the determination of consumer demands, and of the relation of the consumer to the price systems.
- 106A-106B. Social Reform Movements. (3-3) Yr. Mr. Landauer  
 106A. European and American movements for social reform prior to 1914.  
 106B. European and American movements for social reform since 1914.
110. Economic History since 1850. (3) I. Mr. Riemersma  
 The unequal stages of development, resource bases, and population, and rates of industrialization, between the more- and less-developed areas of the world, including "Colonialism," and the "development of under-developed areas."
112. Economic History of Europe. (3) I and II. Mr. Grossman
113. Economic History of the United States. (3) I and II. Mr. Mosk
114. Economic Problems of Latin America. (3) I and II. Mr. Mosk
115. Economic Problems of the Far East. (3) I and II. Mr. Li
- 117A-117B. Problems of Economic Planning. (3-3) Yr. Mr. Brady  
 117A. General theory of economic planning.  
 117B. Comparative study of economic planning in different countries.

\* Not to be given, 1954-1955.

118. Economic Problems of Soviet Russia. (3) I and II.  
 I: Mr. Hodgman; II: Mr. Grossman. Mr. Grossman, Mr. Hodgman  
 The Soviet economic inheritance and economic developments in Soviet  
 Russia from 1917 to the present; Soviet agriculture, industry, trade, labor,  
 planning, financial and price systems; analysis of the role of wages, prices,  
 interest, profit, and investment in the Soviet economic system.
- \*119. Economic Problems of Africa. (3) II. \_\_\_\_\_
- 121A-121B. Industrial Organization. (3-3) Yr. Mr. Bain  
 The organization and structure of industries and their markets in the  
 American economy, competitive behavior, price policy, and market per-  
 formance in such industries; public policy in the regulation of industry.
- \*122. Theory of Domestic Trade. (3) II. \_\_\_\_\_  
 Primarily for seniors.  
 Prerequisite: course 100A, Business Administration 100, or their equiv-  
 alent.  
 The theory of interregional and intraregional movements of trade; the  
 nature of competition in the channels of distribution; an evaluation of  
 the economic consequences of selected marketing activities; the regulation  
 of trade.
- \*125. Economics of Regulation and Control. (3) I and II. \_\_\_\_\_  
 The role of government in the regulated sectors of the American econ-  
 omy; economic criteria for efficient control of prices, production, and the  
 flow of investment funds.
- 130A-130B-130C. Public Finance and Taxation. (3-3-3) Yr.  
 Mr. Davisson, Mr. Rolph  
 130A. I and II: Mr. Davisson. A general survey of the growth and  
 economic effects of public expenditure and public indebtedness, the char-  
 acter of taxation, and tax problems (federal, state and local) of the  
 United States. •  
 130B. II: Mr. Rolph. Examination of tax problems with principal  
 reference to the federal government.  
 130C. II: Mr. Davisson. Examination of tax problems with principal  
 reference to state and local governments. Prerequisite: course 130A.
- \*133. Dynamic Economics and Business Fluctuations. (3) I. \_\_\_\_\_  
 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 and II.  
 Mr. Alhadeff, Mr. Break, Mr. Hodgman, Mr. Kidner  
 Primarily for juniors.  
 Monetary and banking institutions; monetary theory, international  
 monetary relations, monetary policy.
137. Money, Banking and Monetary Policy. (3) II. Mr. Ellis  
 Prerequisite: course 135.  
 Analysis of the monetary system of the United States and of other  
 countries; problems involved in monetary management, evaluation of pro-  
 grams for monetary and banking reform.
142. Economic Statistics. (3) I. Mr. Flagg  
 Prerequisite: course 2 or equivalent.

\* Not to be given, 1954-1955.

150. Labor Economics. (3) I and II. Mr. Robinson, Mr. Gulick  
I: Mr. Robinson; II: Mr. Gulick.  
The social background of labor legislation and trade unionism.  
Students will not receive credit for both course 150 and Business Administration 150.
152. Labor Economics. (3) I. Mr. Gulick  
Comparative survey of American and foreign labor movements.
180. Problems of Poverty. (3) I. Miss Huntington  
Facts, conditions, and current explanations of poverty; public and private action to prevent destitution; theories concerning minimum standards of living.
185. Social Insurance. (3) II. Miss Huntington  
An analysis of the theories underlying social insurance and social insurance legislation throughout the world.
- \*188A-188B. Population and Migration. (3-3) Yr. \_\_\_\_\_  
188A. Social and economic consequences of population change, with special reference to economic opportunities, employment, investment, and problems of international trade; population trends, theories, and problems, methods of population measurement and population forecasting.  
188B. Population and migration problems in economic development.
- 190A-190B. International Economic Relations. (3-3) Yr. Beginning each semester. Mr. Condliffe, Mr. Letiche  
190A. I: Mr. Condliffe; II: Mr. Letiche.  
190B. I: Mr. Letiche; II: Mr. Condliffe.  
Fundamental factors in international economic relations.
197. Problems in International Economic Relations. (3) II. Mr. Letiche  
Prerequisite: course 190A-190B.  
Research in problems of international economic policy for advanced undergraduate students.
198. Directed Group Study for Advanced Undergraduates. (3) II. Mr. Grossman  
Primarily for students on the Honors List of the College of Letters and Science.  
Prerequisite: consent of instructor.  
Designed to afford opportunity for seminar-type instruction and individual research. Topics to be decided upon at the beginning of the course.
199. Special Study for Advanced Undergraduates. (1-3) I and II. Mr. Grossman  
Designed primarily for seniors on the Honor List of the College of Letters and Science.

## GRADUATE COURSES

Admission to graduate courses requires, in all cases, the consent of the instructor. Undergraduate courses are not prerequisite to graduate courses, except where indicated.

- 200A-200B. Fundamentals of Economic Theory. (3-3) Yr. Mr. Dorfman, Mr. Rolph, Mr. Steiner  
National income analysis, macro-economics; demand and cost theory; income distribution; theory of employment.  
200A. I: Mr. Dorfman, Mr. Rolph, Mr. Steiner.  
200B. II: Mr. Dorfman, Mr. Rolph.

\* Not to be given, 1954-1955.

- 201A-201B. History of Economic Thought. (3-3) Yr. Mr. Letiche  
 Analysis of the classical system of value and distribution theory; neo-classical thought; contributions of eclectics, socialists, and institutionalists.
- \*202. Seminar in Welfare Economics. (3) II. \_\_\_\_\_  
 Prerequisite: course 200A-200B.  
 Consideration of welfare economics and related theoretical topics.
- \*204A-204B. Advanced Theory of Interest, Capital, and Employment. (3-3) Yr. \_\_\_\_\_  
 Prerequisite: course 200A-200B.
205. Theory of Economic Change and Development. (3) II. Mr. Hill  
 Theory of economic change; relation of such theories to general economic theory. Institutional patterns of development; changes in resource and product composition.
- 206A-206B. Social Reform Movements. (3-3) Yr. Mr. Landauer
207. Mathematical Methods of Economics. (3) II. Mr. Dorfman  
 The study of theoretical economics with reference to methods of mathematical formulations.
210. Seminar in Economic History. (3) II. Mr. Riemersma  
 Prerequisite: course 212A-212B.  
 Advanced investigation of special topics in economic history.
- 212A-212B. European Economic History. (3-3) Yr. Mr. Riemersma
213. American Economic History. (3) II. Mr. Mosk
- 217A-\*217B. Problems in Economic Planning. (3-3) Yr. Mr. Brady  
 217A. General theory of economic planning.  
 217B. Study of economic planning in different countries.
218. Seminar on the Soviet Economy. (3) II. Mr. Grossman  
 Population and labor force, national income, investment, structure of the economy, financial system, prices, planning. Problems in research and analysis.
- 221A-221B. Industrial Organization. (3-3) Yr. Mr. Bain  
 The organization and structure of the American enterprise economy, with special reference to manufacturing and processing industries. Competitive behavior, price policy, and workability of competition in such industries.
- 230A-230B. Public Finance. (3-3) Yr. Mr. Rolph, Mr. Break  
 I: Mr. Rolph; II: Mr. Break.  
 Public finance and taxation theory; public debt and fiscal policy; public policy with respect to taxation.
- 233A-233B. Dynamic Economics and Business Fluctuations. (3-3) Yr. Mr. Gordon
- \*234. Business Conditions, Domestic and Foreign. (3) II. \_\_\_\_\_  
 Prerequisite: course 233A-233B, or consent of instructor.  
 A seminar involving practice in analyzing business conditions in the United States and reviewing recent developments in foreign countries.
- 235A-235B. Advanced Money and Banking. (3-3) Yr.  
 I: Mr. Kidner; II: Mr. Ellis. Mr. Ellis, Mr. Kidner  
 Analysis of banking institutions and money, monetary theory, and monetary policy.

- \*236. Seminar in Monetary and Fiscal Theory, and Policy. (3) II. ———  
Prerequisite: course 233A-233B, 235A-235B, or 230A-230B.  
Analysis of fiscal monetary devices under varying conditions with particular reference to the United States and Western Europe.
- \*238. Theory and Measurement of the National Income. (3) II. ———  
Prerequisite: courses 2 and 100A-100B. Recommended: some knowledge of accounting.  
Survey of the theory underlying alternative methods of measurement and review of the methods used in the United States and other countries.
- 240A-240B. Advanced Economic Statistics. (3-3) Yr. Mr. Break  
240A. Statistical theory as applied to economics.  
240B. Application of statistical techniques.
241. Statistical Methods of Social Investigation. (3) II. Miss Huntington
- 250A-\*250B. Advanced Labor Economics. (3-3) Yr. Mr. Gulick  
Prerequisite: two courses in labor, including some European labor history, and consent of instructor. Course 250A is not prerequisite to 250B.  
An intensive reading course covering classic and current material.
- \*252A-252B. Seminar in Labor Economics. (3-3) Yr. ———
- 254A-254B. Seminar in Agricultural Labor. (3-3) Yr. Mr. Taylor  
Prerequisite: consent of instructor.  
Agricultural workers of wage and lower-tenure status, in advanced and underdeveloped countries, including such aspects as status, collective bargaining, social legislation, land reform, productivity, impact of mechanization, and role in politics.
- 290A-290B. International Economics. (3-3) Yr. Mr. Buchanan  
Partial, general, and equilibrium theories of international trade, gains from trade; theory of tariffs. Commercial policies of various countries, international agreements, state trade, and international monetary institutions.
291. Research in International Economic Relations. (3) I and II.  
Open to graduate students in any department. Mr. Condliffe  
Research on current problems of international economic interest.
- \*292. International Finance. (3) I. ———  
Balance of payments analysis; national and international currencies; variations of exchange rates, prices and national incomes and international equilibrium; capital movements and investments; exchange controls, international payment systems and institutions; United States foreign policy.
293. Economic Development and Industrialization. (3) II. Mr. Buchanan  
Prerequisite: course 290A-290B or consent of instructor.  
Problems of capital accumulation, foreign borrowing, saving, inflation, patterns of industry, economic development and trade, improved efficiency in labor and land utilization, etc., in relation to deliberate development efforts in low income areas.
298. Research. (1-6) I and II. Mr. Davisson (in charge)  
Open to candidates for the Ph.D. degree who have passed the qualifying examination and who are engaged in research for the thesis, and in special cases, with consent of the instructor in charge, to graduate students who desire to do special work in a particular field.

\* Not to be given, 1954-1955.

## EDUCATION

(Department Office, 207 Haviland Hall)

William A. Brownell, Ph.D., LL.D., *Professor of Education (Chairman of the Department.)*

Guy T. Buswell, Ph.D., LL.D., *Professor of Education.*

Harold D. Carter, Ph.D., *Professor of Education.*

Luther C. Gilbert, Ph.D., *Professor of Education.*

George C. Kyte, Ed.D., *Professor of Education.*

Thomas R. McConnell, Ph.D., LL.D., D.H.L., *Professor of Education.*

†John U. Michaelis, Ph.D., *Professor of Education.*

Edgar L. Morphet, Ph.D., *Professor of Education.*

J. Cecil Parker, Ed.D., *Professor of Education.*

†Theodore L. Reller, Ph.D., *Professor of Education.*

David H. Russell, Ph.D., *Professor of Education.*

†Frederick T. Tyler, Ph.D., *Professor of Education, Department Executive Officer.*

Edna W. Bailey, Ph.D., *Professor of Education and Associate Director of Supervised Teaching, Emeritus.*

Frank N. Freeman, Ph.D., LL.D., D.Sc., *Professor of Educational Psychology, Emeritus.*

Frank W. Hart, Ph.D., LL.D., *Professor of Education, Emeritus.*

Merton E. Hill, Ed.D., *Professor of Education, Emeritus.*

George A. Rice, Ed.D., *Professor of Education, Emeritus, and Director of Supervised Teaching, Emeritus.*

Lester A. Williams, Pd.D., *Professor of Education, Emeritus.*

Lars H. Peterson, Ph.D., *Associate Professor of Education, Emeritus.*

Glenn E. Barnett, Ed.D., *Associate Professor of Education and Director of the University Elementary School.*

Howard S. Bretsch, Ph.D., *Associate Professor of Education.*

Bertrand Evans, Ph.D., *Associate Professor of English and Education.*

Clifford P. Froehlich, Ed.D., *Associate Professor of Education.*

Jack A. Holmes, Ph.D., *Associate Professor of Education.*

Mary C. Jones, Ph.D., *Associate Professor of Education.*

Frederic Lilge, Ph.D., *Associate Professor of Education.*

†S. E. Torsten Lund, Ph.D., *Associate Professor of Education.*

Thomas Bentley Edwards, Ph.D., *Assistant Professor of Education.*

Walter D. Loban, Ph.D., *Assistant Professor of Education and Supervisor of the Teaching of English.*

Jack London, Ph.D., *Assistant Professor of Education.*

Richard D. Mosier, Ph.D., *Assistant Professor of Education.*

Lawrence H. Stewart, Ed.D., *Assistant Professor of Education.*



Dan Cappa, Ph.D., *Visiting Associate Professor of Education.*

Clinton C. Conrad, Ph.D., *Lecturer in Education and Director of Supervised Teaching.*

Enoch Dumas, Ed.D., *Lecturer in Education, Associate Director of Supervised Teaching, and Supervisor of Elementary Education.*

† Absent on leave, 1954-1955.

‡ Sabbatical leave in residence, 1954-1955.



- Laurence F. Foster, Ph.D., *Lecturer in Education and Supervisor of Audio-Visual Education.*
- John E. French, Ph.D., *Supervisor of Art Education in the Elementary School and Assistant Professor of Decorative Art.*
- Mabel F. Gifford, A.B., *Lecturer in Education for the spring semester.*
- Margaret B. Hanson, M.A., *Lecturer in Education and Supervisor of the Teaching of Home Economics and Associate in Home Management.*
- M. Ray Hitch, M.A., *Lecturer in Education and Supervisor of the Teaching of Business Education.*
- Barbara Kirk, M.A., *Lecturer in Education.*
- George H. Kyme, Ph.D., *Associate in Music and Supervisor of the Teaching of Music.*
- Gail E. Moore, M.Ed., *Lecturer in Education for the fall semester.*
- Heber A. Newsom, M.A., *Supervisor of Physical Education and Supervisor of the Teaching of Physical Education for Boys.*
- Herman A. Spindt, Ph.D., *Lecturer in Education.*
- David VanderSlice, M.D., *Lecturer in Education.*



- Marion Avery, A.B., *Supervisor of the Teaching of Physical Education for Girls.*
- Donetta C. Brainard, A.B., *Assistant Supervisor of the Teaching of English.*
- Robert E. Brownlee, A.B., *Resident Supervisor, Oakland Technical High School.*
- George J. Burkhard, M.A., *Principal of the University Elementary School.*
- \*Marilyn H. Cutright, M.A., *Supervisor of Elementary Education.*
- Ruby L. Hill, M.A., *Assistant Supervisor of Elementary Education.*
- James W. Hoge, M.A., *Supervisor of the Teaching of Mathematics.*
- Katharyn Hole, *Supervisor of the Teaching of Art.*
- Margaret C. Jackson, M.A., *Assistant Supervisor of the Teaching of Social Studies.*
- Lena S. Jaggard, A.B., *Supervisor of the Teaching of Social Studies.*
- Anne F. Merrill, M.A., *Elementary Supervisor.*
- Adele Ogden, Ph.D., *Supervisor of the Teaching of Social Studies.*
- Arnold R. Pagano, A.B., *Supervisor of Elementary Education.*
- T. Clyde Polson, Ph.D., *Supervisor of the Teaching of Science.*
- Margaret Ryan, M.A., *Supervisor of the Teaching of English and Speech.*
- Karl E. Schevill, Ph.D., *Supervisor of the Teaching of Foreign Languages.*
- James R. Squire, M.A., *Supervisor of the Teaching of English.*
- Josie W. Stewart, M.A., *Supervisor of the Teaching of Kindergarten Work.*
- Olive Stewart, M.S., *Supervisor of the Teaching of Social Studies.*
- V. Elaine Stoeckle, A.B., *Supervisor of Elementary Education.*
- Portia F. Wagenet, A.B., *Supervisor of the Teaching of Physical Education for Girls.*
- Rosalie V. Zari, M.A., *Supervisor of Junior High School and Elementary Education.*

*Letters and Science List.*—Courses 108, 110, and not more than 3 units from 101, 102, and 105 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Brownell and Mr. Bretsch.

\* Absent on leave, 1954-1955.

*Preparation for the Major.*—Psychology 1A and Zoölogy 10, and not less than 6 units in economics (preferably 1A-1B) or political science (preferably 1, 2) or sociology and social institutions (preferably 100A-100B) or philosophy (preferably 6A-6B).

*The Major.*—The major here described is the 24-unit major for the A.B. degree in the College of Letters and Science. *A major in education is not an acceptable major for a Certificate of Completion of the teacher-training curricula.*

Required: 18 units in education including the following 11 units: Education 101, 106, 110, 119, and a sequence of courses consisting of one of the following groups with additional courses from the remaining groups sufficient to make a total of 7 units.

- I. History of Education, courses 102; 105.
- II. Educational Psychology, courses 111; 115 or 116 or 117 or 118.
- III. Elementary Education: courses 130; 134; 138.
- IV. Vocational Education: courses 160; 161 or 162; 164.
- V. Secondary Education: courses 170; 117 or 172.
- VI. Social Education: course 111.

The remaining 6 units may be chosen, with the approval of the department, from upper division courses in the Letters and Science List in the following departments: Economics, Education, History, Philosophy, Political Science, Psychology, or Zoölogy. Students who transfer from normal schools or teachers colleges will not be permitted to elect courses in education for these 6 units. It is recommended that students include Philosophy 104 in the major program. Courses numbered in the 300 series are not accepted toward the major for the A.B. degree.

The department will certify to the completion of a major for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain this average may be required at any time to withdraw from the major in education.

#### TEACHER-TRAINING CURRICULA

Special provision is made for the professional training of teachers of two classes:

A. Those preparing to become teachers in elementary and secondary schools or in colleges.

B. Those preparing to engage in school administration or supervision, to become principals or superintendents of public schools, or to teach in teachers colleges or in college departments of education.

For detailed requirements see ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

For courses offered at Davis see GENERAL CATALOGUE, DAVIS CAMPUS.

#### UPPER DIVISION COURSES

Prerequisite: junior standing and Psychology 1A or equivalent.

101. The History of Education—General Course. (3) I and II. Mr. Mosier  
The development of educational thought and practice viewed as a phase of social progress.

\*102. The History of American Education. (2) I. Mr. Mosier  
The leading ideas and ideals of American education and the institutions in which they have been embodied.

\* Not to be given, 1954-1955.

105. Education in Foreign Countries. (2) II. Mr. Lilge  
Education as an instrument of political power and propaganda; its dependence on national cultural traditions. Especially valuable to students pursuing the study of a specific region.
106. Philosophy of Education. (2) I and II. Mr. Lilge  
The great educational classics and their meaning for modern man.
- \*108. Universities in the Modern World. (2) I. \_\_\_\_\_  
Various ideas of a university and their implications for general education, professional training and social service; philosophical and comparative analysis.
110. Introduction to Educational Psychology. (3) I and II. Mr. Buswell, Mr. Carter, Mr. Gilbert, Mr. Holmes  
Original nature and tendencies of man; the learning process; individual differences and their measurement.
111. Growth and Development of Children. (2) I and II. Mrs. Jones  
Prerequisite: course 110.  
The processes through which the normal human being reaches maturity, acquires effective use of his bodily equipment and learning capacity, and makes satisfactory personal and social adjustments. Directed observation of normal children.
112. The Improvement of Reading in Schools. (2) I. Mr. Buswell  
Psychology of learning as it relates to effective reading readiness programs, development of word meaning, organization and analysis, improvement of comprehension, recall, skimming and speed reading, study skills and higher mental processes, provision for individual differences in ability and interest, place of skills in modern reading program.
114. Statistical Methods in Education. (2) I. Mr. Carter  
Prerequisite: course 110. Mathematics D is also recommended.
- \*115. Objective Tests and Measurements. (2) I. Mr. Carter  
Prerequisite: course 110 or equivalent, and 114.  
Principles and functions of measurement in education; varieties of measurement in common use; the construction and validation of objective examinations; the improvement of school marks.
116. The Exceptional Child. (2) I. Mr. Holmes  
Prerequisite: course 110 or a course in psychology additional to Psychology 1A.
117. Psychology of High School Subjects. (2) I and II. Mr. Gilbert  
Prerequisite: course 110.  
A psychological analysis of the various subjects of the high school curriculum with a survey of psychological experiments.
119. Standard Tests in Education. (3) II. Mr. Carter  
A critical survey and evaluation of standard tests, including achievement and psychological tests available for school purposes; practice in giving and scoring tests, and interpreting results for the improvement of instruction; organization of a testing program.
- \*127. Principles of Teaching the Slow Learner. (2) II. Mr. Holmes  
Prerequisite: teaching experience.  
Principles of adapting the curriculum, materials, and methods of teaching to the needs of the mentally handicapped child. This course may be counted toward the special credential for working with mentally retarded children.

---

\* Not to be given, 1954-1955.

130. Elementary Education. (3) I and II. Mr. Barnett, Mr. Cappa  
Prerequisite: course 110 (may be taken concurrently).  
Limited to candidates for the elementary teaching credential, for the general administrative credential, and for the doctor's degree.
131. Arithmetic and Language in the Elementary School. (2) I. Mr. Dumas  
Prerequisite: courses 110 and 130.  
Objectives, standards of attainment, and types of instruction in arithmetic, oral and written English, spelling, and penmanship; diagnostic and remedial techniques; criteria for selection, placement, and organization of the content of these subjects.
132. Art and Music in the Elementary School. (2) I and II.  
Prerequisite: courses 110 and 130. Mr. French in charge; Mr. Kyme  
Enrollment limited to facilities available.  
Functions, organization, instructional planning, implications of research in child development for teaching and selection of materials, and evaluation of educational outcomes in the art and music curricula in elementary schools.
134. Reading and Literature in the Elementary School. (2) I and II.  
Prerequisite: courses 110 and 130. Mr. Russell  
Objectives, standards of attainment, types of reading instruction, diagnostic and remedial techniques, reading readiness, place of reading in the activity program. Introduction to children's literature, children's interests in reading, criteria for selection of content, the place of supplementary and library reading.
138. Social Studies in the Elementary School. (2) I and II. Mr. Cappa  
Prerequisite: courses 110 and 130.  
Aims, content, and outcomes; unified social studies versus separate courses; critical analysis of typical units and courses of study; selection, sequence, and organization of units; the place of textbooks and supplementary materials; relation to the Three R's, the arts, and elementary sciences.
149. See under *Special Education*, page 110.
151. Administration of the School Health Program. (2) I and II.  
Mr. VanderSlicc  
Organization and administration of school health work; public health aspects of school hygiene in relation to school physician, nurse, principal, and teachers.
- \*152. Health Problems in the Secondary Schools. (2) I. \_\_\_\_\_
153. Mental Hygiene—Elementary. (2) I. Mrs. Jones  
Prerequisite: course 110.  
A basic course concerned with problems of childhood.
- \*154. Mental Hygiene—Advanced. (2) I. \_\_\_\_\_  
Prerequisite: course 153 or equivalent.
160. Vocational Education. (2) I. Mr. Moore  
Philosophy and organization of vocational education of less than college grade, with particular reference to principles underlying education for industry, agriculture, commerce, homemaking, and continuation education.

161. Occupational and Educational Information. (2) I and II. Mr. Stewart  
Lecture and laboratory.  
Labor market organization and dynamics; job analysis and community occupational surveys; investigation of training opportunities. Sources and interpretation of data.
162. Occupational Testing. (2) I and II. Mr. Stewart  
Prerequisite: course 114 or 119.  
Theory and practice in occupational testing; emphasis upon aptitude, interest, and personality measures; validity, reliability, and normative data. Supervised work in test administration, scoring, and interpretation.
164. Introduction to Student Personnel Work. (2) I and II. Mr. Froehlich  
Nature and scope of the student personnel program in schools and colleges; role of teacher, counselor, and administrator. Survey of basic tools and techniques.
165. Business Education in Secondary Schools. (3) I and II. Mr. Hitch  
This course is prerequisite to 320E, Section 13.
166. Home Economics Education. (3) I and II. Mrs. Hanson  
Designed for teachers, student dietitians, and nutritionists in public health.
170. Secondary Education. (2) I and II. Mr. Loban, Mr. Edwards  
Prerequisite: courses 110 and 111; ordinarily juniors will not be admitted. (These requirements will be administered without exception for all University of California students. Graduates from other institutions may take the prerequisites together with the course, but are advised that this will be a decided handicap.)
172. Junior High School Education. (2) I. Mr. Loban  
Prerequisite: course 110 (may be taken concurrently).
174. Reading and Literature at the Secondary Level. (2) II. Mr. Loban  
A survey of the literature read by adolescents, together with an examination of their reading problems and interests; an analysis of reading as employed in subject-matter areas other than English; an evaluation of relevant research with application to the classroom.
181. Adult Education. (3) I and II. Mr. London  
The functions and possibilities of adult education in our society. The resources available to those who do educational work with adults in public schools and other community agencies. The role of the public schools in facilitating coöperation among these agencies.
182. Problems of Adulthood. (3) I. Mr. London  
The examination of certain general psychological and sociological problems of adults. This course will be primarily concerned with physical growth, mental abilities, interests, attitudes, adjustments, and scope of activities in adulthood and old age.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Brownell in charge)

## GRADUATE COURSES

As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation will consist normally of the completion of at least 12 units of upper division work basic to the subject of the graduate course.

The admission of undergraduates to graduate courses is limited to seniors who have an average grade of at least B in the basic courses; the study-list limits in such cases are the limits imposed by the rules of the Graduate Division.

- 200A. The School in the Social Order. (3) I and II. Mr. Mosier  
A study of the interrelations of the school and society, of the complexity of the culture in which education functions, and of the political and social relations of the school to contemporary American society.
- 200B. Psychological Foundations of Education. (3) I and II. Mr. Brownell  
(Formerly numbered 210A.)  
Prerequisite: 8 units in Educational Psychology and/or Psychology.  
A systematic course designed to organize and to integrate the field of Educational Psychology at an advanced level.
- 200C. Foundations of Curriculum Development. (3) I. Mr. Parker  
A basic course in the general concepts, principles and practices of curriculum development, and the construction and evaluation of specific curricula.
- 200D. Public School Organization and Administration. (3) II. Mr. Bretsch  
The principles and practices of educational administration with respect to the teacher and the administrative personnel, state and local administrative organization, finance and business procedures, public relations. (Enrollment restricted to non-majors in administration.)
- 201A\*-201B. History of Education. Seminar. (2-2) Yr. Mr. Mosier  
Admission on consultation with instructor.
203. Problems in the History of Education. (2) I. Mr. Mosier  
Admission on consultation with instructor.  
An analytic and critical consideration of the literature in the history of education relating to selected issues in educational theory and practice.
- 206A-206B. Philosophy of Education. Seminar. (2-2) Yr. Mr. Lilge  
Admission on consultation with instructor.
209. Philosophical Issues in Contemporary Education. (2) I. Mr. Lilge  
Admission on consultation with instructor.  
A critical analysis of educational issues and their relation to major philosophical positions. Readings principally from significant current publications. For graduate non-specialists and majors in the history and philosophy of education.
- \*210. The Learning Process. (2) I. Mr. Buswell  
Prerequisite: consent of instructor.  
Limited to human learning and directed particularly to problems of school learning in the areas of skills, concept formation, problem solving, and aesthetic appreciation. Doctoral candidates in Educational Psychology may not register for this course.
- 211B. Children's Thinking. (2) II. Mr. Russell  
Prerequisite: consent of instructor.  
A study of children's learning and thinking from the developmental point of view, with particular reference to the influence of the home and the school; the role of perceptual and emotional factors in children's thinking; the development of children's concepts, problem-solving abilities, and creative thinking.

\* Not to be given, 1954-1955.

212. Analysis of Difficulties in Reading and Language Arts. (2) II. Mr. Buswell  
 Clinical procedures in the study of pupils who are failing in reading, spelling, and oral and written composition; various types and causes of failures; use of educational and psychological tests and informal analyses; corrective methods.
213. Individual Intelligence Tests in Guidance. (2) I. Mr. Holmes  
 Prerequisite: course 110, 111, 114, and consent of instructor.  
 A critical analysis of the history and techniques of individual intelligence testing. Individual intelligence tests and their use in assaying various intellectual components.
- \*214A. Advanced Statistics with Application to Methods of Educational Investigation. (2) I. Mr. Carter  
 Prerequisite: a course in elementary statistics and consent of instructor.  
 For students conducting investigations involving statistical analysis, or expecting to teach tests and measurements and statistical methods in colleges.
215. Advanced Educational Psychology. \_\_\_\_\_  
 Prerequisite: consent of instructor.  
 A systematic and critical appraisal of the scientific literature of the field.
- 215A. Principles and Theories of Psychological Measurement. (4) I. Mr. Carter  
 The development and application of methods of measuring human behavior, including intelligence, interests, attitudes, adjustment, etc. Primarily for doctoral candidates in Educational Psychology.
- 215B. Psychology of Learning. (4) II. Mr. Buswell  
 Learning and learning theory. Primarily for doctoral candidates in Educational Psychology.
- \*215C. Human Development: Individual Differences. (4) I. Mr. Tyler  
 The facts, principles, and generalizations concerning the nature of, and the factors related to, individual differences in human growth and development. Primarily for doctoral candidates in Educational Psychology.
- 215D. Human Development: Personal and Social Adjustment. (4) II. Mrs. Jones  
 Factors in personal-social relationships, patterns of adjustment and mature behavior, parent-teacher relationships and resources for guiding normal personality development. Primarily for doctoral candidates in Educational Psychology.
- 216A-216B. Educational Psychology. Seminar. (2-2) Yr.  
 Mr. Buswell (in charge), Mr. Carter, Mr. Gilbert, Mr. Holmes, Mrs. Jones
- 217A. Experimental Education. (2) I and II. Mr. Gilbert  
 Admission on consultation with instructor.  
 Laboratory experiments, with special reference to the more elaborate techniques applied to the various school subjects. The course includes voice recording, photographing eye movements in reading and spelling, analysis

\* Not to be given, 1954-1955.

of rhythm in reading, arithmetic, and writing, and studies of the motor responses accompanying appreciation. Each member of the class will participate in all experiments.

- 217B. Experimental Education. (2) II. Mr. Gilbert  
Prerequisite: course 217A.  
Students will be expected to complete an advanced laboratory project.
- 218A. The Psychological Bases of the Curriculum in Elementary Schools. (2) I. Mr. Russell  
(Formerly numbered 118.)  
Psychological problems in the use of materials and methods in the elementary school program. Part of the students' work will be a special study of psychological research in a selected area.
- 218B-218C. Investigations in the Curriculum of the Language Arts. (2-2) Yr. Mr. Russell  
(Formerly numbered 218A-218B.)  
Prerequisite: consent of instructor.  
A study of available and needed research in selected areas of the language arts. Some emphasis will be given to topics such as communication in modern life, child development in language abilities, language and thought, interrelationships of language and personality and curricular problems in the language arts. Students will work intensively in one area of special interest.
- \*218D. Investigations in the Curriculum of Arithmetic. (2) II. Mr. Brownell  
(Formerly numbered 219.)  
Prerequisite: consent of instructor.  
A critical analysis of selected research reports relating to the teaching and learning of arithmetic, with comprehensive reading and evaluation of research on problems of special interest to individual students.
- 224A-224B. School Curricula Seminar. (2-2) Yr. Mr. Parker  
Admission on consultation with instructor.
226. Curriculum Construction. (2) II. Mr. Parker
- \*227. Problems in Curriculum Development Practicum. (2) I. Mr. Parker  
Prerequisite: two courses in elementary and/or secondary curriculum, teaching experience, graduate standing, and consent of instructor.  
Designed especially for teachers, principals, and superintendents who wish to make specific plans and develop materials for specific curriculum problems in their schools.
229. In-Service Programs for School Personnel. (2) II. Mr. Parker  
Prerequisite: school experience.  
Current practices, problems, principles, and procedures in in-service education programs for public school personnel with emphasis upon evaluation. Designed for principals, directors, supervisors, superintendents and for teachers with interest or responsibility for in-service education.
- 230A-230B. Elementary Education Seminar. (2-2) Yr. Mr. Barnett  
Prerequisite: 12 units in education with teaching experience and consent of instructor.
231. Administration of Elementary Education Practicum. (2) I and II. Mr. Kyte  
Prerequisite: consent of instructor.

\* Not to be given, 1954-1955.



- 232A-232B. The Elementary School Curriculum Seminar. (2-2) Yr.  
Prerequisite: consent of instructor. Mr. Russell  
Current research and original investigation relating to the curriculum  
of the elementary school.
- 233A-233B. Supervision of Elementary Education Practicum. (2-2) Yr.  
Prerequisite: consent of instructor. Mr. Kyte
- 234A-234B. Supervision of Elementary Education Seminar. (2-2) Yr.  
Prerequisite: consent of instructor. Mr. Kyte
235. The Elementary School Curriculum. (2) I and II. Mr. Kyte  
Prerequisite: consent of instructor.
- 236A-236B. Evaluation of Elementary Education. (2-2) Yr.  
Prerequisite: consent of instructor. Mr. Barnett, Mr. Cappa  
Critical analysis of theories and principles of evaluation applied to  
elementary education; review of pertinent research studies in evaluation  
dealing with all aspects of elementary education.
237. Trends in Elementary Education. (2) I. Mr. Barnett  
Prerequisite: graduate standing and completion of at least 12 units in  
education.  
A survey of current practices descriptive of the emerging elementary  
school in the United States with special attention to their implications for  
the student's own professional needs.
- 240A-240B. Educational Administration Seminar. (2-2) Yr.  
Mr. Bretsch, Mr. Morphet
- 241A-241B. Introduction to Educational Administration. (4-4) Yr.  
Prerequisite: consent of instructor. Mr. Morphet, Mr. Bretsch  
A comprehensive introduction to the principles, practices and litera-  
ture of educational administration. Required for the master's degree in  
educational administration and for various administrative credentials.
242. Advanced Study in the Theory and Practice of Educational Adminis-  
tration.  
Prerequisite: Education 241A-241B and consent of instructor.  
Designed to provide opportunity for advanced study in the theory  
and practice of educational administration at elementary, secondary and  
adult education levels. Opportunity will be provided for exhaustive study  
of the basic related disciplines and problems in the respective areas.
- 242A. Local, state, and federal organization; education and government;  
educational law. (2-4) I. Mr. Morphet
- 242B. Administration of educational programs and services; pupil per-  
sonnel services. (2-4) II. Mr. Bretsch
- 242C. Administrative organization and personnel administration. (2-4) I.  
Mr. Bretsch
- 242D. Finance and business administration. (2-4) II. Mr. Morphet
- \*242E. School-community relations and schoolhousing. (2-4) I.  
Mr. Reller
- 258A-258B. Social Studies Education Seminar. (2-2) Yr. Mr. Cappa  
Prerequisite: consent of instructor.  
Research on problems in social studies education for advanced students.

\* Not to be given, 1954-1955.

- 260A-260B. Student Personnel Work Seminar. (2-2) Yr.  
Mr. Froehlich, Mr. Stewart  
Prerequisite: course 164 and consent of instructor.  
Research in the field of student personnel activities.
264. Organization and Administration of Student Personnel Services. (2)  
I and II. Mr. Stewart  
Prerequisite: course 164 and consent of instructor.  
Allocation of functional responsibilities; staff and line relationships; individual and group methods. Problems of budgeting, staffing, and equipping the program; record keeping and office management. Coördination of institutional and community resources.
266. Counseling Theory. (2) I. Mr. Froehlich  
Prerequisite: courses 119, 161, 162, 164, and consent of instructor.  
Basic counseling theory, schools of counseling, survey of counseling techniques.
267. Advanced Counseling. (2) II. Mr. Froehlich  
Prerequisite: course 266 and consent of instructor. Restricted to doctoral candidates in the field of student personnel work.  
Psychological foundations of counseling; diagnostic procedures and treatment; evaluation of counseling. Illustrative case materials.
- 270A-270B. Secondary Education Seminar. (2-2) Yr.  
Mr. Loban, Mr. Edwards  
Admission on consultation with instructor.
- 272A. Secondary School Curriculum: Basic Principles. (2) I. Mr. Parker  
Prerequisite: courses 110, 111, 170, or their equivalent, graduate standing, and consent of instructor.  
For advanced students who wish to make a thorough study of basic principles or curriculum development, with special reference to the secondary school.
- 272B. Secondary School Curriculum: Techniques of Curriculum Making.  
(2) II. Mr. Parker  
Prerequisite: course 272A, graduate standing, and consent of instructor.
273. Supervision in Secondary Schools. (2) I and II. Mr. Edwards  
Prerequisite: course 130 or 170, teaching experience, and consent of instructor.  
The organization, function, and techniques of supervision with special reference to secondary schools.
275. Secondary Education: Survey. (2) I and II. Mr. Lund  
Survey and critical review of secondary education literature, including research studies, yearbooks, reports, and other documents. Admission on consultation with instructor.
279. The Junior College Practicum. (2) I and II. Mr. Spindt
- 281A\*-281B. Adult Education Seminar. (2-2) Yr. Mr. London  
(Formerly numbered 281.)  
Prerequisite: course 181, or experience in adult education.  
Discussion of current problems and literature in adult education, with opportunity for members of the course to work on a solution of one of these problems or of a problem which confronts them in their work.

\* Not to be given, 1954-1955.

- \*292. Research Techniques. Seminar. (2) I. Mr. Buswell  
 Research problems in education; historical and scientific methods; design of investigations; bibliographical techniques, statistical methods, survey methods, and laboratory techniques; methods of reporting results.
293. Surveys and Field Studies. (2) II. Mr. Morphet  
 The theory, techniques, procedures, and results of surveys and field studies.
298. Directed Research. Seminar. (2-4) I and II.  
 The Staff (Mr. Brownell in charge)  
 Admission only with consent of instructor in charge.  
 Open only to candidates for the Ph.D. and Ed.D. degrees who have passed the departmental qualifying examinations and who present an approved plan of research, and in special cases, to students who present evidence of qualifications and approved plans for carrying on a particular type of research.
313. School Psychologist Internship. (4) II. Mr. Holmes  
 Prerequisite: course 213 and the consent of instructor.  
 Four to eight hours per week will be spent in supervised field work in which interns will make case reports and will participate in case conferences and staff meetings concerned with diagnosis and prognosis and the formulation of remedial procedures.
325. Field Work in Student Personnel Services. (2) I and II. Mrs. Kirk  
 Prerequisite: course 164, and consent of instructor.  
 Supervised field work in schools and other community agencies.
340. Directed Field Study and Internship in Educational Administration. (2-4) I. Mr. Bretsch, Mr. Morphet  
 Prerequisite: course 241A-241B, 293, and consent of instructor.

#### Supervised Teaching

Students must reserve a three-hour period daily. *Applications for admission* to these courses must have been made in Room 106, Haviland Hall, not later than April 5, 1954, for the fall semester, 1954; not later than November 1, 1954, for the spring semester, 1955; and not later than April 4, 1955, for the fall semester, 1955. Enrollment is limited to available facilities.

320. Secondary Supervised Teaching, Professional Methods. I and II.

Mr. Conrad, and Supervisory Staff

The University of California will accept only those candidates who meet the requirements set up by the State Department of Education in health, including specifically sight and hearing, and will not admit to courses 320A and 320C inexperienced applicants who are over 35 years of age.

Education 320A, 320C, 320E, 323, and 324 are scheduled as extra-session courses, to begin with the opening of the public schools and to end with the closing of the semester in the public schools. Thus teaching assignments in the fall semester, 1954, will begin on or about September 13 and end January 28. For the spring semester, 1955, they will begin on or about February 2 and end June 17. Students should make arrangements accordingly.

A limited number of internships in junior or senior high schools may be made available in the fall semester, 1954, or in the spring semester,

\* Not to be given, 1954-1955.

1955, for students who wish to enroll only in supervised teaching and methods courses in one semester and to spend practically all of their time during the school week in teaching and allied assignments in the public schools. Students should consult Mr. Conrad.

320A. Secondary Supervised Teaching. (3) I and II.

Mr. Conrad, and Supervisory Staff

Lectures, conferences, observations, and supervised teaching.

Prerequisite: courses 110, 111, 170, 320B. Course 320E (major field) must be taken concurrently with course 320A. In order to enroll in Education 320A, students should meet the grade-point requirements listed on page 102 and must have been admitted to the Graduate Division.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 107).

320B. Audio-Visual Instruction: Materials and Techniques. (2) I and II.

Mr. Foster

Lectures, conferences, demonstrations, laboratory experiences.

Prerequisite: course 110.

Course 320B should be taken in the semester preceding enrollment in 320A, but may be taken concurrently with Education 320A, provided that ample time is allowed for the assignment in supervised teaching.

Theoretical and psychological factors; implications of research studies; operation of equipment; selection, evaluation, and utilization of materials; preparation of handmade slides, graphic displays, materials for opaque projection, duplicated and fugitive materials; the services offered teachers by the audio-visual departments of school systems.

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

Mr. Conrad, and Supervisory Staff

Conferences, observation, and supervised teaching.

Prerequisite: courses 110, 111, 170, 320A, 320B. Students must reserve a three-hour period daily.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 107).

320E. Methods of Teaching. (2) I and II.

Mr. Conrad, and Supervisory Staff

Lectures, conferences, and laboratory.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 107).

All students enrolled in 320A or 324 must carry concurrently one of the following sections:

Sec. 2. Life Science and Physical Science.

Mr. Polson

Sec. 3. Mathematics.

Mr. Hoge

Sec. 4. English.

Miss Ryan, Mr. Loban, Mr. Squire

Sec. 5. Foreign Languages.

Mr. Schevill

Sec. 7. Social Studies.

Mrs. Jackson, Miss Ogden, Miss Stewart

Sec. 8. Physical Education for Men.

Mr. Newsom

Sec. 9. Physical Education for Women.

Miss Wagenet

Sec. 10. Art.

Miss Hole

Sec. 11. Homemaking.

Mrs. Hanson

Prerequisite: course 166.

Sec. 12. Music.

Mr. Kyme

Sec. 13. Business Education.

Mr. Hitch

Course 165 is prerequisite to supervised teaching in business education.

Sec. 16. Junior College.

Mr. Conrad

## \*Sec. 17. Special Education.

Admission on approval of instructor. Hours to be arranged.

## School Library Administration (Librarianship 206).

Miss Boyd

This course is required of all applicants for the special secondary credential in public school librarianship or for the general secondary credential with major in Librarianship.

## 323. Practicum in Supervised Teaching. (2-4) I and II.

Mr. Conrad

Prerequisite: a course in supervised teaching or experience as a teacher, and consent of the instructor. Candidates who are graduates of other institutions must submit transcripts of record at the time of application.

An opportunity to obtain more extended and varied experience under supervision.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 107).

## 324. Junior College Supervised Teaching. (4) I and II.

Mr. Conrad

Conferences, observation, and supervised teaching.

Prerequisite: course 279, which may be taken concurrently if circumstances require. Course 320E, Sec. 16, must be taken concurrently.

Sec. 1. Limited to teaching assistants employed by the University.

Sec. 2. Open to all other candidates for the Junior College Credential.

For students enrolled in Section 2 this is an extra-session course, beginning and ending with the semester in the public schools (see page 107).

## 330. Elementary Supervised Teaching, Professional Methods. I and II.

Mr. Dumas, and Supervisory Staff

The University of California will accept for teacher education only those candidates who meet the requirements set up by the State Department of Education in health, including specifically sight and hearing; the University of California will not admit to course 330C inexperienced applicants who are over 35 years of age.

Students must have not less than a grade-point average of 1.5 in the work of the upper division in order to enroll in courses 330A and 330C. Graduate standing is prerequisite to course 330C.

For students enrolled in Education 330C this is an extra-session course, beginning and ending with the semester in the public schools (see page 107).

## 330A. Introduction to Elementary Teaching. (2) I and II.

Mr. Dumas

Lectures, conferences, laboratory, and field work.

Observations and participation in public school work. Students must reserve at least one two-hour period for field work each week.

## 330C. Elementary Supervised Teaching. (6) I and II.

Mr. Dumas in charge

Prerequisite: courses 110, 111, 130, 131, 132, 134, 133, 330A; Decorative Art 6A; Music 10; History 189A or 189B; Physical Education 26, Section on Elementary School Skills.

Conferences, observation, and supervised teaching.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 107).

\* Not to be given, 1954-1955.

330E. Methods of Teaching in Elementary School or Junior High School. (2) I and II. Mr. Dumas and Supervisory Staff

Restricted to candidates for the General Junior High School Credential or for the General Elementary School Credential. Must be taken concurrently with course 330C.

331. Elementary Supervised Teaching: Materials of Instruction and Class Management. (2) I and II. Mr. Dumas in charge

Restricted to candidates for the General Junior High School Credential or for the General Elementary School Credential. Must be taken concurrently with course 330C.

#### Special Education

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

\*326. Supervised Teaching in Special Education. (4) II. \_\_\_\_\_

Prerequisite: course 149, which may be taken concurrently if circumstances require. Course 320E, Sec. 17, must be taken concurrently with 326. Open only to candidates for a credential in special education and only after consultation with the instructor in charge of the course.

370. Speech Defects and Disorders with Corrective Techniques. (2) II.

Prerequisite: course 110. Mrs. Gifford

Designed to give students, teachers and administrators a broader understanding of the causes and treatment of speech defects and disorders. Includes classification of speech defects and disorders, theories of functional and organic disorders of voice and speech; the causes and treatment of stuttering and articulatory defects, and methods used in the speech correction classes in the public school in California.

\*379. Educational Treatment of Cerebral Palsied Children. (2) II. \_\_\_\_\_

Admission only on consultation with instructor.

#### COURSES IN OTHER DEPARTMENTS ACCEPTED AS ELECTIVES FOR TEACHING CREDENTIALS IN EDUCATION

English 300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I and II.

Librarianship 206. School Library Administration. (2) II.

Mathematics 107. Mathematics in Secondary Schools. (2) I.

Music 328A. Methods of Teaching Vocal Techniques. (2) I.

Music 328B. Methods of Teaching Vocal Techniques. (2) II.

Music 329A. Methods of Teaching Stringed Instruments. (1) I and II.

Music 329B. Methods of Teaching Brass Instruments. (1) I.

Music 329C. Methods of Teaching Woodwind Instruments. (1) II.

Music 329D. Methods of Teaching Percussion Instruments. (1) I.

Music 329E. Ensemble: Literature for School Orchestra and Band. (1) II.

## EMERGENCY MEDICINE

(Department Office, 4549 Life Sciences Building)

John B. Lagen, M.D., *Associate Professor of Medicine, School of Medicine, San Francisco (Chairman of the Department of Emergency Medicine).*

Effective with the academic year 1954-1955, courses in Emergency Medicine will be offered in place of courses formerly called "Medico-Military Science and Tactics." Course 121A-121B is required of all first-year medical students.

\* Not to be given, 1954-1955.

Courses 122A-122B, for second-year students, 123A-123B, for third-year students, and 124A-124B, for fourth-year students, will be given at the School of Medicine in San Francisco. For further information concerning the courses in Emergency Medicine, consult Dr. John B. Lagen, Associate Dean of the School of Medicine, San Francisco.

121A-121B. Emergency Medicine (First Year). (1-1) Yr. Mr. Lagen  
Outline of disaster preparedness plans and civil defense measures with emphasis on Campus Disaster Plan. Emphasis is on first aid, including bandaging and splinting; also transportation of wounded. Introduction to medical and surgical emergencies.

## ENGINEERING

(Department Office, 218 Engineering Building)

Morrrough P. O'Brien, B.S., *Professor of Engineering (Chairman of the Department)*.

Joe W. Kelly, B.S., *Professor of Civil Engineering (Vice-Chairman of the Department)*.

### CIVIL ENGINEERING AND IRRIGATION

(Division Office, 9 Engineering Building)

Frank Baron, M.S., D.Sc., *Professor of Civil Engineering and Director of the Structural Engineering Laboratory*.

Harmer E. Davis, M.S., *Professor of Civil Engineering (Chairman of the Division) and Director of the Institute of Transportation and Traffic Engineering*.

Howard D. Eberhart, M.S., *Professor of Civil Engineering*.

Harold B. Gotaas, Sc.D., *Professor of Sanitary Engineering and Director of the Sanitary Engineering Laboratory*.

Bruce Jameyson, B.S., *Professor of Civil Engineering (Vice-Chairman of the Division)*.

Paul F. Keim, M.Sc., *Professor of Civil Engineering*.

Joe W. Kelly, B.S., *Professor of Civil Engineering*.

†Ralph A. Moyer, M.S., C.E., Sc.D., *Professor of Civil Engineering*.

Egor P. Popov, Ph.D., *Professor of Civil Engineering*.

Thomas R. Simpson, B.S., *Professor of Irrigation Engineering*.

George E. Troxell, B.S., *Professor of Civil Engineering*.

Raymond E. Davis, C.E., D.Eng., *Professor of Civil Engineering, Emeritus, and Director of Engineering Materials Laboratory, Emeritus*.

Charles Derleth, Jr., C.E., LL.D., *Professor of Civil Engineering, Emeritus*.

Bernard A. Etcheverry, B.S., *Professor of Irrigation and Drainage, Emeritus*.

Francis S. Foote, E.M., *Professor of Railroad Engineering, Emeritus*.

Sidney T. Harding, B.S., *Professor of Irrigation, Emeritus*.

Charles G. Hyde, B.S., LL.D., *Professor of Sanitary Engineering, Emeritus*.

Wilfred F. Langelier, M.S., *Professor of Sanitary Engineering, Emeritus*.

<sup>1</sup> Boris Bresler, M.S., *Associate Professor of Civil Engineering*.

Ray W. Clough, Jr., Sc.D., *Associate Professor of Civil Engineering*.

Frederick L. Hotes, M.S., *Associate Professor of Irrigation Engineering*.

Tung-Yen Lin, M.S., *Associate Professor of Civil Engineering*.

† Sabbatical leave in residence, 1954-1955.

<sup>1</sup> In residence fall semester only, 1954-1955.

- Erman A. Pearson, Sc.D., *Associate Professor of Sanitary Engineering.*  
 Jerome M. Raphael, S.M., *Associate Professor of Civil Engineering.*  
 Bernard D. Tebbens, Sc.D., *Associate Professor of Industrial Hygiene Engineering.*  
 John Hugh Jones, M.S., *Assistant Professor of Civil Engineering.*  
 Warren J. Kaufman, Sc.D., *Assistant Professor of Sanitation and Sanitary Engineering.*  
 Francis H. Moffitt, M.C.E., *Assistant Professor of Civil Engineering.*  
 Gerald T. Orlob, M.S., *Assistant Professor of Civil Engineering.*  
 Joseph Penzien, Sc.D., *Assistant Professor of Civil Engineering.*  
 David Pirtz, M.S., *Assistant Professor of Civil Engineering.*  
 Karl S. Pister, Ph.D., *Assistant Professor of Civil Engineering.*  
 Milos Polivka, M.S., *Assistant Professor of Civil Engineering.*  
 Charles F. Scheffey, M.S., *Assistant Professor of Civil Engineering.*  
 Alexander C. Scordelis, M.S., *Assistant Professor of Civil Engineering.*  
 Harry Bolton Seed, Ph.D., *Assistant Professor of Civil Engineering.*  
 Cameron M. Smith, D.C.E., *Assistant Professor of Civil Engineering.*  
 David K. Todd, Ph.D., *Assistant Professor of Civil Engineering.*  
 Carl L. Monismith, M.S., *Instructor in Civil Engineering.*



- Edwin S. Crosby, Ph.D., *Assistant Professor of Public Health and Sanitary Science.*  
 Alexander Klein, M.S., *Lecturer in Civil Engineering.*  
 P. H. McGauhey, M.S., *Lecturer in Civil Engineering and Irrigation.*

### ELECTRICAL ENGINEERING

(Division Office, 131 Cory Hall)

- Leonard J. Black, Ph.D., *Professor of Electrical Engineering.*  
 Charles F. Dalziel, E.E., *Professor of Electrical Engineering.*  
 Dan M. Finch, B.S., *Professor of Electrical Engineering.*  
 Thomas C. McFarland, M.S., *Professor of Electrical Engineering.*  
 Paul L. Morton, Ph.D., *Professor of Electrical Engineering (Chairman of the Division).*  
 \* Lester E. Reukema, Ph.D., *Professor of Electrical Engineering.*  
 Burtis L. Robertson, Ph.D., *Professor of Electrical Engineering.*  
 Herbert J. Scott, E.E., *Professor of Electrical Engineering.*  
 Samuel Silver, Ph.D., *Professor of Engineering Science.*  
 John R. Whinnery, Ph.D., *Professor of Electrical Engineering (Vice-Chairman of the Division).*  
 Diogenes Angelakos, Ph.D., *Associate Professor of Electrical Engineering.*  
 Joseph T. Gier, M.S., *Associate Professor of Electrical Engineering.*  
 Arthur M. Hopkin, Ph.D., *Associate Professor of Electrical Engineering.*  
 Wilson S. Pritchett, M.S., *Associate Professor of Electrical Engineering.*  
 \* Robert M. Saunders, M.S., *Associate Professor of Electrical Engineering.*  
 David H. Sloan, Ph.D., *Associate Professor of Electrical Engineering.*  
 \* Otto J. M. Smith, Ph.D., *Associate Professor of Electrical Engineering.*  
 John R. Woodyard, Ph.D., *Associate Professor of Electrical Engineering.*

\* In residence spring semester only, 1954-1955.

\* Absent on leave, 1954-1955.



Henry C. Bourne, Sc.D., *Assistant Professor of Electrical Engineering.*  
 Karl Hinrichs, M.S., *Acting Assistant Professor of Electrical Engineering.*  
 Albert S. Hoagland, Ph.D., *Assistant Professor of Electrical Engineering.*  
 Ralph S. Mackay, Ph.D., *Assistant Professor of Electrical Engineering.*  
 George L. Matthaai, Ph.D., *Assistant Professor of Electrical Engineering.*  
 Eliahu I. Jury, Sc.D., *Instructor in Electrical Engineering.*  
 Dwight W. Brede, M.S., *Associate in Electrical Engineering.*



Herbert R. Johnston, M.S., *Lecturer in Electrical Engineering.*

#### ENGINEERING DESIGN

(Division Office, 124 Building T-7)

Clyne F. Garland, M.S., *Professor of Engineering Design (Chairman of the Division).*

Alexander S. Levens, M.S., C.E., *Professor of Engineering Design.*

James L. Meriam, Ph.D., *Professor of Engineering Mechanics.*

† Walter W. Soroka, Sc.D., *Professor of Engineering Design.*

Carl W. Nelson, Ph.D., *Associate Professor of Engineering Design.*

William S. Rouverol, M.S., *Associate Professor of Engineering Design.*

Clinton J. Ancker, Jr., M.S., M.E., *Assistant Professor of Engineering Design.*

Cyril P. Atkinson, M.S., *Assistant Professor of Engineering Design.*

Kenneth E. Barnhart, Jr., M.S., *Acting Assistant Professor of Engineering Design.*

G. Wayne Brown, M.S., *Assistant Professor of Engineering Design.*

Francis R. Berry, Jr., M.S., M.E., *Assistant Professor of Engineering Design.*

Don M. Cunningham, M.S., *Assistant Professor of Engineering Design.*

Joseph Frisch, M.S., *Assistant Professor of Engineering Design.*

Werner Goldsmith, Ph.D., *Assistant Professor of Engineering Design.*

Albert L. Hale, M.S., *Acting Assistant Professor of Engineering Design.*

Charles W. Radcliffe, M.S., *Acting Assistant Professor of Engineering Design.*

Robert F. Steidel, Jr., M.S., *Assistant Professor of Engineering Design.*



George E. Davis, M.A., *Lecturer in Engineering Design.*

Alfred E. Edstrom, M.A., *Lecturer in Engineering Design.*

Winfield W. Sisson, B.S., *Lecturer in Engineering Design.*

#### MECHANICAL ENGINEERING

(Division Office, 115 Engineering Building)

E. Paul DeGarmo, M.S., *Professor of Industrial Engineering.*

Everett D. Howe, M.S., *Professor of Mechanical Engineering (Chairman of the Division) and Director of the Mechanical Engineering Laboratories.*

Hans Albert Einstein, D.S.T., *Professor of Hydraulic Engineering.*

Francis W. Hutchinson, M.S., M.E., *Professor of Mechanical Engineering.*

Harold A. Johnson, M.S., *Professor of Mechanical Engineering (Vice-Chairman of the Division).*

† Sabbatical leave in residence, 1954-1955.

- <sup>1</sup> Joe W. Johnson, M.S., *Professor of Hydraulic Engineering.*
- † Edmund V. Laitone, M.A., *Professor of Mechanical Engineering.*
- Henry A. Schade, Dr. Ing., *Professor of Naval Architecture and Director of Engineering Research.*
- Leonid Michael Tichvinsky, D.E.M., *Professor of Mechanical Engineering.*
- Erich G. Thomsen, Ph.D., *Professor of Mechanical Engineering.*
- <sup>1</sup> Carl J. Vogt, M.S., *Professor of Mechanical Engineering.*
- Baldwin M. Woods, Ph.D., *Professor of Mechanical Engineering.*
- ‡ James S. Campbell, Jr., M.M.E., *Associate Professor of Mechanical Engineering.*
- Israel I. Cornet, Ph.D., *Associate Professor of Mechanical Engineering.*
- Louis E. Davis, M.S., *Associate Professor of Industrial Engineering.*
- \* Robert M. Drake, Jr., Ph.D., *Associate Professor of Mechanical Engineering.*
- † Robert V. Dunkle, M.S., *Associate Professor of Mechanical Engineering.*
- Leonard Farbar, M.S., *Associate Professor of Mechanical Engineering.*
- Raymond C. Grassi, M.S., *Associate Professor of Mechanical Engineering.*
- Lawrence M. Grossman, Ph.D., *Associate Professor of Mechanical Engineering.*
- Harold W. Iversen, M.S., *Associate Professor of Mechanical Engineering.*
- Edward C. Keachie, Ph.D., *Associate Professor of Mechanical Engineering.*
- James T. Lapsley, Jr., M.S., *Associate Professor of Mechanical Engineering.*
- Antoni K. Oppenheim, Ph.D., *Associate Professor of Mechanical Engineering.*
- <sup>1</sup> Samuel A. Schaaf, Ph.D., *Associate Professor of Engineering Science.*
- Ralph A. Seban, Ph.D., *Associate Professor of Mechanical Engineering.*
- Nathan W. Snyder, Ph.D., *Associate Professor of Mechanical Engineering.*
- Paul B. Stewart, Ph.D., *Associate Professor of Mechanical Engineering.*
- Richard A. Fayram, M.S., *Assistant Professor of Mechanical Engineering.*
- \* Rostislav A. Galuzevski, M.S., *Assistant Professor of Mechanical Engineering.*
- Warren H. Giedt, Ph.D., *Assistant Professor of Mechanical Engineering.*
- David C. Ipsen, Ph.D., *Assistant Professor of Mechanical Engineering.*
- Alan D. K. Laird, Ph.D., *Assistant Professor of Mechanical Engineering.*
- Bruce G. McCauley, M.B.A., M.S., *Assistant Professor of Mechanical Engineering.*
- Virgil E. Schrock, M.S., M.E., *Assistant Professor of Mechanical Engineering.*
- Ernest S. Starkman, M.S., *Assistant Professor of Mechanical Engineering.*
- Lawrence Talbot, Ph.D., *Assistant Professor of Mechanical Engineering.*
- Frederick S. Sherman, Ph.D., *Instructor in Mechanical Engineering.*



- Earl E. R. Jones, B.S., *Lecturer in Mechanical Engineering.*
- Frank L. Maker, M.E., *Lecturer in Mechanical Engineering.*
- George J. Maslach, B.S., *Lecturer in Mechanical Engineering.*
- Roland W. Pinger, M.E., *Lecturer in Mechanical Engineering.*
- Herman Thal-Larsen, M.S., *Lecturer in Mechanical Engineering.*

<sup>1</sup> In residence fall semester only, 1954-1955.

\* Absent on leave, 1954-1955.

† Sabbatical leave in residence, 1954-1955.

‡ Sabbatical leave in residence, fall semester, 1954-1955.

**MINERAL TECHNOLOGY**

(Division Office, 114 Hearst Memorial Mining Building)

Anders J. Carlson, C.E., Ph.D., *Professor of Petroleum Engineering.*John E. Dorn, Ph.D., *Professor of Metallurgy.*Ralph R. Hultgren, Ph.D., *Professor of Metallurgy.*Earl R. Parker, Met.E., *Professor of Metallurgy (Chairman of the Division of Mineral Technology).*Joseph A. Pask, Ph.D., *Professor of Ceramic Engineering.*John A. Putnam, Ph.D., *Professor of Petroleum Engineering.*S. Frederick Ravitz, Ph.D., *Professor of Metallurgy.*Lysle E. Shaffer, E.M., *Professor of Mining (Vice-Chairman of the Division of Mineral Technology).*Edward H. Wisser, B.S., *Professor of Mineral Exploration.*Lester C. Uren, B.S., *Professor of Petroleum Engineering, Emeritus.*David W. Mitchell, Ph.D., *Associate Professor of Metallurgy.*Alan W. Searcy, Ph.D., *Associate Professor of Ceramic Engineering.*<sup>2</sup> Wilbur H. Somerton, Pet.E., *Associate Professor of Petroleum Engineering.*Jack Washburn, Ph.D., *Assistant Professor of Metallurgy.*Kenneth K. Kelley, Ph.D., *Lecturer in Metallurgy.*Frank G. Miller, Ph.D., *Lecturer in Petroleum Engineering.*Parker D. Trask, Ph.D., *Lecturer in Geological Engineering.***TRANSPORTATION ENGINEERING**

(Division Office, 100 Building T-11)

Donald S. Berry, Ph.D., *Professor of Transportation Engineering (Chairman of the Division).*Harmer E. Davis, M.S., *Professor of Civil Engineering.*Ralph A. Moyer, M.S., C.E., Sci.D., *Professor of Civil Engineering.*Daniel M. Belmont, M.S., *Lecturer in Transportation Engineering.*Robert Horonjeff, B.S., *Lecturer in Transportation Engineering.*W. Norman Kennedy, B.S., *Lecturer in Transportation Engineering.*Wayne H. Snowden, B.S., *Lecturer in Transportation Engineering.*<sup>2</sup> Richard M. Zettel, M.A., *Lecturer in Transportation Engineering.*

Inspection trips may be a part of the academic program of any course given by the divisions of the Department of Engineering.

Lower division courses in the Department of Engineering which are of general interest to students in various curricula are listed under Engineering.

In addition to the prerequisites noted, Engineering students must complete the Engineering Examination, Lower Division.

**ENGINEERING****LOWER DIVISION COURSES**

1A-1B. Plane Surveying. (3-3) Yr. Beginning each semester.

Prerequisite: trigonometry. The Staff (Mr. Moffitt in charge)

Principles; field practice, calculations and mapping.

<sup>2</sup> In residence spring semester only, 1954-1955.

- 2A-2B. Supplementary Course in Plane Surveying: Field Work. (1-1) Yr.  
Beginning each semester. The Staff (Mr. Moffitt in charge)  
Open only to students entering the college at Berkeley with 2 units of credit for recitations and lectures in courses 1A-1B.
8. Materials of Engineering Construction. (2) I and II.  
Mr. Kelly, Mr. Polivka  
Prerequisite: sophomore standing in civil engineering.  
Structural properties and adaptability of various materials.
- 18A-18B. Strength of Materials. (3-3) Yr. Beginning each semester.  
Mr. Kelly, Mr. Polivka, Mr. Raphael, Mr. Scheffey  
For students in architecture. Prerequisite: Mathematics 3B, Physics 2A and 3A or 4A, and course 21, which may be taken concurrently with course 18A.  
Elementary analytic mechanics; application of statics and theory of elasticity to elements of structural design.
21. Plane Surveying. (3) I and II. The Staff (Mr. Moffitt in charge)  
Lectures and field work.  
Prerequisite: trigonometry and one high school unit in mechanical drawing. Prescribed for students in architecture and landscape architecture; not open to students in engineering.  
Principles; field practice; calculations and mapping.
22. Engineering Graphics. (2) I and II. Mr. Levens  
One lecture and five laboratory hours per week.  
Prerequisite: courses 23 or 23D.  
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) I and II. The Staff (Mr. Levens in charge)  
One lecture and five laboratory hours per week.  
Prerequisite: Mathematics 3A (may be taken concurrently); plane geometry, trigonometry, and mechanical drawing.  
The fundamental principles of descriptive geometry and their application to the solution of three-dimensional problems arising in the various branches of engineering.
- 23D. Mechanical Drawing and Descriptive Geometry. (2) I and II.  
The Staff (Mr. Levens in charge)  
Two lectures and seven laboratory hours per week.  
Prerequisite: Mathematics 3A (may be taken concurrently); plane geometry, and trigonometry. Prescribed for, and limited to, students deficient in high school drawing matriculation requirement.  
Course content is the same as course 23, except that it is preceded by an intensive introductory course in mechanical drawing during the first third of the semester.
24. Advanced Engineering Drawing. (2) I and II.  
The Staff (Mr. Levens in charge)  
One lecture and five laboratory hours per week.  
Prerequisite: courses 22 and 23 or 23D.  
Cams and gears; working drawings of machine parts; freehand sketching; structural detailing; piping layouts; and introduction to graphic integration and differentiation.

35. Statics. (3) I and II. The Staff (Mr. Meriam in charge)  
 Prerequisite: Physics 4A, Mathematics 4A and 4B (Mathematics 4B may be taken concurrently). Courses 23 or 23D strongly recommended.  
 Force systems and equilibrium conditions with emphasis on engineering problems covering structures, machines, distributed forces, and friction. Includes graphical and algebraic solutions and an introduction to the method of virtual work.
40. Elementary Metallurgy. (3) I and II. Mr. Dorn, Mr. Hultgren, Mr. Washburn  
 Two lectures and one laboratory period per week.  
 Prerequisite: Chemistry 1A, Physics 4A and 4B or 4C (may be taken concurrently).  
 An elementary course for students in agricultural, industrial, mechanical, and process engineering describing the relationships between microstructure, composition, heat and mechanical treatment, and physical properties of metals and alloys. Heat treatment of steel and nonferrous metals, production of steel, aluminum, and magnesium. Description of many engineering alloys.  
 Not open to metallurgy majors. Students specializing in metallurgy should take Chemistry 1B and Metallurgy 150A.
- 40K. Elementary Metallurgy. (2) I and II. Mr. Dorn, Mr. Hultgren, Mr. Washburn  
 Prerequisite: same as for course 40.
- 40L. Elementary Metallurgy Laboratory. (1) I and II. Mr. Washburn  
 Prerequisite: course 40K, which may not be taken concurrently.  
 The laboratory part of course 40.
41. Manufacturing Processes. (4) II. The Staff (Mr. Grassi in charge)  
 Two lectures, one three-hour demonstration period, and one three-hour laboratory period per week.  
 Prerequisite: courses 23 or 23D and 40; Chemistry 1A; Physics 4A.  
 Nonmetals; casting processes; gauging; metal cutting; general-purpose and production-type machine tools; tooling; jigs and fixtures; hot and cold forming; grinding; protective and decorative surface treatments; gas and electric welding; relation of design to production.
42. Materials and Processes of Manufacturing. (4) I. The Staff (Mr. Grassi in charge)  
 Two lectures, one three-hour demonstration period, and one three-hour laboratory period per week.  
 Prerequisite: course 23 or 23D, Chemistry 1A, Physics 4A. For students in electrical engineering.  
 The nature and properties of materials commonly used in manufacturing and their relation to manufacturing processes. Heat treatment of metals; casting; hot and cold forming; gauging; cutting of metals; shapers; lathes; drill presses, milling machines, grinders; resistance and fusion welding.
48. The Engineering Student and His Profession. (1) I. Mr. Woods, Mr. Rouverol  
 Prerequisite: freshman standing in an engineering program of study.  
 The fields of engineering; the great engineers and their achievements; the profession and its trends. The engineering student in a university; the engineer in his profession and as a member of society.

## UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of the lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

## 100. Materials and Methods Used in Manufacturing. (3) I and II.

Mr. Lapsley, Mr. Grassi

Prerequisite: junior standing in Business Administration. Not open to students in engineering.

Study of the common materials (metals and non-metals), processes and equipment used in modern manufacturing.

## 113. Introduction to the Professional Aspects of Engineering. (2) I and II.

The Staff (Mr. Levens in charge)

Prerequisite: senior standing in engineering. To be taken during the year of intended graduation.

Development of an understanding of the professional responsibilities of the engineer; practice in the elements of effective speaking and in the preparation of acceptable engineering reports; study and discussion of selected topics of value to the engineer beginning his career.

## 120. Principles of Engineering Investment and Economy. (3) I and II.

Mr. DeGarmo (in charge), Mr. Keachie, Mr. Pinger, Mr. McCauley

Prerequisite: Mechanical Engineering 105A, or Physics 112, or Chemistry 110B; Electrical Engineering 100A, 101, or 110A, or Physics 110A; Civil Engineering 108A.

Derivation of formulas used in the theory of investment; economy studies applied to original and alternative investments in engineering enterprise; replacement problems; relation of personnel and quality control factors to engineering economy; economy studies of governmental projects.

## 197. Summer Course in Hydroelectric Inspections. (4) Mr. Dalziel

Prerequisite: senior or graduate standing in engineering; enrollment subject to consent of instructor.

Three-week inspection trip to selected hydroelectric projects in California. At the conclusion of the trip, the remainder of the Summer Session will be spent in the preparation of a written report. Inspections will include various types of dams, canals, conduits, penstocks, valves, hydraulic turbines, electric generators, transformers, switchgear, protective devices, and high-voltage transmission apparatus.



Courses characteristic of the various curricula offered by the College of Engineering are described under the several divisions of the department, as follows:

**CIVIL ENGINEERING AND IRRIGATION****Civil Engineering**

## UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of the lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

101. Elementary Photogrammetry. (3) I. Mr. Moffitt  
 Prerequisite: Engineering 1A-1B.  
 Geometry of single vertical photograph; stereoscopy and parallax measurement; principles of radial line plot; mosaics; oblique photographs. Laboratory includes flight planning, stereoscopic studies, topographic compilation by stereo-plotting, radial line plot, tilt determination, and orientation in multiplex.
- 102A. Route Surveying. (3) I and II. Mr. Moffitt, Mr. J. H. Jones  
 Lectures and field work.  
 Prerequisite: Engineering 1A-1B.  
 Simple, compound, and transition curves, reconnaissance, preliminary and location surveys; calculations of earthwork and other quantities; field work.
- 102B. Economics of Railroad Locations. (3) II. Mr. J. H. Jones  
 Prerequisite: course 102A.  
 Influence of location upon earning power, with particular reference to effect of changes in distance, grade, and curvature upon operating expenses; plotting of maps, profiles, and mass diagrams; drafting of railroad structures.
- 103A. Supplementary Course in Route Surveying: Field Work. (1) I and II.  
 The Staff (Mr. Moffitt in charge)  
 Open only to students entering the college at Berkeley with 2 units of credit for recitations and lectures in course 102A.
104. Railroad Engineering. (2) I. Mr. J. H. Jones  
 Prerequisite: course 102B.  
 Grading, tunnels, signaling, track, yards, maintenance, line and grade changes.
- \*105. Higher Surveying and Geodesy. (2) II. Mr. Moffitt  
 Prerequisite: Engineering 1A-1B.  
 Methods of geodetic surveying; adjustment of observation; geodetic positions; map projections.
106. Highway Engineering. (2) I and II. Mr. J. H. Jones  
 Prerequisite: Engineering 1B, 8, and junior standing in engineering.  
 Location, design, economics, drainage, construction, and maintenance of highways, streets, and pavements; drainage and pavements for airports.
- 107A. Framed Structures. (3) I and II. Mr. Eberhart, Mr. Bresler  
 Prerequisite: course 108A.  
 Computation of stresses in roofs, building frames, and simple bridge trusses, by algebraic and graphical methods.
- 107E. Reinforced Concrete Design. (3) I and II. Mr. Troxell, Mr. Scordelis  
 Prerequisite: senior standing and course 112 (may be taken concurrently).  
 For architectural students. Design of reinforced concrete buildings, including foundations and retaining walls.
- 107F. Framed Structures. (3) I and II.  
 Mr. Troxell, Mr. Scordelis, Mr. Smith  
 Prerequisite: senior standing and courses 112 and 107E, the latter may be taken concurrently.  
 For architectural students. Stress computations and design of structures in wood, steel, and reinforced concrete, particularly of buildings.

\* Not to be given, 1954-1955.

## 107G. Analysis of Airplane Structures. (3) I and II.

Mr. Eberhart, Mr. Bresler

Prerequisite: course 107A or Engineering Design 106.

Solution of typical stress analysis problems; load requirements; thin web beams; monocoque construction; plate stringer combinations; beam columns; space frames.

## 108A. Strength of Materials. (3) I and II.

Prerequisite: Engineering 35. The Staff (Mr. Popov in charge)

Elastic and ultimate resistance of materials; stress analysis for bars, beams, columns, and shafts; deflections and combined stresses; elements of design for wood and steel structures.

## 108C. Civil Engineering Laboratory. (1) I and II.

The Staff (Mr. Troxell in charge)

Prerequisite: Engineering 8 and course 108A.

Principles and methods of testing engineering materials. Physical tests of brick, concrete, iron, steel, and wood.

## 108E. Concrete Laboratory. (2) I and II.

The Staff (Mr. Troxell in charge)

Prerequisite: Engineering 8 and course 108A, the latter may be taken concurrently.

Physical tests of cement, aggregates, and concrete; proportioning and properties of concrete mixtures.

## 108F. Materials Testing Laboratory. (1) I and II.

The Staff (Mr. Kelly in charge)

Prerequisite: for engineering students, course 108A (may be taken concurrently); for architecture students, Engineering 18B.

For students in agricultural, electrical, industrial, mechanical and petroleum engineering, physical metallurgy, and architecture.

Principles and methods of testing engineering materials. Physical tests of concrete, steel, iron, and wood.

## 108G. Asphalt Laboratory. (1) I and II.

Mr. Monismith

Prerequisite: senior standing in civil engineering.

Laboratory tests on asphalts and aggregates to determine suitability for use in paving mixtures. Design of asphaltic mixtures including proportioning and preparation of specimens for tests to determine stability.

## 108H. Soil Mechanics. (2) I and II.

Mr. Seed

Lecture and laboratory.

Prerequisite: course 113, which may be taken concurrently.

Lectures on soil mechanics with selected experiments on physical and mechanical properties of soils for engineering uses.

## 109A. Sewerage Engineering. (2) I and II.

Mr. Gotaas, Mr. Pearson, Mr. Kaufman, Mr. Orlob

Prerequisite: Mechanical Engineering 103.

Flow in sewers; fundamental considerations; design and construction of sewerage works.

## 109B. Design of Water Purification and Sewage Disposal Facilities. (2) II.

Prerequisite: course 111B.

Mr. Gotaas, Mr. Kaufman

Engineering design of water purification and sewage treatment facilities; includes aeration, coagulation, sedimentation, decomposition, filtration, biology, oxidation and disinfecting processes.



- 111A. Water Supply Engineering. (2) I and II.  
Mr. Pearson (in charge), Mr. Gotaas, Mr. Kaufman, Mr. Orlob  
Prerequisite: Mechanical Engineering 103.  
Water supply demands, yields of water sources; design and construction of water works.
- 111B. Chemistry and Biology of Water Purification and Sewage Treatment. (2) I. Mr. Langelier  
Prerequisite: course 123.  
The chemical and biological character of water and sewage; theory of water purification and sewage disposal processes.
112. Elements of Framed Structures. (2) I and II. Mr. Smith, Mr. Pirtz  
Prerequisite: Engineering 18A-18B.  
For students in architecture.  
Analytical and graphical stress analysis for framed structures.
113. Foundations. (2) I and II. Mr. H. E. Davis, Mr. Jameyson, Mr. Seed  
Prerequisite: courses 108A and 135.  
Properties and classification of soils; bearing capacities and lateral pressures. Bridge and building foundations, footings, sheet-piling, piles, cofferdams, open, box, and pneumatic caissons; deep-well dredging.
116. Engineering Relations, Contracts, and Specifications. (2) I and II.  
Mr. Keim, Mr. Horonjeff, Mr. Kelly  
Prerequisite: senior standing in civil engineering.  
Professional duties and privileges; principles of business law; preparation of contracts and contract documents, including specifications and drawings.
120. Introduction to Civil Engineering Problems. (2) I.  
Mr. Pirtz, Mr. Polivka  
One lecture and one drafting period per week.  
Prerequisite: Engineering 22 and 23 or 23D and course 108A (which may be taken concurrently).  
A series of problems illustrating practices in civil engineering design and construction, including terminology detailing, preparation of cost estimates and methods of computation.
123. Sanitary Laboratory. (3) I and II. Mr. Langelier  
Prerequisite: Chemistry 1A-1B.  
Chemical analysis of water and sewage, and the laboratory control of purification and sewage treatment processes.
124. Principles of Sanitary Engineering. (3) II. Mr. Langelier  
Prerequisite: upper division standing in public health, science, or engineering.  
An engineering approach to problems of municipal and rural water supply, sewerage, and waste collection and disposal.
126. Applied Sanitary Science and Municipal and State Sanitation. (2) II.  
Mr. McGahey, Mr. Kaufman  
Prerequisite: course 123 and Public Health 111.  
The science and practice of environmental sanitation in municipal, county, and state departments.
133. Elementary Structural Design. (3) I and II.  
Prerequisite: course 108A. Mr. Bresler, Mr. Lin, Mr. Smith  
Design of steel and timber structural components; structural connections, tension and compression members, and beams.

135. Reinforced Concrete. (2) I and II. Mr. Baron, Mr. Raphael  
 Prerequisite: course 108A.  
 Elementary analysis and design of reinforced concrete beams, slabs, columns, and footings.
136. Structural Analysis and Design of Bridges. (3) I and II. Mr. Jameyson, Mr. Scheffey  
 Prerequisite: courses 107A, 133, and 135.  
 Analysis and design of girder, truss, rigid frame, and continuous bridges with special emphasis on highway bridges. Introduction to moment distribution and its application to analysis of bridges.
137. Structural Analysis and Design of Buildings. (3) I and II.  
 Prerequisite: courses 107A, 133, and 135. Mr. Eberhart, Mr. Penzien  
 Analysis and design of building structures under the action of vertical dead and live loads, and of wind and earthquake forces. Building code and structural requirements in connection with the use of timber, steel frame, reinforced concrete, and brick.
147. Sanitary Engineering Chemistry. (3) II. Mr. Tebbens  
 Prerequisite: course 123 or equivalent.  
 Lectures, demonstrations, and problems concerning the applications of organic chemistry and biological chemistry to water purification, sewage treatment, agricultural and industrial wastes, and sanitation of the industrial environment.
149. Municipal Engineering Services. (2) II.  
 Mr. McGauey, Mr. D. S. Berry  
 Prerequisite: enrollment in a course in City and Regional Planning, or upper division or graduate standing in other fields (except Civil Engineering) and consent of instructor.  
 Study of engineering services from the point of view of planning, development, financing, and organization, with emphasis on the importance of engineering design as related to the comprehensive, long-range planning of urban communities.
151. Hydrology. (2) I. Mr. Todd  
 Prerequisite: Mechanical Engineering 103.  
 Principles involved in determining water supplies and flood flows; application of statistics to hydrologic observations; unit hydrograph, ground water, runoff, storage, and flood-control problems.
161. Hydraulic Laboratory. (2) I and II.  
 The Staff (Mr. Einstein in charge)  
 Prerequisite: Mechanical Engineering 103.  
 An introductory laboratory course which includes experiments on weirs, pipes and channels, spillways, hydraulic jump, model laws, turbines, pumps, and other hydraulic phenomena. Program largely optional.
166. Advanced Hydraulics. (3) II. Mr. Einstein  
 Prerequisite: Irrigation 102A.  
 Nonuniform and unsteady flow in open channels; transportation of sediment; flow in porous material; hydraulic models.
171. Introduction to Traffic Engineering. (3) II. Mr. D. S. Berry  
 Prerequisite: senior standing in engineering and course 106 (may be taken concurrently).  
 Street and highway traffic problems; principles of design of thoroughfares on the basis of operational characteristics; traffic regulation and control.

- \*175. Airphoto Analysis and Interpretation. (3) II. \_\_\_\_\_  
 Prerequisite: senior standing in engineering or geology.  
 Principles of aerial photography and photogrammetry; the use of airphotos in identifying land forms, in locating transportation facilities, and in the interpretation of soil and drainage conditions for highway and airport site selection.
181. Engineering Construction. (3) I and II. Mr. Keim  
 Prerequisite: senior standing in engineering.  
 A study of the construction industry: its development, components, economic importance; fundamental principles that underlie construction practices, methods and equipment, their application and limitations; economic factors involved in planning, organizing, and operating a construction force.
190. Engineering Reports. (2) II. Mr. Kelly  
 Prerequisite: junior standing in civil engineering.  
 Application of written and oral expression to the preparation of technical reports and articles.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Eberhart in charge)  
 Prerequisite: senior standing in engineering.  
 Group study of a selected topic or topics in civil engineering.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Eberhart in charge)  
 Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.  
 Individual study and/or investigation of a subject in civil engineering in which the student has a special interest.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

208. Advanced Soil Mechanics. (3) II. Mr. Seed  
 Prerequisite: courses 108H, 113, and Mechanical Engineering 103.  
 Lectures, reading assignments, laboratory problems, and reports on advanced topics in soil mechanics.
209. Seepage and Earth Dams. (2) II. Mr. Seed  
 Prerequisite: graduate standing.  
 The principles governing the flow of water through soils and their applications in the design of earth dams.
220. Advanced Structural Analysis and Design. (3) I. Mr. Jameyson, Mr. Scordelis  
 Prerequisite: graduate standing.  
 Lectures and computations in the analysis of statically indeterminate structures by moment distribution, column analogy, and other methods; design of building frames for wind and earthquake loadings.
221. Experimental Structural and Stress Analysis. (3) I. Mr. Clough  
 Prerequisite: graduate standing.  
 Lectures and laboratory in the principal experimental methods used for structural and stress analysis, including similitude and loaded models, elastic line models, mechanical and electrical strain gauging, stress coat analysis, analogy methods, and photoelasticity.

\* Not to be given. 1954-1955.

- 222A-222B. Theory and Design of Water and Sewage Treatment. (3-3) Yr.  
Prerequisite: courses 109A and 111A. Mr. Gotaas, Mr. Orlob  
Theory and design of elements of systems for water supply, water purification, sewerage, sewage and refuse treatment and disposal.
225. Advanced Sanitary Engineering Laboratory. (3) II. Mr. Langelier  
Prerequisite: course 123. Program to be arranged in each case.  
Special laboratory problems in analysis of milk, water, sewage, air, and refuse; tests of plant models and commercial apparatus.
- 230A-230B. Advanced Mechanics of Materials. (3-3) Yr.  
Mr. Popov, Mr. Pister  
Prerequisite: graduate standing. Course 230A is not prerequisite to 230B.  
Failure theories; inelastic bending; limit design; thick-walled cylinders; torsion of noncircular elements; design for fluctuating and sustained loads; application of theory of elasticity to some complex states of stress; curved bars; elastic stability; plates; beams on elastic foundations.
231. Dynamics of Structures. (3) II. Mr. Clough  
Prerequisite: Engineering Design 102B, courses 136, 137.  
Analysis of stresses and deflections in structures due to the application of dynamic loads. Approximate and "exact" methods for determining the response of buildings, bridges, frames, etc., to earthquake accelerations, wind gusts, moving loads, bomb blasts, etc.
234. Advanced Reinforced Concrete. (3) II.  
Prerequisite: graduate standing. Mr. Lin, Mr. Bresler, Mr. Scordelis  
Study of shrinkage and plastic flow, elastic and ultimate design of beams, columns, footings, and slabs, unsymmetrical bending, eccentric loads, deflections, torsion, prismatic and cylindrical shells, prestressed concrete simple and continuous beams, and circular tanks.
235. Analysis and Design of Masonry Dams. (3) II.  
Mr. Hotes, Mr. Raphael  
Prerequisite: graduate standing in civil engineering, courses 111A and 135.  
Lecture and design course. Selection of location and type; stability analysis, stress analysis of gravity, arch, multiple-arch, dome, and slab-buttress dams; problems imposed by construction conditions and use of mass concrete.
236. Advanced Bridge Design. (3) I. Mr. Lin  
Prerequisite: courses 136 and 137.  
Design and analysis of advanced bridge structures; bridge approaches; bridge substructures; bridge layouts; bridge economics; bridge specifications; special design problems.
241. Industrial and Agricultural Waste Treatment. (2) II. Mr. Pearson  
Prerequisite: courses 111B and 123.  
Studies of the wastes from industrial and agricultural processes that may be detrimental to watercourses, water supplies, sewerage systems, or the atmosphere; principles and methods of disposal and treatment of important wastes and municipal refuse.
242. Atmospheric Pollution. (3) I. Mr. Tebbens  
Prerequisite: course 123 or equivalent.  
Study of air pollution by gases, fumes, vapors and dusts; nature of polluting materials, and relation of atmospheric conditions to their dispersal; methods of air analysis, standards of and control of pollution, and administrative problems.

243. Advanced Sanitary Engineering Laboratory. (2) II. Mr. Pearson  
Lecture and laboratory.  
Prerequisite: courses 123, 111A, 111B, and 109A.  
Studies on the following unit processes of water and sewage treatment: rapid sand filtration, sedimentation, break-point chlorination, chemical treatment of industrial wastes, sludge digestion, sludge gas analysis, sludge conditioning and filtration, plant efficiency studies and special topics.
261. Advanced Hydraulic Structures Laboratory. (2) II. Mr. J. W. Johnson  
Prerequisite: courses 161 and 275.  
Advanced problems including experimental investigations of hydraulic model laws; experimental hydraulic structure, river and harbor models; studies of flood waves, oscillatory waves, beach erosion and protection, sediment transportation, energy dissipation.
263. Sediment Transport. (3) II. Mr. Einstein  
Lecture and laboratory.  
Prerequisite: course 275.  
Definition and description of sediment, its different types of motion. Mathematical relationships between sediment motion and flow. Design and management of rivers and reservoirs with respect to sediment load.
275. River-Harbor Hydraulics. (3) I. Mr. Einstein  
Prerequisite: Mechanical Engineering 103, and graduate standing.  
The theory underlying the design of hydraulic structures, with particular reference to variable flow, channel waves, tides, transportation of detritus by stream, beach erosion, and the use of hydraulic models.
280. Concrete Construction Practice. (2) I. Mr. Kelly  
Prerequisite: courses 108E, 135, and graduate standing.  
Lectures and seminars. Consideration of broad aspects of concrete construction; technical requirements; selection of materials; control of quality; practices in the construction of dams, highways, airfields, canals, bridges, buildings, hydraulic structures.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.  
The Staff (Mr. Eberhart in charge)  
Prerequisite: graduate standing.  
Group study of selected topics: dynamic behavior of structures, earthquake design, analysis and design of buildings, properties of soils, foundation engineering, microscopy of water and sewage, refuse collection and disposal, advanced sanitary engineering design, and advanced topics in hydraulic engineering.
299. Individual Study or Research. (1-5) I and II.  
The Staff (Mr. Eberhart in charge)  
(Formerly numbered 299A or 299B.)  
Prerequisite: graduate standing.  
Investigation of selected advanced civil engineering subjects.
- Graduate Seminars. (No credit) I and II. The Staff (Mr. Baron in charge)  
Meetings of the staff and graduate students for discussion of current developments and research in various fields of Civil Engineering and Irrigation. Seminars scheduled in each of the following groups: Sanitary, Irrigation and Water Resources, and Structures (including Materials and Soil Mechanics).

## Irrigation

Courses 101, 102A, 102B, 103, 104, 107, and 112 are designed to meet the needs of engineering students. Courses 106, 113 are designed for students in the College of Agriculture. Courses 103, 104, 106, and 113 are also open to students in other colleges.

## UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

101. Irrigation Institutions and Economics. (2) II. \_\_\_\_\_  
 Prerequisite: course 103 or 113.  
 Water rights, irrigation institutions and organizations.
- 102A. Irrigation Engineering. (2) II. \_\_\_\_\_  
 Prerequisite: Mechanical Engineering 103.  
 Investigation and general planning of irrigation systems; conveyance of water; silt problems; design of canals, tunnels, flumes, pipelines, inverted siphons.
- 102B. Irrigation Engineering. (2) I. Mr. Hotes  
 Prerequisite: Civil Engineering 108A and Mechanical Engineering 103.  
 Principles of design of diversion weirs, headworks, wasteways, sand boxes, falls, checkgates, lateral headgates, road crossings, special types of distribution systems, measuring devices.
103. Agricultural Use of Water, and Irrigation Practice. (2) I and II. \_\_\_\_\_  
 Prerequisite: junior standing.  
 Sources of water supply; disposal of irrigation water applied to soil; water requirement of crops; duty of water, preparation of land and methods of irrigation; small pumping plants.
104. Drainage and Flood Protection. (2) II. Mr. Hotes  
 Prerequisite: junior standing and course 103 or 113.  
 Structure of soils and soil water and their relation to drainage; theory and principles of drainage; planning drainage systems; protection of lands against flood and tidewaters; organization of drainage and levee districts; methods of apportionment of assessments.
- \*106. Irrigation Development and Organization. (2) II. \_\_\_\_\_  
 Prerequisite: Economics 1A-1B. For students in colleges other than Engineering.  
 Principles and administration of rights to use of water; organizations for and financing of irrigation developments.  
 During 1954-1955 students may take course 101 as a substitute for course 106.
- \*107. Operation and Maintenance of Irrigation Systems. (2) I. \_\_\_\_\_  
 Prerequisite: course 113 for agriculture students; courses 102A and 103 for engineering students.
112. Irrigation Design. (2) I and II. Mr. Hotes  
 Prerequisite: Civil Engineering 135 and Mechanical Engineering 103.  
 Design of structures such as flumes, drops, inverted siphons, and headgates, with estimates of cost.

\* Not to be given, 1954-1955.

## \*113. Development and Use of Farm Irrigation Water Supplies. (3) I.

Prerequisite: Physics 2A-2B or 4A-4B-4C, Chemistry 1A-1B.

Principles of irrigation relating to use of water in agriculture, including the subjects within the responsibilities of owners of irrigated land as distinguished from engineering features. Open to students in any program of study except civil engineering.

During 1954-1955 students may take course 103 as a substitute for course 113.

198. Directed Group Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Todd in charge)

Prerequisite: senior standing in engineering.

Group study of selected topics. Study groups may be organized in irrigation, drainage, and flood protection.

199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Todd in charge)

Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.

Individual study and/or investigation on a problem normally chosen from a restricted list.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see pages 10)

## 202. Advanced Irrigation Design. (2) I. Mr. Hotes

Prerequisite: course 112.

Design of diversion works, irrigation systems, special hydraulic structures.

## 298. Group Studies, Seminars or Group Research. (1-5) I and II.

Prerequisite: graduate standing. The Staff (Mr. Hotes in charge)

Special studies and problems relating to drainage, reclamation, and flood protection; irrigation institutions and organizations; development and utilization of water supplies.

## 299. Individual Study or Research. (1-5) I and II.

The Staff (Mr. Hotes in charge)

(Formerly numbered 299A or 299B.)

Prerequisite: graduate standing.

Investigation of advanced irrigation, drainage, and flood-protection problems.

## ELECTRICAL ENGINEERING

## UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

## 100A-100B. Electrical Circuits and Machinery. (3-3) Yr. Beginning each semester.

Mr. Robertson (in charge), Mr. Finch,  
Mr. Black, Mr. Brede, Mr. Thal-Larsen

Prerequisite: Mathematics 14A or 4A-4B, Physics 4B.

Required for students in agricultural, industrial, and mechanical engineering.

100A. Voltage generation; circuit constants; single-phase and poly-

\* Not to be given, 1954-1955.

phase circuit analysis; single-phase transformers; polyphase connections of transformers.

100B. Machine windings and induced voltages; synchronous, induction, direct current, and single-phase machines; rectification; electronic tubes and their associated circuits; practical engineering problems.

101. Electrical Engineering. (3) I and II. Mr. Finch, Mr. Johnston  
Open to engineering students not registered in agricultural, electrical, industrial, or mechanical engineering.

Prerequisite: Mathematics 4A, Physics 4B.

Electric power generation, transmission, distribution, and utilization.

- †102. Electrical Engineering Laboratory. (1) I and II. Mr. Johnston  
One three-hour period per week to be arranged. Sections limited to fifteen students.

Prerequisite: course 101, which should be taken concurrently if possible.

Experiments designed to illustrate electrical theory and afford practice in the operation of electrical equipment. Designed to accompany and supplement course 101.

- 103A-103B. Nuclear Accelerators. (2-2) Yr. Mr. Woodyard  
Prerequisite: courses 106 or 100B or 109B or Physics 110B or 121 (may be taken concurrently).

Course 103A is normally prerequisite to 103B. Qualified students may enroll in course 103B without 103A with consent of instructor.

Theory, design, and applications of modern nuclear machines such as d.c. accelerators, betatrons, linear accelerators, cyclotrons, f.m. cyclotrons, and synchrotrons (including bevatron); recent developments; ion sources and vacuum systems; lectures and demonstrations supplemented by field trips to nearby nuclear laboratories.

- 104A-104B. Electrical Laboratory. (1-1) Yr. Beginning each semester.  
The Staff (Mr. Hinrichs in charge)

One three-hour laboratory period per week.

Prerequisite: courses 100A-100B or 110A-110B (may be taken concurrently).

Introductory experiments illustrating principles of design and operation of alternating and direct-current motors and generators, transformers, vacuum tubes, single and polyphase circuits, metering and control equipment.

105. Electrical Measurements in Engineering. (3) I and II.  
The Staff (Mr. Robertson in charge)

Two lectures and one three-hour laboratory period per week.

Prerequisite (may be taken concurrently): course 100A, or 101, or 110A, Mathematics 110A.

Electrical measurements using direct current and low-frequency alternating current. Principles and characteristics of indicating and recording instruments, including oscillographs; potentiometer, bridge, and comparison methods; applications of these in the measurement of temperature, pressure, strain, etc., in various fields of engineering.

106. Basic Electronics. (4) I and II. The Staff (Mr. Woodyard in charge)  
Three lectures and one three-hour laboratory period per week.  
Prerequisite: courses 100A, or 101, or 110A, and 105; Mathematics 110 (may be taken concurrently).

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



Electron emission; motion of charges in electromagnetic fields; electrical conduction in vacuum and through gases; electron tubes, high-vacuum and gas-filled; elementary applications of electronic devices in rectifiers and amplifiers.

109A-109B. Electrical Engineering. (7-7) Yr. Beginning each semester.

Mr. Morton, Mr. Pritchett, Mr. Robertson, Mr. Woodyard

Four lectures, one two-hour problem session, and two three-hour laboratory periods per week.

Prerequisite: Mathematics 110A-110B; Physics 4B.

Electric circuits and circuit analysis; analytical, graphical, and experimental studies of circuits carrying direct, alternating, and transient currents. Magnetic circuits and materials, with applications to inductors and transformers. Electronic and electromagnetic effects and devices. A unified course equivalent to courses 104A-104B, 105, 106, and 110A-110B.

110A-110B. Electric and Magnetic Circuits. (3-3) Yr. Beginning each semester.

Mr. Gier, Mr. Hinrichs, Mr. Bourne, Mr. Hopkin

Prerequisite: Mathematics 14A or 4A-4B, Physics 4B.

110A. Single-phase alternating current circuits.

110B. Polyphase circuits, magnetic circuits, transformer theory.

111A-111B. Electrical Machinery. (3-3) Yr. Mr. McFarland, Mr. Robertson

Prerequisite: courses 109B or 104A-104B, 106 (for 111B only), and 110A-110B. Recommended: Engineering Design 102B.

111A. Polyphase and single-phase induction machines, synchronous machines, direct-current machines.

111B. Synchronous machines, polyphase conversion apparatus, application problems.

116A-116B. Engineering Electronics and Radio Engineering. (3-3) Yr.

Mr. Scott, Mr. Angelakos

Prerequisite: courses 109B or 106 and 110B.

Design and operating characteristics of radio transmitters and receivers for amplitude modulation, frequency modulation, television and radar; propagation of electromagnetic waves and the design of antennas and antenna arrays.

117A-117B. Electromagnetic Fields and Waves. (3-3) Yr.

Prerequisite: courses 109B or 106.

Mr. Angelakos

The mathematics of vector fields, static electric and magnetic fields. Maxwell's equations. Applications to problems in wave propagation, skin effect, wave guides and cavity resonators, electromagnetic radiation, and ultra-high-frequency techniques.

118A-118B. Power System Protection. (2-2) Yr.

Mr. Dalziel

Prerequisite: course 111A (may be taken concurrently).

Symmetrical components, analysis of short circuits, decrement curves, power system protection, instrument transformers, and metering errors.

121. Transient Phenomena. (3) II.

Mr. Robertson

Prerequisite: courses 109B or 100B or 110B, and 104B, Engineering Design 102B.

Physical and mathematical analysis of transient phenomena, primarily in electrical circuits; single, mesh, and coupled circuits; circuit response to varying voltage; general rules and theorems on circuits; equivalent systems; practical applications.

## 122A-122B. Electric Power Transmission and Distribution. (3-3) Yr.

Mr. Bourne

Prerequisite: courses 109B or 110A-110B and Mathematics 110.

Physical concepts of inductance, a-c resistance, capacitance. Development of mathematical expressions for distribution and transmission line parameters. Distribution system studies. Steady-state analysis of long lines. Determination of normal operating characteristics of power systems. Traveling waves, corona, mechanical design.

## 123A-123B. Telephone Engineering. (3-3) Yr. Mr. Matthaei, Mr. Black

Prerequisite: courses 109B or 106 and 110B.

Telephone, telegraph, radio, and television transmission over open-wire, cable, and coaxial lines; design of transmitters and receivers, electrical filters, equalizers, phase distortion correctors, delay circuits, impedance matching circuits, and other electrical networks, and their coordination in communication circuits.

## 126. Industrial Electronics. (4) I and II.

Mr. Sloan

Three lectures and one three-hour laboratory period per week.

Prerequisite: courses 109B or 106 and 110B.

Basic principles of electronic devices and circuits commonly found in industrial applications, including: cold-cathode tubes; thyatron circuits; special power supplies and amplifiers; electronic heating; multivibrator type circuits; interval timers; testing, measurement, and control methods; current electronic developments.

## 127. Elemental Control. (4) I.

Mr. Jury

Three lectures and one three-hour laboratory period per week.

Prerequisite: course 111A (may be taken concurrently) or 100B, 104B; Engineering Design 102B.

Analysis, synthesis, construction and operation of open-loop control systems and control components. General study of control system dynamics, motor controllers, transducers, actuators, amplifiers, output members, sensing devices, relays and switching circuits.

## 128. Feedback Control. (4) II.

Mr. Hinrichs, Mr. Jury

Three lectures and one three-hour laboratory period per week.

Prerequisite: course 111A (may be taken concurrently) or 100B, 104B; Engineering Design 102B; Mathematics 110A-110B; course 127 recommended.

The principles of analysis, synthesis, construction and operation of closed-loop control systems, including steady-state and transient theory, stability criteria, and performance design factors. Illustrations from various engineering fields with emphasis on electro-mechanical systems.

## 132A. Electrical Communications Laboratory. (2) I and II.

The Staff (Mr. Scott in charge)

Prerequisite: courses 109B or 104A-104B and 110A-110B (completed), and 116A (may be taken concurrently).

Experiments illustrating the fundamental principles involved in the operation of communication circuits and electronic devices. Particular consideration is given to the special methods of measurement, and special techniques, which must be employed at high frequencies.

## 132B. Electrical Communications Laboratory. (2) II.

The Staff (Mr. Black in charge)

Prerequisite: courses 116A, 132A and 117A or 123A (completed), 116B and 117B or 123B (to be taken concurrently).

Selected experiments illustrating the fundamentals of electronics and

the generation, propagation, and radiation of electromagnetic energy. Particular consideration is given to the ultra-high-frequency and microwave regions.

133A. Electrical Machinery Laboratory. (2) I and II.

The Staff (Mr. McFarland in charge)

Prerequisite: courses 109B or 104B, 105, 110A-110B, and 111A (may be taken concurrently with 133A).

Selected experiments on direct and alternating current machinery designed to illustrate fundamental principles, applications, and recent developments in electric power machinery.

133B. Advanced Electrical Machinery Laboratory. (2) II.

The Staff (—— in charge)

Prerequisite: courses 133A, 111B (may be taken concurrently).

Advanced experiments on a-c and d-c machinery.

140. Elementary Illumination. (2) I.

Mr. Finch

Prerequisite: consent of instructor, Physics 4C, courses 100A, 101, 109A, or 110A (may be taken concurrently).

Light: its utilitarian and engineering aspects; light, vision, and radiant energy; photometric concepts; illumination instruments and measurements; lighting calculations and design; color specification; lecture and demonstrations.

140L. Elementary Illumination Laboratory. (1) I.

Mr. Finch

Prerequisite: course 140 (may be taken concurrently).

Laboratory experiments in the fundamental concepts and quantities used in illumination: intensity, brightness, illumination, flux, reflection, transmission, light distribution from luminaires, visibility, color, measuring instruments, measuring techniques.

141. Illumination and Radiation Sources and Effects. (2) II.

Mr. Gier

Prerequisite: Physics 4C, courses 100A, 101, 109A, or 110A.

Light sources, luminescence, fluorescence, phosphorescence, ultraviolet radiation, thermal and infrared radiation, solar heating calculations, and design problems. Germicidal, erythematous, and fading properties of ultraviolet radiation. Special problems in infrared transmitters, receivers and applications. Photoelectric effects and photoelectric control and measurement circuits.

141L. Illumination and Radiation Sources Laboratory. (1) II.

Mr. Gier

Prerequisite: course 141 (may be taken concurrently).

Laboratory experiments on the properties and characteristics of light and radiation sources, including: fluorescent, gaseous vapor discharge, incandescent, ultraviolet and infrared sources; techniques for using special radiation measuring instruments such as radiometers, thermopiles, shape factor integrators, integrating spheres, photocells, and spectrophotometers.

142. Lighting Design. (2) II.

Mr. Finch

Prerequisite: course 140; 141 recommended (may be taken concurrently).

Lighting and illumination requirements for job performance and comfort. Conditions for effective seeing for specific tasks. Lighting design and layouts for interior and exterior installations. Utilization of daylight. Interreflection calculations, paneled and louvered ceilings, wiring and control requirements for lighting.

- 151A-151B. Switching and Computing Circuits. (3-3) Yr. Mr. Hoagland  
Prerequisite: courses 106 or 109B.  
The functional and electrical design of switching circuits. Techniques and circuit components for digital information. Applications in high-speed digital computers and in industrial control.
- 152A-152B. Digital Computers. (2-2) Yr. \_\_\_\_\_  
Prerequisite: Mathematics 110 or 119A-119B; 128 recommended.  
Applications of digital computers to mathematical and statistical problems of engineering, business administration, and science. Characteristics of punched-card and electronic computers. Numerical analysis. Elementary programming.
- 153A-153B. Digital Computer Laboratory. (1-1) Yr. \_\_\_\_\_  
Prerequisite: to be taken concurrently with course 152A-152B.  
Experiments in the use of digital equipment.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Morton in charge)  
Prerequisite: courses 109B or 106 and 110B, additional requirements may be specified by the instructor in each group.  
Group study of selected topics in electrical engineering, usually related to new developments. For 1954-1955 studies are planned in transistor circuitry and miniaturization.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Morton in charge)  
Prerequisite: courses 109B, or 106 and 110B. Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.  
Individual study and/or research on a problem chosen by the student and carried out under guidance of an instructor. Enrollment is subject to additional requirements imposed by the instructor concerned.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 200A-200B. Research Literature. (2-1) Yr.  
The Staff (Mr. Hinrichs in charge)  
200A will be offered in both the fall and spring semesters; 200B will be offered in the spring semester only.  
Prerequisite: graduate standing. This course must precede or accompany graduate research in electrical engineering (course 299 should be taken concurrently).  
Individual study of the historical background and present status of research in the field of special interest to each student, culminating in written and oral reports presented to the staff and students of electrical engineering.
206. Theory of High Frequency Tubes. (3) I. Mr. Whinnery  
Prerequisite: courses 116A-116B, 117A-117B, and graduate standing.  
A study of the interchange of energy between electromagnetic fields and various electron streams operating under transit time conditions, with applications to the theory of space-charge controlled tubes, velocity modulation tubes, magnetrons, and traveling wave tubes.

- 210A-210B. Applied Electromagnetic Theory. (3-3) Yr. Mr. Silver  
Prerequisite: courses 117A-117B or Physics 110A-110B.  
Advanced treatment of classical electromagnetic theory and its application to engineering problems. Electrostatics, magnetostatics, time varying fields. Interactions between electromagnetic fields and moving charges.
- \*211A-211B. Electrical Machinery. (3-3) Yr. ———  
Prerequisite: courses 111B and 133B.  
Generalized machine, machines with stationary and moving reference axes, interconnected machines, revolving magnetic fields, generation of emf, current flow in conductors, production of torque, leakage paths and fields; applications of these principles to the theory of existing machines.
216. Antenna Theory. (3) II. Mr. Angelakos  
Prerequisite: course 117A-117B or equivalent.  
Fundamental antenna concepts. Consideration of circuit properties and radiation patterns of linear and loop antennas. Coupled antennas, antenna arrays and reflector-type antennas. Measurement techniques and practices.
217. Microwave Networks. (3) II. Mr. Whinnery  
Prerequisite: courses 117A-117B, 123A-123B, and graduate standing.  
A study of the application of network theory, including the general theorems, the methods of analysis, and the measurement techniques, to microwave guides, cavity resonators, and antennas.
- 218A-218B. Power System Stability. (2-2) Yr. Mr. Dalziel  
Prerequisite: for 218A, course 118A (may be taken concurrently); for 218B, courses 118A, 218A, and 118B (may be taken concurrently); 111A.  
Recommended: courses 111B, 122A-122B.  
Reduction of power networks, steady-state and transient stability limits of power systems.
- \*220A-220B. Electro-Acoustics. (2-2) Yr. Mr. Black  
Prerequisite: Recommended: courses 123A-123B or 117A-117B.  
Analysis of vibrating systems; principles and apparatus involved in the production, propagation, measurement, and reception of sound.
222. Operational Circuit Analysis. (2) I. Mr. Jury  
Prerequisite: course 121.  
Application of operational methods of circuit analysis, in particular the LaPlace Transformation, to systems having lumped or distributed constants.
- 223A-223B. Network Theory. (3-3) Yr. Mr. Matthaei  
Prerequisite: course 123B and Mathematics 185, the latter may be taken concurrently.  
223A. Network analysis utilizing determinants, matrices, the complex frequency plane, the electro-static potential analogy, Fourier and LaPlace transforms as tools. Mathematical properties of two-terminal network impedance functions. Canonical forms for L-C, R-C, and R-L networks.  
223B. General methods for synthesis of 2-terminal networks. Mathematical properties of 4-terminal networks. Realization of transfer functions in passive 4-terminal networks. Synthesis of filter and amplifier transfer functions to meet prescribed performance specifications.
- \*225. Pulse Techniques Laboratory. (1) I. Mr. Mackay  
Prerequisite: seminar on pulse techniques.  
Properties of multivibrators, delay lines, counters, differentiators, and

blocking oscillators, and effects of variation of parameters thereon. Pulse generation, measurement. Proper use of fast oscilloscopes and other measuring devices.

- 226A-226B. Advanced Industrial Electronics. (3-3) Yr. Mr. Sloan  
Prerequisite: course 126.  
Electronic instrumentation and control, heating, metallurgical testing, medical applications, geophysical apparatus, electrolytic processes and calculators.
- 227A-227B. Feedback Control Systems. (3-3) Yr. Mr. Hopkin  
Prerequisite: course 127 or equivalent, Mathematics 185, and course 222, which should be taken concurrently.  
Design criteria, maximization of information-to-noise ratio, design templates for power density spectra, attenuation-phase plane, and s plane. Nonlinear and discontinuous systems, including hysteresis, backlash, and stiction. Pole loci, stability, correlation functions, stabilization by curve prediction, human servo-link.
- 251A-251B. Digital Computer Systems. (3-3) Yr. \_\_\_\_\_  
Prerequisite: courses 151A-151B, 152A (may be taken concurrently).  
Design of digital systems, including over-all planning, combination of functional elements, design of electric circuitry, and planning of tests and check procedures. Analysis and synthesis of switching networks using adaptations of symbolic logic. Design examples, tests and demonstrations.
- \*252A-252B. Applications and Programming of Digital Computers. (2-2) Yr.  
Prerequisite: course 152A-152B. Mr. Morton  
Study of types available, order codes, and checking procedures. Preparation and use of sub-routines libraries. Logical design of computers.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.  
The Staff (Mr. Morton in charge)  
Prerequisite: specific preparation as imposed by instructor in each group.  
Advanced group study in electrical engineering; topics vary from year to year. Seminars will be arranged on research project subjects or new fields open to research; possible topics for 1954-1955 are solid-state electronic devices, information theory, and special machines.
299. Individual Study or Research. (1-5) I and II.  
The Staff (Mr. Morton in charge)  
(Formerly numbered 299A or 299B.)  
Prerequisite: course 200A (may be taken concurrently).  
Investigation of advanced electrical engineering problems.

#### PROFESSIONAL COURSE

400. The Electron Microscope. (1) I and II. Mr. Mackay  
Prerequisite: Physics 2A-2B and 3A-3B, or 4A-4B-4C; Chemistry 1A and 8 or 1B; primarily for persons who expect to use an electron microscope in scientific research.  
General limitations on all microscopes; different types of electron microscopes with their principles, limitations, and capabilities; magnification calibration; vacuum systems and gauges; photographic techniques; specimen preparation, including sectioning, replica production, and shadowing techniques; the practical attainment of high resolving power.

\* Not to be given, 1954-1955.

## ENGINEERING DESIGN

## UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

- 102B. Dynamics. (3) I and II. The Staff (Mr. Meriam in charge)  
Prerequisite: Mathematics 4A-4B, Physics 4A, Engineering 35.  
Kinematics and kinetics of a particle and of rigid bodies as applied to engineering problems. Force, energy, and momentum methods of solution. Introduction to mechanical vibrations.
- 102C. Advanced Mechanics. (3) II. Mr. Meriam  
Prerequisite: course 102B. Mathematics 110A-110B is desirable.  
Advanced methods applied to dynamics problems. Fundamental laws of mechanics; vector algebra; energy methods in statics and dynamics; numerical integration; linear vibrating systems; gyroscopes and their applications. Recommended for students planning graduate study.
106. Machine Design. (4) I and II. The Staff (Mr. Nelson in charge)  
Two lectures and two three-hour laboratory periods per week.  
Prerequisite: Engineering 24, course 102B, and Civil Engineering 108A.  
Application of the principles of mechanics, physical properties of materials, and shop processes to the design of machine parts. Empirical and rational methods are employed.
111. Graphical and Mechanical Computations. (3) I. Mr. Levens  
Two lectures and one hour of supervised computation per week.  
Prerequisite: senior standing in engineering, mathematics, or science.  
Functional scales; theory and construction of nomographic charts for three or more variables; graphical integration and differentiation. Representation and analysis of experimental data.
170. Mechanics of Machinery. (3) I and II. Mr. Garland  
Prerequisite: course 102B and Mathematics 110A-110B.  
Analysis of motions and forces in mechanisms. Introduction to the theory of mechanical vibrations with applications to dynamic balancing, critical speeds, governed systems, and vibration isolation.
171. Design of Mechanical Equipment. (3) I. Mr. Frisch  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 106.  
Application of engineering principles to the design of complete machines. Analysis of curved beams, centrifugal stresses, thermal stresses, and other selected topics. Theoretical and empirical methods. Economic aspects in material selection and processing.
172. Stress Analysis of Machine Parts. (3) II. The Staff (Mr. Cunningham in charge)  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 106, Mathematics 110A-110B, and senior standing in engineering.  
Experimental and theoretical methods for the determination of stresses and deflections in typical machine members. Factors affecting failure and the choice of working stresses. Laboratory experiments making use of brittle lacquers, various types of strain gauges, photoelasticity and other methods.

173. Acoustics of Machinery. (3) II. Mr. Brown in charge  
Prerequisite: course 102B and Mathematics 110A-110B. Recommended: course 170.  
Lectures and demonstrations in the measurement, analysis and correction of noise in machinery installations. Noise transmission through building structures. Sound-proofing. Acoustic filters. Ultrasonic applications.
180. Elements of Analog Computers. (3) I. Mr. Atkinson  
Prerequisite: course 102B or equivalent; Electrical Engineering 100A, 110A, or 101; students majoring in mathematics, physics or chemistry with equivalent background may be admitted at the discretion of the instructor.  
Introduction to analog computers, emphasizing basic elements used in their construction and operation. Representation of fundamental mathematical processes by mechanical, electro-mechanical, electrical and electronic devices. Integrators, differentiators, multipliers, adders, etc. Use of analog laboratory equipment.
198. Group Studies for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Garland in charge)  
Prerequisite: senior standing in engineering, plus particular courses to be specified by the instructor for each group.  
Studies in selected special subjects in the fields of engineering graphics, dynamics, elasticity, analog computing methods, engineering plastics, and design of mechanical equipment.
199. Individual Study or Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Garland in charge)  
Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.  
Individual study or research on a special problem in graphics, dynamics, elasticity, or design of mechanical equipment. Enrollment is subject to consent of an instructor and to the availability of laboratory facilities.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

280. Application of Analogs to Engineering Problems. (3) II. Mr. Atkinson  
Prerequisite: graduate standing in engineering, physics, or mathematics.  
Lectures and demonstrations in the simulation of physical systems by various analogies. Analogs of linear and nonlinear algebraic and differential equations. Membranes, conducting sheets, electrical networks, electronic and mechanical computing devices applied to engineering problems.
- 284A-284B. Advanced Dynamics of Machinery. (3-3) Yr. Mr. Soroka  
Prerequisite: graduate standing. Recommended: course 170.  
Theory of mechanical vibrations. Linear and nonlinear systems. Self-excited vibrations. Methods of Newton, Lagrange, Stodola, and Rayleigh-Ritz applied to complex lumped and distributed systems. Practical approximate methods of analysis.
- 285A. Basic Theory of Elasticity. (3) I. Mr. Meriam  
Prerequisite: graduate standing, differential equations, and strength of materials.  
Fundamental concepts and methods of the mathematical theory of elasticity with application to engineering problems.



- 285B. Advanced Theory of Elasticity. (3) II. Mr. Nelson  
Prerequisite: course 285A.  
A continuation of course 285A including the study of torsion, curvilinear coordinates, three-dimensional problems, flat plates, and other selected topics.
- 287A. Advanced Engineering Dynamics. (3) I. Mr. Goldsmith  
Prerequisite: course 102B or Physics 105B. Mathematics 110A-110B or equivalent; graduate standing in engineering, mathematics or physics. Course 284A-284B recommended.  
Applications of advanced dynamics to engineering problems. Dynamics of constrained systems using generalized coordinates. Lagrange's equations with applications to engineering systems. Resistance to motion. Vibrations about a steady state of motion. Stability of mechanical systems. Wave propagation in elastic and plastic materials.
- 287B. Impact. (3) II. Mr. Goldsmith  
Prerequisite: course 287A. Course 284A-284B recommended.  
Analysis of stress-strain histories and impact loading of beams and plates. A study of the collision of bodies. Applications. Discussion of recent literature.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.  
Prerequisite: graduate standing. The Staff (Mr. Garland in charge)  
Seminars in specialized subjects such as dynamics, elasticity, stress analysis, design of pressure vessels, impact. Different subjects will be offered in successive semesters.
299. Individual Study or Research. (1-5) I and II.  
The Staff ( Mr. Garland in charge)  
(Formerly numbered 299A or 299B.)  
Prerequisite: graduate standing in engineering.  
Investigation of advanced problems in dynamics, elasticity, and design of mechanical equipment.

### MECHANICAL ENGINEERING

#### UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

103. Elementary Fluid Mechanics. (3) I and II.  
The Staff (Mr. Laird and Mr. J. W. Johnson in charge)  
Prerequisite: Engineering Design 102B (may be taken concurrently).  
The principles of mechanics applied to the statics and to the flow of incompressible and compressible fluids.
- 105A. Thermodynamics. (3) I and II.  
The Staff (Mr. Tichvinsky in charge)  
Prerequisite: Chemistry 1B or 8; Physics 4C; Mathematics 4B; Engineering Design 102B (may be taken concurrently).  
Energy transformations, reversibility, availability; thermal properties of gases and vapors. Theoretical cycles and practical engine forms, mechanisms and performance.

## 105B. Thermodynamics. (3) I and II.

Prerequisite: course 105A. The Staff (Mr. Tichvinsky in charge)  
Heat transmission and equipment, fuels, combustion, and analyses of products of combustion. Heat-power engines using nozzles. Reheating and regenerative cycles and equipment. Plant performance.

## 107. Mechanical Laboratory. (3) I and II.

The Staff (Mr. Iversen in charge)  
Prerequisite: courses 105A, 105B, 103. (Courses 105B and 103 may be taken concurrently). For electrical engineering students, courses 105A, 109 may be taken concurrently. For chemical engineering students, Chemical Engineering 144 and 146A, one of which may be taken concurrently.

Experimental work accompanied by calculations and reports on fluid flow, heat transfer, mechanics, combustion, internal combustion and other heat engines and power plants.

## 109. Introduction to Fluid Mechanics and Applied Thermodynamics.

(3) I and II. Mr. Giedt  
Prerequisite: course 105A. Not open to students taking course 103 or 105B.

For students in electrical engineering only.

The elements of mechanics applied to the statics and dynamics of incompressible and compressible fluids. The application of thermodynamics to heat transmission, vapor and gas mixtures, and power cycles.

## 115. Reversed Thermodynamic Cycles and Refrigeration. (3) I.

Mr. Hutchinson  
Prerequisite: course 105B. Not open to students who have taken course 117.

Theory and practice of refrigeration, illustrated by study trips to actual plants.

## 116. Industrial Air Conditioning Methods Economics. (3) II.

Mr. Hutchinson  
Prerequisite: course 105B. Not open to students who have taken course 117.

Theory and practice of air conditioning, illustrated by study trips to actual plants.

## \*117. Combined Refrigeration and General Air Conditioning. (3) I.

Prerequisite: course 105B. Mr. Hutchinson  
Students taking this course may not subsequently take course 115 or 116.

Theory and practice of refrigeration and air conditioning, illustrated by trips to actual plants.

## 118. Industrial Power-Plant Design. (3) II.

Mr. Giedt  
Prerequisite: course 105B.  
Theory and practice of industrial power-plant design and economics. Illustrated by study trips to actual plants.

## 121. Engineering Aerodynamics. (3) II.

Mr. Talbot  
Prerequisite: course 103. Recommended: course 161 or 162.  
Wing characteristics, performance determination, loading conditions, static and dynamic stability and control of airplanes.

\* Not to be given, 1954-1955.

- 123A-123B. Internal Combustion Engines. (3-3) Yr. Mr. Vogt  
Prerequisite: courses 105B, 103, Engineering Design 102B. Recommended: Mathematics 110A-110B.  
Application of the principles of engineering mechanics and thermodynamics to spark ignition and compression ignition engines.
- 123C. Internal Combustion Engines. (3) II. Mr. Oppenheim  
Prerequisite: course 123A.  
Application of the principles of thermodynamics and mechanics to the design and performance analysis of gas turbines and jet propulsion systems and their components.
- 124A-124B. Mechanical Engineering. (3-3) Yr.  
The Staff (Mr. Vogt in charge)  
Prerequisite: courses 103, 105B, Electrical Engineering 100B, 104B, Engineering Design 106 (may be taken concurrently with course 124A).  
Summary of fundamentals of mechanical engineering; analysis of typical engineering problems.
126. Applied Naval Architecture. (3) II. Mr. Schade  
Lecture and laboratory.  
Prerequisite: courses 129A and 129B.  
Preparation of lines and curves of form for a ship of definite requirements, including dimensions, coefficients, displacement and stability under various conditions of loading, power, and propeller requirements. Strength computations and review of classification requirements.
- 128B. Marine Engineering (Machinery). (3) II. Mr. Tichvinsky  
Prerequisite: course 105B, Engineering Design 102B. Recommended: courses 129A and 129B.  
The power requirements and the selection of power plants for various types of vessels and the necessary auxiliaries for steam and motor ships will be considered.
- 129A. Statics of Naval Architecture. (3) I. Mr. Schade  
Prerequisite: course 103 (may be taken concurrently), Civil Engineering 108A, Engineering Design 102B.  
Fundamentals of the geometry of the ship's form, including its presentation in the lines drawings; buoyancy and stability in both intact and damaged conditions; subdivision, freeboard, measurement rules and requirements; grounding and launching; strength and stiffness, including both general concepts of loading systems and determination of scantlings.
- 129B. Dynamics of Naval Architecture. (3) II. Mr. Schade  
Prerequisite: courses 129A (may be taken concurrently) and 103.  
Fundamentals of motions in a sea-way: resistance and means of estimating it, including model testing; propulsion, including propeller design and interactions between ship and propeller; steering and rudder design.
- 131A-131B. Mechanical Engineering Laboratories. (4-4) Yr.  
The Staff (Mr. Seban in charge)  
Prerequisite: courses 103, 105B, Electrical Engineering 104B.  
Engineering applications of the properties of substances, fluid mechanics, heat transfer, and dynamics.
132. Process Unit Operations Laboratory. (4) I. Mr. Farbar  
Prerequisite: courses 103, 105A.  
Laboratory investigations of process unit operations and performance of some process equipment.

143. Motion and Time Study. (3) I and II. Mr. McCauley (in charge)  
Prerequisite: Engineering 41, 42, or 100; Business Administration 140 (may be taken concurrently), Mathematics 130E recommended.  
Principles of motion economy; study of hand motions and their simplification through the use of process charts, micromotion analysis, and workplace design; equipment layout; theory and practice of time study, rating of worker performance, and standard data theory.
145. Tool Engineering. (3) I and II. Mr. Lapsley  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 143 (may be taken concurrently); Engineering 41, Engineering Design 106.  
Admission will be determined by a qualifying examination on the subject matter of Engineering 24, 40, 41, and Engineering Design 106. This examination will be given during registration week.  
The selection of tooling for production; design of tools, jigs, fixtures, dies and production type gauges; design and tooling of automatic machines.
146. Wage Incentives and Job Evaluation. (2) I and II. Mr. Keachie, Mr. McCauley  
Prerequisite: course 143, Business Administration 140, Mathematics 130E recommended.  
Development of wage incentive and job evaluation plans, classification, mathematical and graphical analysis, uses and limitations. The area wage survey, statistical analysis of wage structure. Merit rating and governmental regulations on wages and salaries.
147. Industrial Engineering. (3) I and II. Mr. Keachie, Mr. Grassi  
Two one-hour lectures and one three-hour work period per week.  
Prerequisite: courses 145, 146, Engineering 120, Business Administration 100, 140. (Course 146, Engineering 120, and Business Administration 100 may be taken concurrently.)  
Problems involved in the design and operation of production facilities; product analysis, plant location, plant services, equipment selection, plant design, production planning and scheduling, production control, personnel factors.
151. Industrial Heat Transfer. (3) I and II. Mr. H. A. Johnson, Mr. Drake  
Prerequisite: courses 103, 105B. Recommended: Mathematics 110A-110B.  
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.
152. Industrial Mass Transfer. (3) II. Mr. Snyder, Mr. Stewart  
Prerequisite: courses 105B or 151, 103 or Chemical Engineering 146A.  
Mass transfer processes both with and without simultaneous heat transfer applied to process equipment involving evaporation, evaporative cooling, humidification, dehumidification and gas absorption.
154. Thermodynamics. (3) I. Mr. Oppenheim  
Prerequisite: course 105B or Chemical Engineering 143 and course 103. Recommended: Mathematics 110A-110B.  
Engineering applications of the first and second laws of thermodynamics. Thermodynamics of the pure component and of mixtures and solutions in flow systems, separation processes, combustion reactions, and phase equilibria.

161. Applied Fluid Mechanics. (3) I and II. Mr. Iversen  
Prerequisite: course 103.  
The theory of viscous and turbulent flow with related phenomena; hydraulic machinery (including pumps, fans, compressors, turbines, and hydraulic couplings), similarity criteria and model laws.
162. Elementary Hydrodynamics. (3) I. Mr. Laird  
Prerequisite: course 103 and Mathematics 110A-110B.  
Stream function, potential function, and conformal transformation with applications to engineering problems. Theory and application of viscous and compressible flows.
163. Flow Problems of the Process Industries. (3) II. Mr. Farbar  
Prerequisite: courses 103 and 105A. For chemical engineering students, Chemical Engineering 146A-146B.  
Flow properties of mixtures and suspensions, plastic flow, multiphase flow, materials handling, mixing and pumping equipment.
164. Instrumentation and Automatic Control. (3) I and II. Mr. Thal-Larsen, Mr. Maslach  
Prerequisite: courses 103 or 109, 105B or Physics 112; Engineering Design 102B or Physics 105B. Recommended: Mathematics 110A-110B.  
Descriptive and analytical study of instruments and fundamental mechanical and process control systems.
180. Selection of Process Equipment and Materials of Fabrication. (3) II. Mr. Cornet  
Prerequisite: Civil Engineering 108A, Engineering 40 or Metallurgy 150A, courses 103 and 105A or Chemical Engineering 146A.  
Principles of corrosion. The selection of equipment and its design specification for chemical and petroleum process industry. Consideration of process operating requirements, such as pressure, temperature, corrosion.
198. Directed Group Studies for Undergraduates. (1-5) I and II. The Staff (Mr. H. A. Johnson in charge)  
Prerequisite: upper division standing in engineering.  
Group studies of selected topics which vary from year to year. The program for 1954-1955 may include studies in: Process Plant Equipment Design (I, Maker, Farbar); Principles of Metal Casting (I, Campbell); Principles of Nuclear Engineering (II, Fayram); Design of Pressure Vessels (II, Maker).
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Seban in charge)  
Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.  
Individual study and/or research on a problem chosen by the student and carried out under guidance of an instructor. Enrollment is subject to additional requirements imposed by the instructor concerned.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Graduate standing is required for admission to these courses. In addition, graduate students must have completed at least Mathematics 110A-110B before undertaking any of the following courses, except as noted.

230. Engineering Analysis. (3) I. Mr. Schaaf  
Prerequisite: graduate standing in engineering or Mathematics 110A-110B.  
Methods of theoretical analysis of typical engineering systems. Practice in setting up and solving engineering problems in heat transfer, fluid mechanics, electrical network, mechanical vibrations, and elasticity.
243. Advanced Motion and Time Study. (3) I. Mr. L. E. Davis  
Prerequisite: courses 143, 146, Mathematics 130E (Mathematics 110A-110B not required).  
This course is a continuation on an advanced level of the subject matter presented in course 143; presentation of complex problems of production measurements and methods development; introduction to research techniques in development of fundamental data.
- \*245. Advanced Metal Cutting. (3) I. Mr. Galuzevski  
Prerequisite: course 145 or equivalent. Mathematics 110A-110B not required.  
Theoretical aspects of metal cutting. Chip formation; selection and use of cutting tools; machinability and tool life; heat transfer problems and selection of cutting fluids. Tooling of screw machines. Relation of dimensional control to interchangeable manufacturing.
265. Heat Conduction. (2) I. Mr. Seban  
Prerequisite: courses 151 and 230 (may be taken concurrently).  
Study of steady-state, transient, and periodic problems of heat conduction using both mathematical and numerical methods of solutions. Introduction to problems of thermal stress.
266. Heat Convection. (3) II. Mr. Seban  
Prerequisite: courses 151, 162, and 230.  
Mathematical analysis of convection problems, including boundary layer theory and heat transfer during laminar and turbulent flow. Discussion of allied topics such as boiling, condensation, and mass transfer.
267. Thermal Radiation. (2) I. Mr. Dunkle  
Prerequisite: course 151 (may be taken concurrently).  
The transfer of radiant energy, gaseous radiation, geometrical and spectral characteristics of systems involving thermal radiation.
268. Advanced Problems in Thermodynamics. (3) II. Mr. Grossman  
Prerequisite: course 154.  
An introduction to the statistical thermodynamics of the pure component and of mixtures. The thermodynamics of irreversible phenomena.
271. Theory of Pumping Machinery. (3) II. Mr. Iversen  
Recommended: course 161 or 162.  
The design and performance of all types of pumping machinery.
272. Flow in Porous Media. (3) II. Mr. Putnam  
Recommended: course 162 or Mathematics 270.  
Applications of fluid mechanics and thermodynamics to flow of single-phase and multiphase fluids in porous media, with application to reservoir problems.
276. Mechanics of Real Fluids. (3) II. Mr. Laitone  
Prerequisite: course 230. Recommended: courses 161 and 162.  
Theory of viscous and turbulent flow with applications to fundamental flow problems.

\* Not to be given, 1954-1955.

277. Compressible Fluids. (3) I. Mr. Laitone, Mr. Ipsen  
Prerequisite: course 230. Recommended: course 162 or Mathematics 270.  
Fundamentals of subsonic and supersonic flow, shock waves, different theoretical methods, laboratory equipment, and procedures for supersonic investigations.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.  
The Staff (Mr. H. A. Johnson in charge)  
Advanced study in various fields of mechanical engineering on topics which vary from year to year. The program for 1954-1955 may include: Bearings, Friction, and Lubrication (I, Tichvinsky); Industrial Engineering (II, DeGarmo); Principles of Combustion (II, Starkman, Oppenheim); Vacuum Systems Design (II, Maslach); Theories of Ship Structures Design (II, Schade); Furnace Design (II, Maker); Press Working of Metals (I, Thomsen); Rarefied Gas Dynamics (I, Schaaf).
299. Individual Study or Research. (1-5) I and II.  
The Staff (Mr. Seban in charge)  
(Formerly numbered 299A or 299B.)  
Prerequisite: graduate standing.  
Investigation of advanced mechanical engineering problems.

Technical Hydrodynamics (see Mathematics 270).

#### MINERAL TECHNOLOGY

##### Ceramic Engineering

##### UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

100. The Ceramic Industry. (2) II. Mr. Pask  
Prerequisite: junior standing in engineering, chemistry, geology, or physics.  
Survey of technology and economics of ceramic or non-metallic industries including structural clay products—building materials; refractories—high temperature resistant materials; whitewares or pottery including porcelains, earthenware, tiles; clays; porcelain enamels—glass coatings on metals; cements; and artificial abrasives.
161. Ceramic and Non-Metallic Engineering Fundamentals. (3) I.  
Prerequisite: Chemistry 1A, 1B, Physics 4A, 4B, 4C. Mr. Pask  
Clay minerals, structure, cation exchange and effect upon viscous and plastic properties. Effect of heat on clay and other non-metallic minerals. Applications of phase rule diagrams to vitrification and high temperature reaction studies. Properties of glass and other ceramic or non-metallic products.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Pask in charge)  
Prerequisite: course 161 or consent of instructor.  
Ternary phase diagrams applied to non-metallic systems. Drying theory. Problems of drying and firing products. Effect of physical and chemical properties of raw materials upon products. High temperature reactions. Bodies and glazes. Vitreous porcelain enamels.

199. Individual Studies or Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Pask in charge)

Prerequisite: enrollment limited to senior students in engineering, chemistry, geology, or physics whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.

Individual research studies pertaining to properties and utilization of non-metallic minerals and to the problems of the different divisions of the ceramic industry.

#### GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

271. Refractories. (2) I. Mr. Pask

Prerequisite: course 161 or consent of instructor.

Types of refractories. Raw materials and technical problems of manufacture. Fundamental theories in regard to fusion or refractoriness, thermal shock resistance, spalling resistance, thermal conductivity, load bearing capacity at high temperatures. Consideration of applications of refractories based on these properties.

298. Group Studies, Seminars, or Group Research. (1-5) I and II.

The Staff (Mr. Pask in charge)

Prerequisite: graduate standing and consent of instructor.

Principles of crystal chemistry and their application to ceramics. Formation, structure and physical properties of glasses. Advanced studies of high temperature reactions. Physical, thermal, and electrical properties of materials. Theory and practice of ceramic-to-metal bonding.

299. Individual Study or Research. (1-5) I and II.

The Staff (Mr. Pask in charge)

(Formerly numbered 299A or 299B.)

Prerequisite: graduate standing.

Research problems pertaining to clay technology, non-metallic mineral technology in general, and certain problems incidental to the manufacture of ceramic products, primarily of structural clay products, refractories and whitewares; and to glass-to-metal bonding.

#### Metallurgy

##### LOWER DIVISION COURSES

The basic prerequisite for all lower division courses is, in addition to the prerequisites noted, the completion of the Engineering Examination, Lower Division.

- 2A. Metallurgical Analysis. (3) I. Mr. Mitchell

One lecture and two three-hour laboratory periods.

Prerequisite: Chemistry 1B with grade C or higher.

Quantitative analysis of ores, metals, and metallurgical products.

- 2B. Metallurgical Analysis. (2) II. Mr. Mitchell

One lecture and one three-hour laboratory period.

Prerequisite: course 2A or Chemistry 5.

Fire assaying of ores and metallurgical products for gold and silver and fire methods of assay for some of the base metals.

##### UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and the completion



of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

- 100A-100B. Extractive Metallurgy. (3-3) Yr. Mr. Ravitz  
Prerequisite: Chemistry 1B, Physics 4C.  
Theory and practice of the unit processes involved in the extraction of metals from their ores; roasting, smelting, refining, leaching, electrolysis, and related processes; material and energy balances and other metallurgical calculations.
108. Mineral Dressing. (3) I. Mr. Mitchell  
Prerequisite: junior standing in engineering, chemistry or geology.  
A systematic study of the unit operations of mineral dressing including crushing and grinding, sizing, gravity concentration, flotation, magnetic and electrostatic separation, thickening and filtration; economics of mineral dressing.
- 110A. Mineral Dressing Laboratory. (2) II. Mr. Mitchell  
Prerequisite: course 108.  
Laboratory experiments in the unit operations involved in mineral dressing; crushing, sampling, grinding, screening, classification, gravity concentration, flotation. Quantitative work on the separation and recovery of the valuable minerals from ores and on mineral dressing microscopy.
- 110B. Mineral Dressing Laboratory. (2) I. Mr. Mitchell  
Prerequisite: course 110A.  
Continuation of course 110A. Applications of mineral dressing unit operations and processes to the treatment of ores. Design of flow sheets.
111. Metallurgical Unit Operations Laboratory. (2) I. Mr. Ravitz, Mr. Mitchell  
Lecture and laboratory.  
Prerequisite: Chemical Engineering 146A or Mechanical Engineering 103.  
Selected bench and pilot plant scale experiments on the unit operations employed in the beneficiation of mineral raw materials: sampling, crushing, grinding, classification, screening, thickening, filtration, gravity and magnetic concentration, flotation.
118. Extractive Metallurgy Laboratory. (2) II. Mr. Ravitz  
Prerequisite: course 100B or consent of instructor.  
Fundamental metallurgical measurements: pyrometry, calorimetry, gas analysis, gas flow, hydrogen ion concentration, etc. Experiments in roasting, smelting, refining, and electrolysis. Determination of weight and heat balance of a furnace.
120. Advanced Extractive Metallurgy. (3) I. Mr. Ravitz  
Prerequisite: course 100B, Chemistry 110B or 109.  
Advanced study of the production of iron and steel and the major non-ferrous metals; engineering, physical-chemical, and economic principles concerned.
140. Metallurgical Thermodynamics. (3) I. Mr. Ravitz  
Prerequisite: Chemistry 110B and senior standing.  
The principles of thermodynamics with emphasis on application to metallurgical problems.
- 150A. Physical Metallurgy. (3) I. Mr. Hultgren  
Two lectures and one three-hour laboratory period.  
Prerequisite: Chemistry 1B, Physics 4B, 4C.  
Relationships between microstructure, composition, heat and mechanical treatment, and physical properties of metals and alloys; the

metallic state, phase diagrams and interpretation of microstructures from them; deformation and recrystallization of metals, metallography, and heat treatment of iron and steel.

- 150B. Physical Metallurgy. (3) II. Mr. Hultgren  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 150A or Engineering 40 and course 152.  
A continuation of course 150A. Ternary phase diagrams and alloy steels, cast iron, X-ray metallography, physical properties of metals and the periodic table, metallography of the nonferrous metals.
152. Physical Metallurgy. (1 or 2) I. Mr. Hultgren  
Prerequisite: Chemistry 1B, Physics 4B, 4C.  
The lecture part of course 150A. Students who have taken Engineering 40 will receive only 1 unit of credit.
- 152L. Physical Metallurgy Laboratory. (1) I. Mr. Hultgren  
Prerequisite: open only to students who have had course 152 in a previous year.  
The laboratory part of course 150A.
154. Advanced Metallography. (3) II. Mr. Washburn  
Prerequisite: courses 150A, 150B.  
Advanced laboratory work in metallography, including the synthesis, heat treatment, and metallographic study of alloys; theory and practice of photomicrography. Occasional lectures, conferences, and outside reading. The student is encouraged to pursue projects in the line of his particular interest.
160. X-ray Metallography. (3) I. Mr. Parker  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 150A or Engineering 40 and course 152.  
Generation of X rays and the application of X-ray diffraction to the study of metals and alloys; phase diagram determination, particle size, internal stresses, cold work, recrystallization, preferred orientation; crystal structure determinations and phase identification.
170. Plasticity and Metal Forming. (3) I. Mr. Dorn  
Prerequisite: Civil Engineering 108A.  
The theory of plasticity and the plastic forming of metals.
171. Mechanical Metallurgy. (3) II. Mr. Dorn  
(Formerly numbered 170A.)  
Prerequisite: Courses 150A (or Engineering 40) and 170.  
An analysis of the effects of structure on the mechanical properties of metals.
172. Inspection of Metals. (2) I. Mr. Washburn  
Prerequisite: course 150A or Engineering 40.  
Lectures and laboratory instruction on the industrial techniques for inspection of metals; the principles and application of visual inspection, macrography, magnetic, and fluoroscopic methods of testing; the theory of X-ray radiography and its application to metal inspection.
- †174. Metallic Reaction Rates. (3) II. Mr. Dorn  
Prerequisite: course 150A (or Engineering 40 and course 152) and Chemistry 110A-110B. Recommended: Mathematics 110A-110B.  
A study of the application of the principles of kinetics of metallurgical reactions, diffusion, and heat transfer to the problems of casting, heat treating, and welding of metals.

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

176. Metallurgy of Welding. (3) II. Mr. Parker  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 150A or Engineering 40.  
Metallurgical problems associated with welding. The influence of welding technique on the metallurgical structures and properties of welds. A study of the origin and effect of weld defects.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Hultgren in charge)  
Prerequisite: senior standing in engineering.  
Group study of selected topics.
199. Individual Study or Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Hultgren in charge)  
Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- †202. Metallurgy of the Less Common Metals. (2) II. Mr. Ravitz
- †210A-210B. Metallurgical Investigation. (2 or 3; 2 or 3) Yr.  
Program of work and credit to be arranged. Mr. Mitchell, Mr. Ravitz  
Prerequisite: course 110B.
- \*240. Metallurgical Thermodynamics. (3) II. Mr. Kelley  
Prerequisite: course 140 or Chemistry 114H.  
Thermodynamic properties of metallurgical substances and their application to heat balances and reaction equilibria in extractive metallurgical processes.
250. Physics of Metals. (3) I. Mr. Hultgren  
A theoretical study of the metallic state emphasizing those properties of technologic importance; chemical bonding forces, crystal structures of metals and alloys, compressibility, specific heat, magnetism, electrical and thermal conductivity, thermodynamics.
- †256. Reaction Kinetics in Metals. (3) II. Mr. Dorn  
Prerequisite: course 150A and Chemistry 110A-110B.  
Introduction to the application of statistical mechanics to reaction kinetics in metallic systems. Special emphasis will be given to analytical treatment of recrystallization, phase transformations including decomposition of austenite and precipitation hardening, diffusion in metals, and the hardenability of steels.
260. Properties of Single Metal Crystals. (3) II. Mr. Washburn  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 160 and graduate standing.  
Preparation of metallic single crystals, stress strain relationships for crystals having different orientations, theories of strain hardening, internal friction, magnetic properties, preferred orientation in polycrystalline materials, orientation determination and pole figures, relation between properties of single crystal and polycrystalline materials.
298. Group Studies, Seminars, or Group Research. (1-5) I and II. The Staff (Mr. Hultgren in charge)

\* Not to be given, 1954-1955.

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

299. Individual Study or Research. (1-5) I and II.  
 The Staff (Mr. Hultgren in charge)  
 (Formerly numbered 299A or 299B.)  
 Prerequisite: graduate standing.

Research Conference in Physical Metallurgy. (No credit) I and II.  
 The instructing staff and graduate students meet once a week to discuss research and advanced subjects.

### Mining

#### LOWER DIVISION COURSE

The basic prerequisite for all lower division courses is, in addition to the prerequisites noted, the completion of the Engineering Examination, Lower Division.

1. Mine Surveying. (3) II. Mr. Shaffer  
 (Formerly numbered 151.)  
 Prerequisite: Engineering 1A.  
 Surface and underground mine surveys. Preparation of mine maps.

#### UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

101. Introduction to Mining. (2) I. Mr. Shaffer  
 Prerequisite: Geology 1, Mineralogy 4B or 6, Mathematics 4A.  
 Raw materials, beneficiation of raw materials, marketing products; organization of the industry. Elements of mining, prospecting, sampling; breaking and supporting ground; haulage, drainage, ventilation; driving of development workings.
103. Mining Practice. (3) II. The Staff (Mr. Shaffer in charge)  
 Prerequisite: course 101.  
 Mining operations that embody all of the common methods of mining are analyzed by means of case histories of actual operating mines. Each is considered from its discovery to the present, with emphasis on changes in mining techniques used.
- 105A. Mining Machinery and Equipment. (3) I. \_\_\_\_\_  
 Two lectures and one three-hour laboratory period per week.  
 Prerequisite: Engineering 35, Electrical Engineering 101, Mechanical Engineering 103, 105A or Chemistry 110B.  
 Air compression, transmission and utilization. The performance of fans, blowers, and pumps. Resistance of ducts and other airways.
- 105B. Mining Machinery and Equipment. (3) II. \_\_\_\_\_  
 Two lectures and one three-hour laboratory period per week.  
 Prerequisite: course 105A.  
 Rock drills, explosives, mine transportation, drainage, hoisting, ventilation, dust, and noxious or otherwise objectionable gasses in the mine atmosphere.

- 107A. Economics of Mineral Industry. (2) I. Mr. Trask  
Prerequisite: course 101, Geology 106A and 108.  
Mining as a business. Organization of companies; financing. Federal and state regulation. Principles of investment and risk; efficiency, cost (including taxation). Redemption of capital. Marketing of products. Trends of demand, production, consumption, prices.
- 107B. Valuation of Mines. (3) II. Mr. Wisser  
Prerequisite: courses 101 and 107A.  
Valuation of prospects and developed mines. In the case of the latter: measurement or ore supply; estimations of probable costs and profits, present value of profit in sight. Geological and economic factors in mine valuation.
109. Mine Economic Analysis and Reports. (3) II. Mr. Shaffer  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: courses 103 and 107A.  
Principles of engineering economic analysis applied to exploration, development, operation, and valuation of mineral deposits. Each analysis will be presented by the student as a formal report.
- 111A-111B. Mineral Exploration—Metalliferous. (3-3) Yr. Mr. Wisser  
Prerequisite: course 101, Geology 102A-102B, 103, and 106A, or senior standing in geology.  
Methods of exploring for commercial mineral deposits: geologic mapping, sampling, exploratory drilling, geophysical methods. Assembly and analysis of data secured. Structural analysis of mineralized districts from the standpoint of the mechanics of rock deformation; application to the search for valuable minerals.
113. Mine Rescue and First Aid. (1) II. Evening classes (for opening dates see official bulletin board).  
— and the U. S. Bureau of Mines Safety Station Staff  
Open only to upper division students in the mining, petroleum engineering, and metallurgy programs of study.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Shaffer in charge)  
Prerequisite: upper division standing in engineering or consent of instructor.  
Group study of selected topics.
199. Individual Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Shaffer in charge)  
Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 201A-201B. Investigations in Mining Practice. (2-3; 2-3) Yr. The Staff (Mr. Shaffer in charge)  
Program of work and credit arranged.  
Instruction on the analysis, design, and development of mining systems. Applications of methods of modern physics and electronics to mining and mineral exploration. Open to advanced students in geology and physics, as well as mining.

- 203A-203B. Tectonic Analysis of Ore Districts. (2-2) Yr. Mr. Wisser  
Prerequisite: graduate standing and consent of instructor.  
Principles of deformation in the earth's crust; classification of ore districts according to type of deformation with which they are associated. Interrelation of mechanics of deformation with those of ore deposition. Application to search for new mining districts.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.  
Prerequisite: graduate standing. The Staff (Mr. Shaffer in charge)
299. Individual Study or Research. (1-5) I and II.  
The Staff (Mr. Shaffer in charge)  
(Formerly numbered 299A or 299B.)  
Prerequisite: graduate standing.

### PETROLEUM ENGINEERING

#### UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study, and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

100. Petroleum Engineering Fundamentals. (3) II. Mr. Carlson  
Two lectures and one three-hour laboratory period.  
Prerequisite: upper division standing in engineering and consent of instructor.  
Study of the character and properties of petroleum reservoir rocks, reservoir fluids and the mass properties of subsurface formations.
101. The Petroleum Industry. (2) I. \_\_\_\_\_  
Prerequisite: upper division standing in engineering, business administration, geology, chemistry, physics, or consent of instructor. May not be taken for credit by petroleum engineering majors.  
A general survey of the technology and economics of the petroleum and natural gas industry. Designed for non-petroleum engineering majors.
- ‡110A. Petroleum Engineering—Development. (4) I. \_\_\_\_\_  
Prerequisite: course 100; course 120A must be taken concurrently.  
A brief survey of the principles and methods of petroleum exploration and development, followed by detailed analyses of selected problems involved in locating and defining the petroleum productive reservoir and the drilling and completion of wells.
- ‡110B. Petroleum Engineering—Production. (4) II. Mr. Putnam  
Prerequisite: course 110A; 120B must be taken concurrently.  
Analysis of petroleum reservoir performance, production performance of oil and gas wells, surface handling and preliminary processing of petroleum, economic analysis of petroleum production.
- ‡120A. Petroleum Engineering Laboratory. (3) I. Mr. Somerton  
Prerequisite: course 100; course 110A must be taken concurrently.  
Laboratory, drafting and design problems in oil field development.  
Companion course to 110A.

- ‡120B. Petroleum Engineering Laboratory. (3) II. Mr. Somerton  
Prerequisite: course 120A; course 110B must be taken concurrently.  
Laboratory and analysis problems in petroleum production. Companion course to 110B.
- 121A. Oil Field Development. (3) I. ———  
Prerequisite: course 117.  
Petroleum exploration; principles of oil field development; methods of drilling and controlling oil and gas wells.
- 121B. Petroleum Production Methods. (3) II. ———  
Prerequisite: course 117.  
Exploitation of oil fields; drainage of petroleum from its reservoir rocks; methods of extracting oil from wells; separation of water, sand, and gas from oil; transporting and storing petroleum.
- 123A. Petroleum Engineering Laboratory. (3) I. Mr. Carlson, Mr. Putnam  
Prerequisite: courses 117 and 119; complementary to course 121A, which should be taken concurrently.  
Investigation of special problems in oil field development; laboratory studies of core samples from drilling wells, drilling fluids, oil well cements, oil well surveying instruments and methods, logging techniques and analysis of ground waters associated with oil deposits.
- 123B. Petroleum Engineering Laboratory. (3) II. Mr. Somerton  
Prerequisite: courses 117 and 119; complementary to course 121B, which should be taken concurrently.  
Investigation of special problems in petroleum production; laboratory studies of petroleum reservoir conditions and behavior, primary and secondary production methods, handling of oil at the surface. Field trips to oil-producing properties.
127. Oil Field Mapping Practice. (2) I. Mr. Carlson  
Lecture and laboratory.  
Prerequisite: course 121A (may be taken concurrently) and Engineering 1A, 1B, 22, 23 or 23D.  
Preparation of field and property maps and well logs; development of geologic sections and structure—contour maps and models from well log data.
- \*129. Natural Gas Technology. (2) I. Mr. Somerton  
Prerequisite: course 117.  
Control and management of gas wells; valuation of gas-producing properties; metering, compression, and transmission of natural gas; its domestic, industrial, and chemical utilization; extraction and manufacture of gasoline from natural gas; cycling and condensate production.
- 131A–131B. Oil Reservoir Engineering. (2–2) Yr. Mr. Miller  
Prerequisite: Mechanical Engineering 103, 105A or Chemistry 109, Mathematics 110A–110B.  
Characteristics of naturally occurring underground petroleum-productive reservoirs and their associated fluids (oil, gas, and water). Fluid behavior in porous media and applications of fluid mechanics and thermodynamics to oil-reservoir performance problems.
198. Directed Group Studies for Advanced Undergraduates. (1–5) I and II.  
The Staff (Mr. Putnam in charge)  
Prerequisite: senior standing in engineering.  
Group study of selected topics.

\* Not to be given, 1954–1955.

‡ Not to be given, 1954–1955; to be given, 1955–1956.

199. Individual Study or Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Putnam in charge)

Enrollment limited to senior students in engineering whose scholastic records show a scholarship average of B or higher or whose records indicate a capacity for independent study.

#### GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 207A. Fundamentals of Reservoir Engineering. (2) I. Mr. Putnam  
Prerequisite: Mathematics 110 and Chemistry 109 or Mechanical Engineering 154.

Thermodynamic, volumetric, and phase behavior of reservoir fluids. Characteristics and properties of reservoir rocks. Fundamentals of multi-phase fluid flow in porous media.

- 207B. Fundamentals of Reservoir Engineering. (2) II. Mr. Putnam  
Prerequisite: Mathematics 110. Recommended: course 207A, Mechanical Engineering 162 or 272.

Advanced topics in oil and gas reservoir mechanics including material balance procedures, reservoir performance studies, cycling, water and gas drives, and gravity drainage.

- †209A. Seminar in Petroleum Processing. (2 or 3) I. Mr. Carlson  
Prerequisite: course 119 and completion of program of study in process engineering or chemical engineering.

Modern petroleum refinery practice. Technology of petroleum processing. Plant operation.

- †209B. Seminar in Petroleum Processing. (2 or 3) II. Mr. Carlson  
Prerequisite: course 209A or consent of instructor.

Evaluation of crude oils, raw stocks, and finished products. Study of factors which determine plan of processing in a petroleum refinery.

213. Valuation of Oil- and Gas-Producing Properties. (2) II. ———  
Prerequisite: courses 121A and 121B.

A study of the physical and economic factors underlying the appraisal of oil-producing properties. Estimation and evaluation of oil and gas reserves.

298. Group Studies, Seminars, or Group Research. (1-5) I and II.  
Prerequisite: graduate standing. The Staff (Mr. Putnam in charge)

299. Individual Study or Research. (1-5) I and II.  
The Staff (Mr. Putnam in charge)

(Formerly numbered 229A or 229B.)  
Prerequisite: graduate standing.

#### TRANSPORTATION ENGINEERING (Including Traffic Engineering)

##### UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

See Civil Engineering 101, 102A-102B, 104, 105, 106, 108E, 108G, 108H, 113, 136, 171 for other upper division courses relating to transportation.

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



190. Traffic Engineering for Police. (2) II. Mr. Kennedy  
Prerequisite: upper division standing and one course in statistics or consent of instructor.  
Engineering studies of traffic volumes, speeds, parking, and accidents, and analysis of data in applying traffic signs, signals, and markings, and other traffic regulations. Driver behavior and limitations. Characteristics of vehicle operations. For majors in police administration and public administration.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. D. S. Berry in charge)  
Prerequisite: senior standing in engineering.  
Group study of selected topics in transportation engineering.
199. Individual Study or Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. D. S. Berry in charge)  
Enrollment limited to senior students in engineering with a scholarship average of B or higher.  
Individual study or research of approved projects in transportation engineering.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Highway Planning and Economics. (3) I. Mr. Moyer  
Prerequisite: graduate standing in engineering. Undergraduates in certain programs of study may be admitted.  
A comprehensive study of highway planning surveys, methods, and results; application of results of planning surveys in programming highway improvements; economic analysis of highway improvements; urban traffic studies and planning urban street improvements; parking and zoning studies; highway finance.
202. Advanced Highway Design. (3) II. Mr. Moyer  
Prerequisite: graduate standing in engineering. Undergraduates in certain programs of study may be admitted.  
An advanced study of the location and design of various types and classes of highways. Emphasis is placed on advanced theory and practice in the design of alignment; highway cross sections, intersections, interchanges, multi-lane expressways and arterial highways in urban areas.
210. Traffic Engineering. (3) I. Mr. D. S. Berry  
Prerequisite: graduate standing in engineering, except when special provision is made for students in certain programs of study.  
Analysis of basic characteristics of traffic movement, such as volumes, speeds, origins and destinations, delays, road capacity, and accidents. Techniques for making traffic engineering investigations.
- 210L. Traffic Engineering Laboratory. (1) I. Mr. D. S. Berry  
Prerequisite: course 210 (may be taken concurrently).  
Field and laboratory practice in making traffic engineering investigations and analysis of data. Vehicle performance.
211. Traffic Engineering: Operations. (3) II. Mr. D. S. Berry  
Prerequisite: graduate standing in engineering, except when special provision is made for students in certain programs of study.  
Theory and practical application of street and highway traffic engineering restrictions and uniform traffic control devices. Parking control and public transit planning. Traffic engineering administration.

220. Highway and Airport Pavements. (3) I. Mr. Horonjeff  
Prerequisite: graduate standing in engineering.  
An advanced study of the theories, principles, and practices in the design, construction, and maintenance of highway and airport pavements, including soil stabilization, design of rigid and flexible pavements, accelerated traffic and loading tests, and the design of asphaltic mixtures.
270. Airport Engineering. (3) II. Mr. Horonjeff  
Prerequisite: graduate standing.  
Survey of the functions of government agencies in airport planning and the financing of public airports; evaluation of community airport requirements; factors covering the selection of airport sites; air traffic control and its effect on airport design; airport design requirements with respect to runways, taxiways, terminal area, drainage, and lighting.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.  
The Staff (Mr. D. S. Berry in charge)  
Prerequisite: graduate standing.  
Seminars or integrated group studies in selected advanced subjects in transportation engineering; such as highway policy, administration, finance, materials, public transit, air transport policy and administration.
299. Individual Study or Research. (1-5) I and II.  
The Staff (Mr. D. S. Berry in charge)  
(Formerly numbered 299A or 299B.)  
Prerequisite: graduate standing.  
Research or investigation in selected advanced subjects in transportation engineering.

## ENGLISH

(Department Office, 2125 Dwinelle Hall)

- Myron F. Brightfield, Ph.D., *Professor of English.*  
Arthur G. Brodeur, Ph.D., *Professor of English and Germanic Philology.*  
Bertrand H. Bronson, Ph.D., *Professor of English.*  
James R. Caldwell, Ph.D., *Professor of English.*  
James M. Cline, Ph.D., *Professor of English.*  
Willard E. Farnham, Ph.D., *Professor of English (Chairman of the Department).*  
James D. Hart, Ph.D., *Professor of English.*  
Charles W. Jones, Ph.D., Litt.D., *Professor of English.*  
Benjamin H. Lehman, Ph.D., *Professor of English.*  
Josephine Miles, Ph.D., *Professor of English.*  
Mark Schorer, Ph.D., *Professor of English.*  
Henry N. Smith, Ph.D., *Professor of English.*  
<sup>2</sup> George R. Stewart, Ph.D., *Professor of English.*  
Willard H. Durham, Ph.D., *Professor of English, Emeritus.*  
Walter M. Hart, Ph.D., LL.D., *Professor of English, Emeritus.*  
Bertrand Evans, Ph.D., *Associate Professor of English and Education.*  
Arthur E. Hutson, Ph.D., *Associate Professor of English.*  
\*John E. Jordan, Ph.D., *Associate Professor of English.*  
\*James J. Lynch, Ph.D., *Associate Professor of English.*  
Gordon McKenzie, Ph.D., *Associate Professor of English (Vice-Chairman of the Department).*

<sup>2</sup> In residence spring semester only, 1954-1955.

\* Absent on leave, 1954-1955.

Thomas F. Parkinson, Ph.D., *Associate Professor of English.*

<sup>1</sup> John H. Raleigh, Ph.D., *Associate Professor of English.*

Wayne Shumaker, Ph.D., *Associate Professor of English.*

Jonas A. Barish, Ph.D., *Assistant Professor of English.*

Travis M. Bogard, Ph.D., *Assistant Professor of English.*

Everett Carter, Ph.D., *Assistant Professor of English.*

Albert S. Cook, Jr., M.A., *Assistant Professor of English.*

John H. Edwards, Ph.D., *Assistant Professor of English.*

<sup>2</sup> William Frost, Ph.D., *Assistant Professor of English, Santa Barbara.*

\* Sears R. Jayne, Ph.D., *Assistant Professor of English.*

Harold D. Kelling, Ph.D., *Assistant Professor of English.*

† Charles S. Muscatine, Ph.D., *Assistant Professor of English.*

David W. Reed, Ph.D., *Assistant Professor of English.*

Ernest Tuveson, Ph.D., *Assistant Professor of English.*

Ian P. Watt, M.A. (Cantab.), *Assistant Professor of English.*

Frank D. Dollard, Ph.D., *Instructor in English.*



William J. Brandt, M.A., *Lecturer in English.*

Charles B. Brooks, M.A., *Lecturer in English.*

Robert M. Jordan, M.A., *Lecturer in English.*

Burton O. Kurth, M.A., *Lecturer in English.*

Leo B. Levy, Ph.D., *Lecturer in English.*

Eugene E. Zumwalt, M.A., *Lecturer in English.*

Students must have passed Subject A before taking any course in English.

*Letters and Science List.*—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Bogard, Chairman; Mr. Jones, Mr. Kelling, Mr. Parkinson, Mr. Reed, Mr. Shumaker.

The department offers alternative programs for the major: a program for the student who intends to become a candidate for the M.A. or the Ph.D. degree in English; a program for the general undergraduate.

Plan I. The program for the general undergraduate is as follows:

(A) *Preparation for the Major.*—First Year—Required: course 1A-1B (3-3), Composition and Study of Literature. Second Year—Required: course 46A-46B (3-3) and 3 additional units to be elected from courses 25 (3), 30 (3), 41 (3), 44A-44B (3-3), 49 (3).

(B) *The Major.*—Twenty-four units of upper division work with specific requirements as follows: Third Year—Required: the Junior Course, English 100 (3); Methods and Materials of Literary Criticism. Fourth Year—Required: the Senior Course, English 151 (3).

The total program (lower and upper division) must include at least: 3 units in Chaucer or the Age of Chaucer, 3 units in Shakespeare, 3 units in the Age of Milton (English 158B) or 3 units in Milton and Donne, 3 units in American Literature, 3 units in a period or type course.

Plan II. The program for the undergraduate expecting to proceed to the M.A. or Ph.D. degree in English is as follows:

(A) *Preparation for the Major.*—First Year—Required: course 1A-1B (3-3), Composition and Study of Literature.

<sup>1</sup> In residence fall semester only, 1954-1955.

<sup>2</sup> In residence spring semester only, 1954-1955.

\* Absent on leave, 1954-1955.

† Sabbatical leave in residence, fall semester, 1954-1955.

(B) *The Major*.—Twenty-four units of upper division work, with specific requirements as follows: Third Year—Required: the Junior Course, English 100 (3). Fourth Year—Required: (a) a special section of the Senior Course, English 151 (3), studying a contemporary author, or possibly more than one author; (b) the Comprehensive Examination (3). The specific upper division requirements total 9 units. The remaining units are to be selected subject to the advice of a departmental adviser.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who do not maintain such an average will be required to withdraw from the major in English.

Attention is called to the requirements in foreign languages for higher degrees in English—a reading knowledge of French or German for the M.A.; of French, German, and Latin for the Ph.D. Undergraduates contemplating advanced study in English should prepare to satisfy these requirements as they proceed to the bachelor's degree.

*Honor Students in the Senior Year*.—See Honors Course, page 159.

*Teacher Training*.—Consult Mr. Evans or Mr. Lynch; see also the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

*Higher Degrees*.—Consult Mr. Schorer; see also the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the Graduate Division bulletin entitled ANNOUNCEMENT IN MODERN LANGUAGES AND LITERATURES.

#### LOWER DIVISION COURSES

##### FRESHMAN COURSE

1A–1B. First-Year Reading and Composition. (3–3) Yr. Beginning each semester.

Mr. Bogard, Mr. Brandt, Mr. Brightfield, Mr. Brooks, Mr. Carter, Mr. Cook, Mr. Dollard, Mr. Edwards, Mr. Frost, Mr. Hart, Mr. Hutson, Mr. Jones, Mr. R. M. Jordan, Mr. Kelling, Mr. Kurth, Mr. Lehman, Mr. Levy, Mr. McKenzie, Miss Miles, Mr. Muscatine, Mr. Parkinson, Mr. Raleigh, Mr. Reed, Mr. Shumaker, Mr. Tuveson, Mr. Watt, Mr. Zumwalt

Prerequisite: a passing grade in Subject A (examination or course).  
*Credit for English 1A or 1B will not be given to any student who has not passed the Subject A examination or course.*

1A. Training in writing and reading.

1B. An introduction to the study of literature, with further training in writing.

Prerequisite for the English major. Course 1A is prerequisite to 1B.

##### SOPHOMORE COURSES

\*25. Language. (3) I.

Mr. Reed

The origins and symbols of human speech; patterns, change, and growth in language; the interrelations of language, thought, and civilization. Emphasis on English, as written and spoken in England and in America. Designed for sophomores, but open to students in the upper division.

30. Introduction to American Literature. (3) II.

Mr. Edwards

40. Intermediate Exposition. (3) II.

Mr. Tuveson

Prerequisite: course 1A–1B or Speech 1A–1B or the equivalent.

Writing in various expository forms.

\* Not to be given, 1954–1955.

41. Writing in Connection with the Reading of Important Books of the Nineteenth and Twentieth Centuries. (3) I. Mr. Parkinson  
Prerequisite: course 1A-1B or Speech 1A-1B, or consent of instructor.
- 44A-44B. Masterpieces of Literature. (3-3) Yr. Mr. Lehman, ——  
44A: Mr. Lehman; 44B: ——  
Lectures on great works of the world's literature.  
Course 44A is not prerequisite to 44B.
- 46A-46B. Survey of English Literature. (3-3) Yr.  
Mr. Bogard, Mr. Caldwell, Mr. Carter, Mr. Cline, Mr. Cook, Mr. Dollard, Mr. Edwards, Mr. Hart, Mr. Jones, Mr. Kelling, Mr. Raleigh, Mr. Reed, Mr. Watt  
Prerequisite: course 1A-1B.  
Close study of typical works of major authors from Chaucer to Hardy, with consideration of the more important aspects of English literary history.
49. Ten Great Books in the British Tradition. (3) II. Mr. Cline

## UPPER DIVISION COURSES

**Group I—Unrestricted Courses**

(Open to all students in the upper division; enrollment not limited, except as noted)

## A. COURSES IN COMPOSITION AND LANGUAGE

110. The English Language. (3) II. Mr. Reed
131. American English. (3) I. Mr. Reed  
General description of the English language in America. Comparisons with British English. American regional dialects.
141. Modes of Writing (Exposition, Fiction, Verse, etc.). (3) II. Mr. Parkinson  
Prerequisite: course 1A-1B or Speech 1A-1B, or consent of instructor.  
Open to qualified sophomores with consent of instructor.  
Writing in connection with readings in recent English literature and its continental backgrounds.

## B. COURSES IN LITERATURE

- 114A-114B. The English Drama. (3-3) Yr. Mr. Bogard  
114A. From the miracle plays to 1642: Mr. Bogard.  
114B. From 1642 to the present: Mr. Bogard.  
Course 114A is not prerequisite to 114B.
116. The English Bible as Literature. (3) II. Mr. Lehman
- 117A-117B. Shakespeare. (3-3) Yr. Mr. Evans, ——  
117A: Mr. Evans; 117B: ——  
Lectures on the entire works of Shakespeare, including nondramatic poems. Open both to students whose major is English and to others. Course 117A is not prerequisite to 117B.
- 117E. Shakespeare. (3) I. Mr. Farnham  
Lectures on selected plays of Shakespeare. May not be taken by students whose major is English.

\* Not to be given, 1954-1955.

- 117J. Shakespeare. (3) II. Mr. Bronson  
 Studies of selected plays, with practice in various critical approaches; e.g., establishing text, relation to source, changing concepts of comedy and tragedy, influence of physical conditions on technique. Limited to twenty-five students.
119. The Age of Johnson. (3) II. Mr. Bronson
120. Backgrounds of English Literature in the Middle Ages. (3) II. Mr. Jones  
 A survey of Western European literary culture from the New Testament to Dante. Lectures and assigned reading in English translations of medieval classics.
121. The Romantic Period. (3) II. Mr. Caldwell
122. The Victorian Period. (3) I. Mr. McKenzie
- \*123. Nineteenth-Century British Prose. (3) I. Mr. Jordan
- 125B. The Novel in Western Civilization. (3) II. Mr. Cook
- 125C-125D. The English Novel. (3-3) Yr. Mr. Brightfield  
 Course 125C is not prerequisite to 125D.
- 125E. The American Novel. (3) I. Mr. Smith
128. Regional Literature: California and the West. (3) I. Mr. Hart
- 130A. American Literature Before 1840. (3) I. Mr. Smith
- 130B. American Literature: 1840-1885. (3) II. Mr. Carter
- 130C. American Literature: 1885 to the Present. (3) II. Mr. Stewart
149. The English Lyric. (3) I. Miss Miles  
 The development of the English traditions of structure and style in lyric poetry.
- \*152. Chaucer. (3) I. Mr. Shumaker
155. The Age of Chaucer. (3) II. Mr. Muscatine
- 158A-158B. The English Renaissance. (3-3) Yr. Mr. Cline, Mr. Farnham  
 158A: Mr. Cline; 158B: Mr. Farnham.  
 This course replaces the former English 156 (The Age of Elizabeth) and 157 (The Age of Milton).  
 158A: Beginnings of the English Renaissance, and literature of the sixteenth century.  
 158B: Literature of the seventeenth century.  
 Course 158A is not prerequisite to 158B.  
 Students who have taken course 156 or 157 may not take the corresponding part of course 158A-158B for credit.
160. British Literature from 1900 to the Present. (3) I. Mr. Schorer
161. Recent British and American Poetry. (3) II. Mr. Parkinson
166. The Age of Swift and Pope. (3) I. Mr. Tuveson

\* Not to be given, 1954-1955.

**Group II—Restricted Courses****A. THE JUNIOR COURSE**

(Sections limited to twenty students each)

Designed primarily for juniors whose major subject is English.

100. Methods and Materials of Literary Criticism. (3) I and II.

Mr. Bogard, Mr. Caldwell, Mr. Carter, Mr. Cook, Mr.  
Dollard, Mr. Edwards, Mr. Hart, Mr. Kelling, Mr.  
Lehman, Mr. McKenzie, Miss MilesExplication and evaluation of literary texts and study of the various  
principles of literary judgment.**B. THE SENIOR COURSE**

(Sections limited to twenty students each)

Designed primarily for seniors whose major subject is English; English 151K  
is prescribed for English majors working under Plan II.

Prerequisite: course 100.

- 151C. Conrad. (3) I. Mr. Watt
- 151E. Henry James. (3) II. Mr. Smith
- 151J. Donne and Milton. (3) I and II. Mr. Barish
- 151K. Contemporary Authors. (3) I and II. Miss Miles, Mr. Schorer  
I: Wallace Stevens, Miss Miles; II: D. H. Lawrence, Mr. Schorer.
- 151L. Chaucer. (3) I and II. Mr. Bronson, Mr. Caldwell, Mr. Cline  
I: Mr. Bronson, Mr. Caldwell; II: Mr. Cline.
- 151S. Shakespeare. (3) II. Mr. Bogard
- \*151Sp. Spenser. (3) II. Mr. Jayne
- \*151Sw. Swift. (3) II. Mr. Watt
- \*151W. Whitman. (3) I. Mr. Carter
- \*151Wd. Wordsworth. (3) II. Mr. Jordan
- 198A–198B. Senior Preceptorial Course. (3–3) Yr. Mr. Kelling, Mr. Raleigh  
198A: Mr. Raleigh; 198B: Mr. Kelling.  
Reading in chosen fields, with critical writing.  
Primarily for English majors in Plan II.  
Course 198A is not prerequisite to 198B, but a student must have re-  
ceived a grade of at least B in the course for one semester in order to be  
admitted to the course for a second semester.

**C. HONORS COURSE**

199. Special Study for Advanced Undergraduates. (1–3) I and II.

The Staff (Mr. Bogard in charge)

Reading and conference for individual honor students.

Any student who completes 9 or more units of upper division English  
in the junior year with an average grade of not less than B may apply for  
admission to course 199. Such honor students undertake, in a chosen field,  
a program of reading and of conferences with the instructor. The subject

\* Not to be given, 1954–1955.

matter should not coincide with that of any regular course and should be specific enough to permit the student to write a significant essay based upon his study. The number of units of credit is determined by the instructor.

#### D. ADVANCED COMPOSITION

(Open only to upper division students who have the consent of the instructor. With the consent of the instructor, courses numbered 106 may be repeated without duplication of credit.)

- 106A. Fiction. (3) I. Mr. Schorer
- 106B. Verse. (3) II. Miss Miles
- 106D. Literary Criticism. (3) II. Mr. Watt
- 106E. Long Narrative. (3) II. Mr. Stewart  
The student will work throughout the semester on a single project, either fiction (novel) or nonfiction (biography, history).
- 106H. Expository and Critical Writing. (3) II. Mr. Muscatine
- 106L. Advanced Composition. (3) I and II. Mr. Evans, Mr. Tuveson  
I: Mr. Tuveson; II: Mr. Evans.  
Primarily for candidates for the Certificates of Completion of the teacher-training curriculum whose teaching major is English.
- 106M. Advanced Composition. (3) I and II. Mr. Barish, Mr. Tuveson  
Specifically for candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is not English.

#### E. COMPREHENSIVE FINAL EXAMINATION

The Comprehensive Final Examination for Plan II of the undergraduate major in English must be taken at the end of the senior year. It will consist of three parts; a three-hour written examination on the history and criticism of literature to 1700; a similar examination on the period from 1700 to the present; and an oral examination of approximately half an hour, mainly factual in content. The student should attend any general conferences held by the board during the semester, and may consult individually with the members of the board. *The student's preparation for the examination presumably extends throughout the entire period of upper division residence.* Upon the student's passing the examination the grade assigned by the department, with the appropriate grade points, will be recorded.

Given at the end of the fall and spring semesters and at the beginning of the fall semester.

Mr. Tuveson (chairman), Mr. Carter, Mr. Raleigh (fall semester),  
Mr. Kelling, Mr. Muscatine (spring semester), Mr. Parkinson

#### TEACHERS' COURSE

300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I and II. Mr. Evans

This course, designed for seniors and graduate students undertaking an English teaching major or minor, should be completed before practice teaching. The course is accepted in partial satisfaction of the 22-unit requirement in education for the general secondary credential.



## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Students who have not passed the department's examination in French or in German will be admitted to a seminar only with consent of the instructor.

French 206A-206B and German 265 are especially recommended to candidates for higher degrees. Attention is directed to German 204.

The following courses are recommended for first-year graduate students: 200, 202, 208, 211A-211B, 213.

The following courses will be given as seminars: 202, 210, 212, 217, 218, 220B, 225A-225B, 228, 230A-230B, 235, 245, 247, 251A-251B, 254A-254B, 257A, 257B, 258, 262, 264, 266, 269.

Attention is directed to the fact that the period courses, 119, 121, 122, 123, 155, 158A-158B, 160, and 166, are particularly adapted to graduate study.

Since the courses listed as seminars are concerned with specific problems in the designated fields, the attention of graduate students desiring general surveys is directed to the following upper division courses: 119, 120, 121, 122, 123, 128, 130A, 130B, 130C, 155, 158A-158B, 160, and 166.

200. Techniques of Literary Scholarship. (3) I and II.

Mr. Brightfield, Mr. Shumaker

I: Mr. Brightfield, Mr. Shumaker; II: Mr. Brightfield.

202. The History of English Criticism. (3) I.

Mr. Brightfield

†204. Celtic Studies. (3) I and II.

Mr. Hutson

This course may be repeated for credit.

208. Problems in the Study of Literature. (3) I and II.

Mr. Lehman, Mr. Stewart

Textual analysis, discussion of scholarly approaches, based on secondary reading; problems in the presentation of materials.

I: Comedy and Satire, Mr. Lehman; II: Seventeenth Century, Miss Miles.

\*210. Chaucer. (3) I.

Mr. Cline

Some knowledge of Chaucer and his language is presupposed.

211A. Old English Literature. (3) I.

Mr. Brodeur, Mr. Hutson

Open to seniors with consent of instructor.

Rapid reading of Old English texts.

211B. The Beowulf. (3) II.

Mr. Brodeur

211G-211H. Old and Middle English. (3-3) Yr.

Mr. Brodeur

Development of the English language from its beginning as illustrated in representative texts. Especially designed for candidates for the Ph.D. degree.

211J. Modern English. (3) I.

Mr. Reed

Continuation of 211G-211H. Development of standard English to the present; the structure of present-day English. Especially designed for candidates for the Ph.D. degree.

\*212. Old English Poetic Forms and Techniques. (3) II.

Mr. Brodeur

Prerequisite: two semesters of Old English.

213. Readings in Middle English. (3) I and II.

Mr. Brodeur, Mr. Hutson

I: Mr. Brodeur; II: Mr. Hutson.

Rapid reading of selections in Middle English, and perhaps some entire poems, from the twelfth century to the fifteenth.

\* Not to be given, 1954-1955.

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

- \*217. Studies in Shakespeare. (3) II. \_\_\_\_\_
218. Milton. (3) II. Mr. Shumaker
- 220A-220B. The Medieval Mind. (3-3) Yr. Mr. Jones  
 220A. Readings in Medieval Latin.  
 Prerequisite: Two years of high school Latin or equivalent.  
 An introduction to the central language and literature of the Middle Ages.
- 220B. Dominant Themes in Medieval Literature.  
 Prerequisite: course 120 or 220A or equivalent.  
 Bibliography and special problems. Accent upon medieval European literature without geographical or linguistic distinctions.
- \*225A-225B. The Popular Ballad. (3-3) Yr. Mr. Bronson
- \*228. Regional Literature: California and the West. (3) II. Mr. Hart
- 230A-230B. American Literature. (3-3) Yr. Mr. Hart
235. Mark Twain. (3) II. Mr. Smith
- \*245. Spenser. (3) II. Mr. Jayne
247. Theory of Poetry. (3) II. Miss Miles
- \*251A-251B. Romantic Poets. (3-3) Yr. Mr. Caldwell  
 Course 251A is not prerequisite to 251B.
- 254A-\*254B. Elizabethan Drama. (3-3) Yr. Mr. Farnham  
 Course 254A is not prerequisite to 254B.
- 257A. Literary Criticism, 1750-1850. (3) I. Mr. McKenzie
- \*257B. Methods and Assumptions of Recent Literary Critics. (3) II.  
 Mr. Shumaker
258. Johnson and His Contemporaries. (3) I. Mr. Bronson
262. Nineteenth-Century Literature. (3) II. Mr. Lehman
- \*264. John Donne and His Followers. (3) I. \_\_\_\_\_
266. Period from 1660 to 1744. (3) II. Mr. Tuveson
269. Theory of Fiction. (3) II. Mr. Schorer
298. Special Study. (1-4) I and II. The Staff (Mr. Schorer in charge)  
 This course is normally reserved for students directly engaged upon the doctoral dissertation.  
 The members of the department are variously engaged in particular research and stand ready to advise and direct properly qualified graduate students in their several fields. Some indication of fields of interests is herewith suggested:
1. Critical Theory (Brightfield, Caldwell, McKenzie, Miles, Schorer, Shumaker).
  2. Prose Fiction (Brightfield, Cook, Lehman, Raleigh, Schorer).
  3. Drama (Barish, Bogard, Evans, Farnham).
  4. Poetry (Caldwell, Miles, Parkinson).
  5. Linguistics (Brodeur, Hutson, Reed).

6. Early Germanic Literature (Brodeur).
  7. Celtic (Hutson).
  8. The Ballad (Bronson).
  9. Chaucer and the Middle Ages (Brodeur, Caldwell, Cline, Jones, Muscatine, Shumaker).
  10. Shakespeare, Donne, Sixteenth and Seventeenth Centuries (Cline, Barish, Farnham, Jayne, Miles, Shumaker).
  11. Eighteenth Century (Bronson, Kelling, Lynch, Schorer, Tuveson, Watt).
  12. Nineteenth Century (Brightfield, Caldwell, Jordan, Lehman, McKenzie).
  13. Twentieth Century (Hart, Lehman, Parkinson, Schorer, Stewart).
  14. American Literature (Carter, Edwards, Hart, Smith, Stewart).
299. Special Study. (1-3) I and II. The Staff (Mr. Schorer in charge)  
This course is primarily for students engaged in preliminary exploration of a restricted field, involving research and the writing of a report. It may not be substituted for available seminars.

## RELATED COURSES

- Romanticism in Western Europe (Comparative Literature 121).  
The Renaissance in the Literatures of Italy, France and England (Comparative Literature 151A-151B).  
The Symbolist Movement in European Literature (Comparative Literature 201A-201B).

**ENTOMOLOGY AND PARASITOLOGY**

(Department Office, 112 Agriculture Hall)

- Roderick Craig, Ph.D., *Professor of Entomology.*  
Julius H. Freitag, Ph.D., *Professor of Entomology*  
William M. Hoskins, Ph.D., *Professor of Entomology.*  
E. Gorton Linsley, Ph.D., *Professor of Entomology (Chairman of the Department).*  
Morris A. Stewart, Ph.D., *Professor of Parasitology.*  
Robert L. Usinger, Ph.D., *Professor of Entomology.*  
Edward O. Essig, M.S., *Professor of Entomology, Emeritus.*  
Deane P. Furman, Ph.D., *Associate Professor of Parasitology.*  
Dilworth D. Jensen, Ph.D., *Associate Professor of Entomology.*  
Abraham E. Michelbacher, Ph.D., *Associate Professor of Entomology.*  
Woodrow W. Middlekauff, Ph.D., *Associate Professor of Entomology.*  
\*A. Earl Pritchard, Ph.D., *Associate Professor of Entomology.*  
Ray F. Smith, Ph.D., *Associate Professor of Entomology.*  
John W. MacSwain, Ph.D., *Assistant Professor of Entomology.*  
Edward S. Sylvester, Ph.D., *Assistant Professor of Entomology.*



- Merlin W. Allen, Ph.D., *Associate Professor of Plant Nematology.*  
Richard M. Bohart, Ph.D., *Associate Professor of Entomology, Davis.*  
Alfred M. Boyce, Ph.D., *Professor of Entomology, Riverside.*  
\*Richard L. Doutt, Ph.D., *Associate Professor of Biological Control.*  
\*Stanley E. Flanders, Ph.D., *Professor of Biological Control, Riverside.*

\* In residence spring semester only, 1954-1955.

Norman W. Frazier, Ph.D., *Lecturer in Entomology.*

Harold T. Gordon, Ph.D., *Lecturer in Entomology and Lecturer in Physiology.*

Harold F. Madsen, Ph.D., *Lecturer in Entomology.*

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

*Letters and Science List.*—Courses 100, 106, 110, 112, 117, 119, 126, 127, 129, 131, 133 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. MacSwain.

*Preparation for the Major.*—See page 86 of the CIRCULAR OF INFORMATION.

#### LOWER DIVISION COURSE

49. Summer Field Course. (No credit) Mr. MacSwain, Mr. Bohart  
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) I. Mr. MacSwain  
Lectures and laboratory.  
An introduction to the classification, life histories, morphology, physiology, and ecology of insects.
106. Introduction to Structure and Function in Insects. (5) II. Mr. Craig  
Lectures and laboratory.  
Prerequisite: course 100 or equivalent.  
Comparative anatomy and physiology of selected insect types; histological techniques; general principles of insect physiology.
110. Insect Physiology. (3) I. Mr. Craig  
Lectures and laboratory.  
Prerequisite: course 106; Chemistry 8, or equivalent.  
Detailed consideration of nutrition, digestion, excretion, circulation, respiration, and the nervous and hormonal systems of insects.
112. Systematic Entomology. (4) I. Mr. Linsley, Mr. Usinger  
Lectures and laboratory.  
Prerequisite: course 100 or consent of instructor.  
The classification of insects, taxonomic categories and procedure; bibliographical methods; nomenclature; museum practices.
114. Forest Entomology. (3) I. Mr. MacSwain  
Lectures and laboratory.  
Prerequisite: not open to entomology majors without special consent of instructor.  
The identification, life histories, ecology and control of insects affecting western forests and forest products.
117. Helminthology. (4) I. Mr. Stewart, Mr. Furman  
Lectures and laboratory.  
Helminthic infections of man and domestic animals. Biology, host-parasite interrelationships, identification, prophylaxis, and therapeutics.
118. Plant Nematology. (4) II. Mr. Allen  
Lectures and laboratory.  
Identification, morphology, biology, and distribution of plant parasitic and associated nematodes. Symptomatology, pathology, and control of nematode infections in cultivated crops. Techniques employed in the manipulation and examination of soil and infected plants.

119. Acarology. (2) I. Mr. Furman  
Lecture and laboratory.  
Prerequisite: course 112 or consent of instructor.  
The taxonomy, biology, and ecology of mites and ticks. Laboratory rearing techniques and slide preparation methods.
124. Economic Entomology. (4) II. Mr. Michelbacher, Mr. Middlekauff  
Lectures and laboratory.  
Life histories, habits, distribution, economics, and control of insects attacking agricultural crops and stored products.
125. Insect Vectors of Plant Diseases. (4) I. Mr. Freitag, Mr. Sylvester, Mr. Jensen, Mr. Frazier  
Lectures and laboratory.  
Prerequisite: Plant Pathology 120 or consent of instructor.  
The role of insects in the transmission and causation of plant diseases. Laboratory studies of disease symptoms, host ranges, methods of transmission and properties of plant viruses.
126. Medical Entomology. (4) II. Mr. Stewart, Mr. Furman  
Lectures and laboratory.  
The role of insects and other arthropods in transmission and causation of diseases of humans and domestic animals.
127. Insect Ecology. (3) II. Mr. Smith  
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) I. Mr. Hoskins, Mr. Gordon  
Lectures and laboratory.  
Prerequisite: Chemistry 8, or consent of instructor.  
Chemical composition and reactions of insecticides and fungicides, and their physiological effects on plant and animal tissues.
- \*129. Biological Control of Insect and Weed Pests. (3) I. Mr. Doust  
Lectures and laboratory.  
Prerequisite: course 100 or consent of instructor.  
Principles and methods of biological control; biology of entomophilous insects; critical discussion of important world projects.
130. Insects in Relation to Deciduous Fruit and Nut Crops. (3) II. Mr. Madsen  
Lectures and laboratory (field trip).  
Prerequisite: course 124.  
An advanced course on the biology, ecology, recognition and control of insects and related pests of major deciduous fruits and nuts in California. Emphasis on application methods and the principles of experimental field entomology.
- \*131. Insect Pathology. (4) II. Mr. Steinhaus  
Lectures and laboratory.  
Prerequisite: course 100, and at least one course in mycology, or bacteriology, or protozoölogy.  
General insect pathology and microbiology, including biological relationships between microorganisms and insects. Detailed study of bacterial, fungous, virus, and protozoan diseases of insects; noninfectious diseases; histopathology. Microbial agents and biological control.

---

\* Not to be given, 1954-1955.

133. **Biology of Aquatic Insects.** (4) II. Mr. Usinger  
Lectures and laboratory.  
General and applied limnology, with special reference to insects. Laboratory exercises on the life histories and identification of aquatic insects. Field trips for the study of stream and lake survey methods.
- \*135. **Insects in Relation to Flowering and Other Ornamental Plants.** (3) I. Mr. Pritchard  
Lectures and laboratory.  
Prerequisite: course 124.  
The study of the importance, recognition, taxonomy, biology, ecology, and control of insects and related pests of flowering and other ornamental plants.
136. **Insects in Relation to Vegetable and Field Crops.** (4) II. Mr. Michelbacher, Mr. Middlekauff  
Lectures and laboratory; one or more field trips.  
Prerequisite: course 124.  
The major insects and related organisms attacking commercial vegetable and field crops in California; their biology, ecology, distribution, diagnosis, and cultural and chemical control.
199. **Special Study for Advanced Undergraduates.** (1-5) I and II. The Staff (Mr. Linsley in charge)

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 200A-200B. **Research in Entomology and Parasitology.** (1-6; 1-6) Yr. The Staff (Mr. Linsley in charge)
- 201A-201B. **Seminar in Economic Entomology.** (1-1) Yr. Mr. Allen, Mr. Smith
- 202A-202B. **Seminar in Parasitology.** (1-1) Yr. Mr. Stewart, Mr. Furman
- 203A-203B. **Seminar in Insect Toxicology and Insect Physiology.** (1-1) Yr. Mr. Craig, Mr. Hoskins, Mr. Gordon
- 204A\*-204B. **Seminar in Insect Pathology.** (1-1) Yr. Mr. Steinhaus
- 205A-205B. **Seminar in Systematic Entomology.** (1-1) Yr. Mr. Linsley, Mr. MacSwain, Mr. Usinger
- 206A-206B. **Staff Seminar in Entomology.** (No credit) Yr. The Staff (Mr. Linsley in charge)
210. **Insect Biochemistry.** (3) I. Mr. Craig, Mr. Gordon, Mr. Hoskins  
Lectures and laboratory.  
Prerequisite: courses 110 and 128. Recommended: courses 106, 112, 127; Biochemistry 103.  
Interpretation of ecological specializations, including parasitism and host specificity, on the basis of nutrition and enzyme mechanisms. In alternate years emphasis is placed on the action of toxic chemicals, resistance to insecticides, bioassay methods, and interpretation of experimental results.
212. **Principles of Systematic Entomology.** (3) II. Mr. Linsley, Mr. Usinger  
Prerequisite: course 112, or consent of instructor.  
The theory and philosophy of systematic entomology with emphasis on phylogeny, zoogeography, and nomenclature.

\* Not to be given, 1954-1955.

226. Advanced Medical Entomology. (2) I. Mr. Stewart, Mr. Furman  
Prerequisite: courses 117, 126; Bacteriology 101. Recommended:  
courses 106, 112, 127.  
The genesis of arthropod-borne diseases.
232. History of Entomology. (3) II. Mr. Jensen  
Prerequisite: course 100 and one additional course in entomology.  
Outline of the development of world entomology.

## (GIVEN AT RIVERSIDE)

## GRADUATE COURSES

- 200A-200B. Seminar in Entomology, Including Biological Control. (1-1) Yr.  
The Staff (Entomology, Mr. Boyce in charge;  
Biological Control, Mr. Flanders in charge)
- 201A-201B. Research in Entomology. (2-6; 2-6) Yr. Mr. Boyce
- 205A\*-205B. Research in Biological Control. (2-6; 2-6) Yr. Mr. Flanders

**FOOD TECHNOLOGY**

(Department Office, 313 Hilgard Hall)

Maynard A. Joslyn, Ph.D., *Professor of Food Technology.*Gordon Mackinney, Ph.D., *Professor of Food Technology (Vice-Chairman of the Department).*Emil M. Mrak, Ph.D., *Professor of Food Technology (Chairman of the Department), Davis.*William V. Cruess, Ph.D., *Professor of Food Technology, Emeritus.**Departmental Major Adviser: Mr. Mackinney.**Preparation for the Major.—See page 86 of the CIRCULAR OF INFORMATION.*

## UPPER DIVISION COURSES

112. Principles and Practices of Food Processing. (3) II. Mr. Joslyn  
Prerequisite: 13 units of chemistry and 4 units of bacteriology; food  
technology majors are required to have Bacteriology 1, 5 units.  
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) I.  
Mr. Mackinney  
Prerequisite: 13 units of chemistry, including organic, and 4 units of  
bacteriology; food technology majors are required to have Bacteriology  
1, 5 units.  
Relation of food processing and handling to acceptability, color  
changes, enzyme activity, deterioration, flavor, vitamin retention, and  
other factors.
118. Enzyme Technology. (3) II. Mr. Joslyn  
Prerequisite: Biochemistry 102. Recommended: Bacteriology 103.  
Control and utilization of enzymes in preparation and preservation of  
foods and food products.

\* Not to be given, 1954-1955.

120. The Natural Coloring Matters. (3) I. Mr. Mackinney  
Lectures and laboratory.  
Prerequisite: three units of biochemistry or plant biochemistry, or upper division organic chemistry.  
Chemistry of natural pigments and related compounds; spectrophotometric and chromatographic techniques; special emphasis on pigments in relation to foods.
- \*127. Recent Advances in Food Technology. (1) II. \_\_\_\_\_  
May be repeated once for credit.  
Prerequisite: two courses in food technology or equivalent.  
Assigned topics, reports, and discussions concerning recent advances in food technology.
140. Unit Operations in Food Industries. (2) II. Mr. Joslyn  
Prerequisite: Chemistry 8, 109, Bacteriology 1, or their equivalent.  
Introduction to selection and operation of processing methods and machinery, and economics of plant location, with particular emphasis on the more important unit operations of food engineering.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Mackinney in charge)

## GRADUATE COURSES

- 200A-200B. Seminar in Food Technology. (1-1) Yr.  
The Staff (Mr. Mackinney and Mr. Joslyn in charge)
- 237A-237B. Research in Food Technology. (1-9; 1-9) Yr.  
The Staff (Mr. Joslyn in charge)

## FOREIGN LITERATURE IN TRANSLATION

The following courses offered in the departments of language and literature do not require a reading knowledge of any foreign language.

- Classics 34. Epic Poetry: Homer and Vergil.  
35. Greek Tragedy.  
\*37A-37B. Survey of Greek Literature.  
\*135. Greek and Roman Comedy.  
178. Greek and Roman Mythology.  
\*180A-180B. The Latin Classics in English.
- French 39A-39B-39C. French Literature in English Translation.  
\*122A-122B. French Literature of the Middle Ages.  
\*123A-123B. Renaissance and Reformation in French Literature.  
\*124A-124B. Voltaire and the Enlightenment.  
126A-126B. Readings in Contemporary French Literature.
- German 39A-39B-39C-39D. Great Writers in German Literature.  
\*Italian 150A-150B. Dante's *Divine Comedy* in English Translation.  
Near Eastern Languages 110A-110B. Great Books of Near Eastern Literature.
- Oriental Languages 38A-38B. Great Books of Eastern Asia.  
112A-112B. Survey of Chinese Literature and Literary Criticism.  
\*132. History of Japanese Literature.
- Scandinavian 100A-100B. History of Scandinavian Literature.  
\*106. History of Scandinavian Drama up to 1900.  
\*107. The Plays of Ibsen.

\* Not to be given, 1954-1955.



108. Strindberg and His Writings.  
 \*109. Scandinavian Drama of the Twentieth Century.  
 120A-120B. The Novel in Scandinavia.  
 125. Masterpieces of Old Norse Literature.  
 Slavic Languages and Literature 30. Great Writers of Russian Literature.  
 \*130. Introduction to Russian Literature.  
 131. Russian Literature (1880-1917).  
 132. Russian Literature Since 1917.  
 133A. Russian Novelists of the Nineteenth Century and Western European Literatures.  
 133C. Dostoevski.  
 \*133D. Tolstoy.  
 \*133F. Chekhov.  
 134. Russian Folklore.  
 \*135. The Russian Drama.  
 140. Survey of Slavic Literatures.  
 151. Polish Literature: Sixteenth to Eighteenth Centuries.  
 153. Polish Literature of the Post-Romantic Period.  
 \*154. Polish and Russian Romanticism.  
 \*160. Survey of Czech and Slovak Literature.  
 \*161. Czech and Slovak Literature of the Nineteenth Century.  
 \*170. Survey of South Slavic Literatures.  
 180A-180B. Survey of Russian Culture.  
 \*182. History of Polish Culture.  
 Spanish 39A-39B-39C-39D. Spanish and Spanish-American Literature in English Translation.

## FORESTRY

(Department Office, 243 Forestry Building)

- Frederick S. Baker, F.E., *Professor of Forestry (Chairman of the Department)*.  
 Percy M. Barr, Ph.D., Sc.D., *Professor of Forestry*.  
 Harold H. Biswell, Ph.D., *Professor of Forestry*.  
 Robert A. Cockrell, Ph.D., *Professor of Forestry*.  
 Myron E. Krueger, M.S., Sc.D., *Professor of Forestry*.  
 Henry J. Vaux, Ph.D., *Professor of Forestry*.  
 Emanuel Fritz, M.E., M.F., *Professor of Forestry, Emeritus*.  
 Joseph Kittredge, Ph.D., *Professor of Forestry, Emeritus*.  
 Walter Mulford, F.E., Sc.D., *Professor of Forestry, Emeritus*.  
 Arthur W. Sampson, Ph.D., *Professor of Forestry, Emeritus*.  
 Robert N. Colwell, Ph.D., *Associate Professor of Forestry*.  
 R. Keith Arnold, Ph.D., *Assistant Professor of Forestry*.  
 Harold F. Heady, Ph.D., *Assistant Professor of Forestry*.  
 Edward C. Stone, Ph.D., *Assistant Professor of Forestry*.  
 †John A. Zivnuska, Ph.D., *Assistant Professor of Forestry*.



Arthur B. Anderson, Ph.D., *Lecturer in Forestry*.

*Letters and Science List*.—Courses 1, 103, 122, and 125 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

\* Not to be given, 1954-1955.

† Absent on leave, 1954-1955.

## LOWER DIVISION COURSES

1. Elements of Forestry. (3) I. Mr. Cockrell  
 Not open to students with a major in forestry.  
 Forests in their relation to national life; the life history of the tree and the forest; general principles of forestry.
49. Forestry Field Practice Course. (No credit) Mr. Arnold  
 (Formerly numbered 49F.)  
 Prerequisite: Engineering 1A, Botany 1, and an average grade of C or higher. Course is prerequisite to all required courses in the School of Forestry.  
 Approximately eleven weeks of field laboratory work in forest surveys and mapping, forest mensuration, silviculture, logging, and milling operations at Meadow Valley near Quincy in the Plumas National Forest.

## UPPER DIVISION COURSES

Course 49 is prerequisite to all required courses in the School of Forestry.

100. Introduction to Professional Forestry. (3) I. Mr. Baker  
 Open only to students whose major is forestry.  
 The branches of forestry, their significance and relationships; values derived from forests; forest policy.
103. Principles of Forest Ecology. (3) I. Mr. Stone  
 Prerequisite: Botany 1, Chemistry 1A.  
 Structure of the plant as modified by conditions of habitat; plant succession and societies.
104. Silviculture. (4) I. Mr. Baker  
 Lectures and laboratory.  
 Prerequisite: course 103.  
 Methods of governing growth and reproduction of forests through the application of ecological laws.
106. Forest Planting. (3) II. Mr. Colwell  
 Lectures, laboratory, and field trips.  
 Prerequisite: Botany 1.  
 Artificial establishment of forests from collection of seed to planting of trees; the physiological, environmental, and genetic factors affecting survival and growth of forest seedlings; financial aspects of forest plantations.
108. Dendrology. (4) I. Mr. Stone  
 Lectures, laboratory, and field trips.  
 Prerequisite: Botany 1.  
 Identification by morphological characters of important forest trees of North America; their ecological and geographical distribution; field identification of many forest shrubs.
110. Forest Mensuration. (4) II. Mr. Arnold  
 Lectures and laboratory.  
 Prerequisite: a course in elementary statistics; course 49.  
 Principles underlying log scaling and the estimation of timber volume and value; growth of stands; the application of statistical analysis to forest measurements.

112. Lumber Manufacturing. (3) I. \_\_\_\_\_  
 Prerequisite: senior standing. Senior and graduate students from other departments may be admitted with consent of instructor.  
 Organization and characteristics of the lumber industry; the manufacture of lumber from log pond to finished product; seasoning, grading, marketing.
114. Wood Technology. (3) II. Mr. Cockrell  
 Lectures and laboratory.  
 Prerequisite: Chemistry 1A, Botany 1.  
 Junior and senior students from other departments may be admitted with consent of instructor.  
 Anatomy of wood; properties and uses; identification of commercial species.
115. Physical Properties of Wood. (3) I. Mr. Cockrell  
 Lectures and laboratory.  
 Prerequisite: Physics 2A-2B, 3A-3B, or equivalent.  
 Density, moisture relations, shrinking and swelling, strength, thermal, electrical, and acoustic properties of wood.
118. Forest Engineering. (3) II. Mr. Krueger  
 Lectures and laboratory.  
 Prerequisite: Engineering 1A-1B, Physics 2A-2B.  
 Engineering methods involved in logging and forest management.
120. Management of Forest Properties. (4) II. Mr. Barr  
 Lectures and laboratory.  
 Prerequisite: courses 104 and 110.  
 Economic and technical principles involved in the management of forest lands for the continuous production of timber crops.
- 121A-\*121B. Forest Economics. (3-3) Yr. Mr. Vaux  
 Prerequisite: 6 units of economics and senior standing. Upper division and graduate students from other departments may be admitted with consent of instructor.  
 Course 121A not prerequisite to 121B.  
 121A. (Formerly numbered 121.) Economics of forest land and timber.  
 121B. Economics of utilization and distribution of forest products.
122. Forest Policy. (3) I. Mr. Vaux  
 Prerequisite: 6 units of economics and senior standing.  
 The evolution of forest policy in the United States. State and national forest policies. Policy objectives, programs, and groups. Analysis of current policy problems.
125. Forest Influences. (3) I. \_\_\_\_\_  
 Lectures and laboratory or field trips.  
 Prerequisite: course 103, Physics 2A-2B, senior standing. Recommended: Soil Science 100 and Geography 111.  
 The influence of forests and brush on soil moisture, run-off, stream flow, floods, erosion, local climate, and soil productivity for forest growth.
126. Production Methods in the Forest Industries. (3) II. Mr. Krueger  
 Prerequisite: 6 units of economics and senior standing.  
 Production methods and principles involved in logging; cost analyses.

\* Not to be given, 1954-1955.

128. Forest Protection. (3) II. Mr. Arnold  
Lectures; one field trip.  
Junior and senior students from other departments may be admitted with consent of instructor.  
Forest fire behavior; ignition and spread of forest fires and factors by which they are influenced; forest fire control organization and equipment; methods of fire prevention and suppression.
130. Industrial Forestry. (3) II. Mr. Barr  
Prerequisite: senior standing. Senior and graduate students from other departments may be admitted with consent of instructor.  
The application of forest management to large properties under private ownership; nature and development of the industrial forest enterprise; costs and returns; integration of forest industries; status and trends of American industrial forestry.
132. Forest Photogrammetry. (3) II. Mr. Colwell  
Lectures and laboratory.  
The construction of planimetric and topographic maps from vertical and oblique aerial photographs. The use of aerial photographs in mapping vegetation types and estimating timber volumes. Construction of aerial photo mosaics.
198. Directed Group Study. (1-5) I and II.  
The Staff (Mr. Baker in charge)  
Prerequisite: senior standing and consent of instructor.  
Group study, or investigation, of special problems.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Baker in charge)  
Prerequisite: senior standing and consent of instructor.  
This course may also be taken during the summer at the Forestry Camp at Meadow Valley, Plumas County.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 201A-201B. Seminar in Forestry. (2-2) Yr. ———, Mr. Krueger  
Course 201A is not prerequisite to 201B.
- 202A-202B. Research in Forestry. (1-6; 1-6) Yr.  
The Staff (Mr. Baker in charge)  
Course 202A is not prerequisite to 202B.
- 203A-203B. Seminar in Forest Influences and in Forest Ecology. (2-2) Yr.  
—————, Mr. Stone  
Prerequisite: plant physiology (3 units); course 125 for course 203A; course 103 and Chemistry 8 for course 203B.  
Course 203A is not prerequisite to 203B.
204. Seminar in Silviculture. (2) I. Mr. Stone  
Prerequisite: course 104.
205. Seminar in Wood Technology. (2) I. Mr. Cockrell  
Prerequisite: course 114.
206. Seminar in Forest Management. (2) II. Mr. Barr  
Prerequisite: course 120, 6 units of economics.

- 207A-207B. Seminar in Forest Economics. (2-2) Yr. Mr. Vaux, ——  
 Prerequisite: 12 units of economics, agricultural economics, or forest economics.  
 Course 207A is not prerequisite to 207B.

## FRENCH

(Department Office, 4125 Dwinelle Hall)

- Clarence D. Brenner, Ph.D., *Professor of French (Chairman of the Department)*.  
 Francis J. Carmody, Ph.D., *Professor of French*.  
 Jacqueline de La Harpe, Docteur ès Lettres (Lausanne), *Professor of French*.  
 Percival B. Fay, Ph.D., *Professor of French*.  
 Arnold H. Rowbotham, Ph.D., *Professor of French*.  
 Ronald N. Walpole, Ph.D., *Professor of French*.  
 Mathurin Dondo, Ph.D., *Associate Professor of French, Emeritus*.  
 Clifford H. Bissell, Ph.D., *Associate Professor of French, Emeritus*.  
 Alvin A. Eustis, Jr., Ph.D., *Associate Professor of French*.  
 Edward F. Meylan, Ph.D., *Associate Professor of French*.  
 Warren Ramsey, Ph.D., *Associate Professor of French and Comparative Literature*.  
 Irving Putter, Ph.D., *Assistant Professor of French*.  
 Frank Bowman, M.A., *Acting Instructor in French*.  
 Basil Guy, M.A., *Acting Instructor in French*.  
 J. Robert Loy, Ph.D., *Instructor in French*.  
 Marie-Louise Dufrenoy, Ph.D., *Associate in French*.

*Letters and Science List.*—All undergraduate courses except 20 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Meylan, Mr. Walpole.

*Preparation for the Major.* Required: courses 1, 2, 3, 4, 25, or their equivalents. (Students who receive grade A or B in French 4 will be admitted to the upper division courses without the requirement of course 25.) History 4A-4B, Philosophy 20A-20B, English 1A-1B, and Latin are strongly recommended.

*The Major.*—Required: courses 101A-101B, 109A-109B, and either 112A-112B, 120A-120B, or 121A-121B.

Any of the remaining upper division courses may be counted for the major with the exception of 108A-108B, 122A-122B, 123A-123B, 124A-124B, and 126A-126B; 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, Italian, Philosophy, or Spanish. Students who fail to maintain an average of one grade point or better for each unit of work undertaken in the upper division courses in the Department of French will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major in French.

*Honors.*—To be recommended for honors at graduation, students must have completed with distinction the courses included in the major.

### LOWER DIVISION COURSES

In courses 2, 3, and 4, three hours of basic study will be supplemented by two hours of specialized practical work, devoted to reading in some sections, and

to conversation in other sections. The work in course 12 will be divided similarly.

1. Elementary French, Beginners' Course. (4) I and II.  
Sections meet five hours per week. Mr. Ramsey in charge
12. Elementary French, Intensive Course. (8) I and II.  
Mr. Ramsey in charge  
Sections meet for two hours, five days per week.
2. Elementary French (continuation of 1). (4) I and II. Mr. Loy in charge  
Sections meet five hours per week.  
Prerequisite: two years of high school French or course 1.
3. Intermediate French. (4) I and II. Mr. Eustis in charge  
Sections meet five hours per week.  
Prerequisite: three years of high school French or course 2 or course 12.  
Students who have hitherto specialized in reading will ordinarily be allowed to transfer to conversation sections of course 3 only if they have received a grade of A or B in course 2 or course 12.
4. Intermediate French, Composition and Conversation. (4) I and II.  
Sections meet five hours per week. Miss Dufrenoy in charge  
Prerequisite: four years of high school French or course 3 (conversation).
- 4R. Intermediate French, Reading. (4) I and II. Mr. Putter in charge  
Reading and translation.  
Prerequisite: course 3 (reading) or four years of high school French.  
Not recommended for students who wish to take course 25 or upper division work.
20. French Pronunciation. (1) I and II. Miss Dufrenoy in charge  
Prerequisite: course 2 or equivalent.  
A course in the pronunciation of French for students on the intermediate level.
25. Advanced French. (3) I and II. Mr. Eustis  
Prerequisite: course 4, or course 4R with grade A or B.
- 1G. French for Graduate Students. (No credit) I and II.  
Mr. Putter in charge  
Preparation for the graduate reading examinations.

#### UPPER DIVISION COURSES

The prerequisite to all upper division courses is 16 units of lower division courses, including course 4 with grade A or B, or course 25.

Courses 101A-101B and 109A-109B must usually be taken before any other upper division course, with the exception of courses 108 and 125.

- 101A-101B. Intensive Reading, Grammar, and Composition. (3-3) Yr.  
Beginning each semester. Mr. Brenner in charge
- 108A-108B. Readings in French Literature. (3-3) Yr. Mr. Meylan  
Prerequisite: course 4 or 4R, or equivalent.  
The masterpieces of French literature read in French, with classroom work in English. Does not satisfy any requirement for the major in French.

- 109A-109B. A Survey of French Literature from the Middle Ages to the Present. (3-3) Yr. Mr. Putter in charge
- 112A-112B. The Nineteenth Century. (2-2) Yr. Miss de La Harpe
- 114A-114B. Contemporary French Literature. (2-2) Yr. Mr. Ramsey
- \*115A-115B. Modern French Drama. (2-2) Yr. Mr. Brenner  
115A. Nineteenth Century; 115B. Twentieth Century.
- 116A-116B. French Literature from 1885 to 1914. (2-2) Yr. Mr. Carmody
- 120A-120B. The Seventeenth Century. (2-2) Yr. Mr. Fay
- 121A-121B. The Eighteenth Century. (2-2) Yr. Mr. Rowbotham
125. Advanced French Pronunciation. (1) I and II. Miss Dufrenoy  
Course 125 is required of all candidates for the Certificate of Completion in French. Normally to be taken in the junior year.
- 130A-130B. Advanced Grammar and Composition. (3-3) Yr. Mr. Meylan  
Prerequisite: course 101A-101B.  
Required of all candidates for the Certificate of Completion of the teacher-training curriculum.
- 131A-131B. Advanced Literary Composition. (3-3) Yr. Miss de La Harpe  
Prerequisite: course 101A-101B.  
Required for all candidates for the M.A. degree.  
A course in the development of an ability to write good literary French.
- 134A-134B. Survey of French Culture and Institutions. (2-2) Yr. Mr. Meylan  
Required of all candidates for the Certificate of Completion in French.
- \*160. Contemporary Literature. (2) II. \_\_\_\_\_  
Prerequisite: course 101A-101B and 109A-109B.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
The Staff (Mr. Eustis in charge)

COURSES IN WHICH NO KNOWLEDGE OF FRENCH IS REQUIRED

39. French Literature in English Translation.  
Lectures (in English) and collateral reading of representative works in English translation.
- 39A. To the End of the Eighteenth Century. (2) I.  
Mr. Putter (in charge), Mr. Eustis, Mr. Carmody, Mr. Loy,  
Mr. Ramsey, Mr. Rowbotham
- 39B. The Nineteenth Century. (2) II.  
Mr. Loy, Mr. Meylan, Mr. Putter, Mr. Rowbotham,  
Mr. Eustis, Mr. Ramsey
- 39C. The Contemporary Period. (2) I. Mr. Loy  
Prerequisite: course 39B or consent of instructor.
- \*122A-122B. French Literature of the Middle Ages. (2-2) Yr.  
122A. Epic, romance, history. Mr. Walpole  
122B. Drama, lyric and allegorical poetry.

- \*123A-123B. Renaissance and Reformation in French Literature. (2-2) Yr.  
Mr. Meylan
- \*124A-124B. Voltaire and the Enlightenment. (2-2) Yr. Mr. Rowbotham  
Prerequisite: upper division standing.  
A study of the period of Enlightenment (seventeenth and eighteenth centuries) using the work of Voltaire as a central point, with excursions into the work of other writers in France and abroad.

- 126A-126B. Readings in Contemporary French Literature. (2-2) Yr.  
Mr. Carmody  
Prerequisite: junior or senior standing and other specially qualified students.  
The masterpieces of French literature of today read in English translation.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Course 201A or 206A is required of all candidates for the M.A. degree.

- 201A-201B. Historical Grammar. (3-3) Yr. Mr. Walpole
- 202A-202B. Studies in Medieval French Literature. (2-2) Yr.  
Reading knowledge of Old French required. Mr. Walpole
- 204A-204B. Studies in the French Eighteenth Century. (2-2) Yr.  
204A. Voltaire and the Philosophers. Mr. Rowbotham  
204B. Jean-Jacques Rousseau.  
Courses 204A-204B, 207A-207B, 210A-210B will be offered in rotation, one each year.
- 206A-206B. Reading and Interpretation of Typical Old French Texts.  
(2-2) Yr. Mr. Fay
- \*207A-207B. Studies in the Eighteenth-Century Novel. (2-2) Yr.  
Mr. Rowbotham
- \*210A-210B. Studies in the Eighteenth-Century Drama. (2-2) Yr.  
Mr. Brenner
- \*214A-214B. French Versification. (2-2) Yr. Mr. Ramsey
- 215A-\*215B. Seminar in Contemporary Literature. (2-2) Yr. Mr. Ramsey
217. Studies in the French Renaissance. (2) I. Mr. Meylan
- \*218A-218B. French Classicism. (2-2) Yr. \_\_\_\_\_
- \*219A-219B. Aspects of French Romanticism. (2-2) Yr. Mr. Rowbotham
- 220A-220B. Explication de Textes. (2-2) Yr. Miss de La Harpe
230. French Literary Criticism. (2) II. Mr. Eustis
235. Methods of Literary Research with Special Reference to Bibliography.  
(1) II. Mr. Brenner  
For prospective doctoral candidates.
298. Special Study for Graduate Students. (1-4) I and II.  
The Staff (Mr. Rowbotham in charge)

\* Not to be given, 1954-1955.



## RELATED COURSES

- Romanticism in Western Europe (Comparative Literature 121).  
 The Renaissance in the Literatures of Italy, France and England (Comparative Literature 151A-151B).  
 The Symbolist Movement in European Literature (Comparative Literature 201A-201B).

**GENETICS**

(Department Office, 348 Hilgard Hall)

- Roy E. Clausen, Ph.D., *Professor of Genetics (Chairman of the Department)*.  
 G. Ledyard Stebbins, Jr., Ph.D., *Professor of Genetics, Davis (Vice-Chairman of the Department)*.  
 Ernest Babcock, M.S., LL.D., *Professor of Genetics, Emeritus*.  
 Spencer W. Brown, Ph.D., *Associate Professor of Genetics and Lecturer in Physiology*.  
 Everett R. Dempster, Ph.D., *Associate Professor of Genetics*.  
 James A. Jenkins, Ph.D., *Associate Professor of Genetics*.



- I. Michael Lerner, Ph.D., *Professor of Poultry Husbandry*.  
 Curt Stern, Ph.D., *Professor of Zoölogy*.  
 Donald R. Cameron, Ph.D., *Lecturer in Genetics*.

*Letters and Science List.*—All undergraduate courses in genetics are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Brown.

*The Major.*—Course work leading to the degree of Bachelor of Science may be undertaken subject to the requirements of the College of Agriculture (see page 80 of the CIRCULAR OF INFORMATION). Students may elect to follow either the animal science curriculum (see page 81 of the CIRCULAR OF INFORMATION) or the plant science curriculum (see page 85 of the CIRCULAR OF INFORMATION).

## UPPER DIVISION COURSES

100. Principles of Genetics. (4) I. Mr. Dempster  
 Lectures and laboratory.  
 Prerequisite: general botany or general zoölogy.  
 Introduction to genetics with some consideration of its applications in agriculture, biology, and human welfare.  
 Credit in this course is limited to one unit for students who are taking or who have received credit for Zoölogy 114.
101. Cytogenetics. (3) II. Mr. Clausen  
 Prerequisite: course 100 and general cytology.  
 Genetics as related to cytological conditions, with particular reference to plant materials. Course 101C may be taken concurrently.
- 101C. Cytogenetics Laboratory. (2) II. Mr. Brown, Mr. Cameron  
 Prerequisite: course 101 (may be taken concurrently).  
 Laboratory study of chromosome morphology and behavior as related to problems in genetics.

102. Biometrical Genetics. (4) I. Mr. Jenkins  
Lectures and laboratory.  
Prerequisite: course 100, or equivalent.  
Genetics with special reference to the application of statistical methods.
- 103A\*-103B. Organic Evolution. (2-2) Yr. Mr. Stebbins  
(Formerly numbered 103.)  
Prerequisite: elementary genetics, elementary botany or zoölogy, and taxonomy or cytology. Genetics 103A is not prerequisite to 103B.  
Organic evolution from the dynamic point of view. Lectures, student reports, discussion.
104. Physiological Genetics. (3) I. Mr. Brown  
Prerequisite: course 100, Chemistry 8, or their equivalent. Recommended: general cytology.  
An introduction to biochemical and physiological genetics.
- \*105. Population Genetics. (3) II. Mr. Lerner, Mr. Dempster  
Prerequisite: course 102.  
A study of the genetic forces operating in artificial selection. Discussion and formulation of breeding plans on the basis of the principles of population genetics with special reference to animals.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Clausen in charge)

## GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 10)
200. Research in Genetics. (1-6) I and II.  
The Staff (Mr. Clausen in charge)
201. Staff Seminar in Genetics. (No credit) I and II.  
The Staff (Mr. Clausen in charge)  
Weekly meeting for the presentation of special topics by members of the staff, visiting investigators, and graduate students.
202. Graduate Seminar in Genetics. (1-4) I and II.  
The Staff (Mr. Clausen in charge)  
Intensive study of special topics in genetics, under supervision of members of the staff.

## RELATED COURSES IN OTHER DEPARTMENTS

- Genetics (Zoölogy 114).  
Genetics Laboratory (Zoölogy 114C).  
Human Genetics (Zoölogy 115).  
Genetics Review (Zoölogy 244).  
Seminar in Advanced Genetics (Zoölogy 245).

**GEOGRAPHY**

(Department Office, 230 Giannini Hall)

John B. Leighly, Ph.D., *Professor of Geography (Chairman of the Department)*.

Carl O. Sauer, Ph.D., *Professor of Geography*.

John E. Kesseli, Ph.D., *Associate Professor of Geography*.

\* Not to be given, 1954-1955.

James J. Parsons, Ph.D., *Associate Professor of Geography.*  
 Clarence J. Glacken, Ph.D., *Assistant Professor of Geography.*  
 Erhard Rostlund, Ph.D., *Assistant Professor of Geography.*



Edwin M. Loeb, Ph.D., *Lecturer in Geography for the fall semester.*  
 Nicholas T. Mirov, Ph.D., *Lecturer in Geography.*

*Letters and Science List.*—All undergraduate courses in geography are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Rostlund.

*Preparation for the Major.*—Required: Geography 1, 2, 4, and mathematics C or equivalent. Recommended: Botany 12, Geography 5A–5B, Geology 10, Paleontology 1, Soils 10, and a course in elementary statistics (Economics 2 or equivalent).

*The Major.*—24 units of upper division work in geography, or from 18 to 21 units of upper division work in geography and from 3 to 6 units chosen under an approved plan from the following: Anthropology 101A–101B; Botany 151; Economics 110, 113; Forestry 103, 125; History 161A–161B, 181A–181B, 190A–190B; Sociology and Social Institutions 133, 145, 167; Soils 101, 101F, 105; Zoölogy 114, 125.

Each program should normally include Geography 101 or 102, 105A, 121A or 121B, 151, and 153.

#### LOWER DIVISION COURSES

1. Introduction to Geography: Physical Elements. (3) I and II.  
 Two lectures and two section meetings per week. Mr. Rostlund
2. Introduction to Geography: Natural and Cultural Regions. (3) II.  
 Two lectures and two section meetings per week. Mr. Rostlund
4. Map Reading and Map Interpretation. (3) I. Mr. Kesseli  
 One lecture and two two-hour laboratory periods per week.
- 5A–5B. Economics Geography. (3–3) Yr. Mr. Glacken  
 Two lectures and two section meetings per week.  
 The distribution of the world's resources and industries.  
 5A. Agricultural production in its regional differentiation.  
 5B. Mineral resources, manufacturing regions, trade routes, and trade centers.  
 Either half of the course may be taken independently.

#### UPPER DIVISION COURSES

101. Field Geography. (3) I. Mr. Kesseli  
 Field trips Saturdays.  
 Field study of a unit area with systematic mapping of the elements that constitute the natural region and of the forms of its utilization. Admission only after consultation with instructor.
102. Field Geography. (3) II. Mr. Parsons  
 Field trips Saturdays.  
 Study of type areas of physical and cultural interest. Admission only after consultation with instructor.
- 105A–105B. Cartography. (3–3) Yr. Mr. Leighly  
 One lecture hour and two three-hour laboratory periods per week.  
 105A: Map Projections. 105B: Map Content.  
 Prerequisite: consent of instructor.

108. Analysis of Land Forms. (3) I. Mr. Kesseli  
Origin of land forms. Review of the varied interpretation of processes involved, with emphasis on recent views.
109. Topographical Photo Interpretation. (3) II. Mr. Kesseli  
One lecture hour and two two-hour laboratory periods per week.  
The identification and classification of data on air photographs; the solution of selected problems in photogrammetry. Admission only after consultation with instructor.
111. Elementary Meteorology. (3) I. Mr. Leighly  
Prerequisite: a knowledge of elementary physics and calculus is desirable.
113. Climatology. (3) II. Mr. Leighly  
Prerequisite: course 111 or consent of instructor.
- 121A. Geography of Eastern North America. (3) I. Mr. Rostlund
- 121B. Geography of Western North America. (3) II. Mr. Rostlund
- 122A. Geography of Middle America. (3) I. Mr. Sauer
- 122B. Geography of South America. (3) II. Mr. Parsons
- 123A. Geography of Mediterranean Europe. (3) II. Mr. Glacken
- 123B. Geography of Northern Europe. (3) I. Mr. Glacken
- 124A. Geography of the Soviet Union. (3) I. Mr. Mirov
- \*124B. Economic Geography of the Soviet Union. (2) II. Mr. Mirov
- 125A. Geography of Southeast Asia. (3) I. Mr. Parsons
- 125B. Geography of China, Japan and Korea. (3) II. Mr. Glacken
127. Geography of Southern Africa. (3) I. Mr. Loeb
130. Geography of the Tropics. (2) I. Mr. Parsons  
An analysis of the resources of the warm and wet lands of the equatorial regions; the economic potentialities of the tropics and the obstacles to their exploitation inherent in the physical and cultural environment.
131. Geography of California. (3) II. Mr. Kesseli
141. Economic Geography: Primary Production. (3) I. Mr. Parsons  
Analysis of the distribution of agricultural and mineral raw materials in relation to world commerce.
142. Economic Geography: Industrial Localization. (3) II. Mr. Parsons  
Factors and trends in the geographic distribution of manufacturing industries.
151. American Geographic Thought. (2) I. Mr. Leighly  
Prerequisite: three upper division courses in geography.  
Reports and conferences on the objectives, subdivisions, and methods of geography by American geographers of the late 19th and the 20th century.

\* Not to be given, 1954-1955.

153. Natural Resources and Their Exploitation. (3) II. Mr. Sauer  
 Conservative and destructive uses of habitat (occupied area) by cultures (economic systems) throughout human time, with emphasis on contemporary problems.
161. Geography of Domesticated Plants and Animals. (3) I. Mr. Sauer  
 A consideration of the processes, times, and places of appropriation of elements of flora and fauna into agricultural economics and of the successive geographic dispersal of the domesticated forms.
176. The Relations Between Nature and Culture. (2) I. Mr. Glacken  
 A critical survey, from antiquity to the present, of leading theories of the effects of the physical environment on culture; the influence of these theories on such fields as geography, history and anthropology; contemporary views of the nature of the physical environment in its relation to population and economic potentials.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
 The Staff (Mr. Rostlund in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

For facilities for research see the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

201. Seminar in Latin-American Geography. (2) I. Mr. Sauer
202. Seminar in Historical Geography. (2) I. Mr. Rostlund
203. Seminar in Cultural Geography. (2) II. Mr. Sauer
- \*205. Seminar in Physical Geography. (2) I. \_\_\_\_\_
- \*206. Seminar in Physical Geography. (2) II. \_\_\_\_\_
207. Seminar in History of Geography. (2) II. Mr. Leighly
- \*208. Seminar in Economic Geography. (2) I. Mr. Parsons
- 219A-219B. Research. (1-5; 1-5) Yr.  
 The Staff (Mr. Sauer and Mr. Leighly in charge)

**GEOLOGICAL SCIENCES**

(Department Office, 203A Bacon Hall)

- Perry Byerly, Ph.D., *Professor of Seismology.*  
 Charles M. Gilbert, Ph.D., *Professor of Geology.*  
 Norman E. A. Hinds, Ph.D., *Professor of Geology.*  
 Charles Meyer, Ph.D., *Professor of Geology.*  
 Adolf Pabst, Ph.D., *Professor of Mineralogy.*  
 Nicholas L. Taliaferro, Ph.D., *Professor of Geology.*  
 Francis J. Turner, Sc.D., *Professor of Geology (Chairman of the Department).*  
 John Verhoogen, M.E., Ph.D., *Professor of Geology.*

\* Not to be given, 1954-1955.

Howel Williams, Sc.D., *Professor of Geology.*

George D. Louderback, Ph.D., LL.D., *Professor of Geology, Emeritus.*

Garniss H. Curtis, Ph.D., *Assistant Professor of Geology.*

Jack F. Evernden, Ph.D., *Assistant Professor of Geology.*

Robert L. Rose, M.A., *Associate in Geology.*

*Letters and Science List.*—All undergraduate courses in geological sciences are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

#### MAJOR IN GEOLOGY

*Departmental Major Adviser:* Mr. Curtis.

*Preparation for the Major.*—Required: Chemistry 1A–1B, Physics 2A–2B; Geology 5 (or 1); Geology 3; Mineralogy 6; Mathematics C. All of these courses must be completed in the lower division to avoid some delay in completion of the major.

Other lower division courses required or recommended before completion of the major are the following. *Required:* Mathematics 3A–3B; Engineering 1A–1B; Chemistry 5 or Metallurgy 2A for those intending to emphasize Mineralogy and Petrology or Mining Geology. *Recommended:* Mathematics 4A–4B; Physics 3A–3B; Paleontology 1 for those intending to emphasize Petroleum or Historical and Stratigraphic Geology; Chemistry 109 for those intending to emphasize Metalliferous Geology. Some of these courses (particularly Mathematics 3A–3B) should be included in the preparation for the major where possible, but delay in completion of the major does not normally result from postponing them to the upper division provided all other required lower division courses are completed.

In order to facilitate the arrangement of upper division courses in the major, the following recommendations are made regarding the scheduling of prerequisite lower division courses.

(1) Chemistry 1A–1B and Physics 2A–2B should be completed during the freshman year.

(2) Geology 5 (or 1) and 3, and Mineralogy 6 should be completed during the sophomore year; normally Geology 3 and Mineralogy 6 will be taken concurrently during the second semester of that year.

(3) Students intending to enroll in upper division geophysics courses must complete Mathematics 3A–3B in the lower division.

*The Major.*—Each program must include Geology 102A–102B (4), 103 (4), 118 (4) or 118L (6), and in addition one of the following groups of courses.

I. Emphasis on Mineralogy and Petrology: Geology 104A–104B (6), Mineralogy 103 (3), 107 (3), Chemistry 109 (3). Recommended electives are Geology 106A (3), 106B (3), 116 (2), Paleontology 102 (3), 112 (4), Chemistry 122 (3), Mineralogy 105 (2), and Soil Science 101 (3).

II. Emphasis on Mining Geology: Geology 104A–104B (6), 106A (3), 106B (3), and one of the following: Geology 116 (2), Mineralogy 103 (3), or Mining 111B (3). Recommended electives are Metallurgy 2A–2B (6), Mineralogy 105 (2), Geology 205A–205B (6), Paleontology 102 (3), 112 (4), Mining 107B (3), 111A (3), Soil Science 101 (3).

III. Emphasis on Petroleum Geology: Geology 111A–111B (6), 116 (2), Paleontology 111 (4), 112 (4). Recommended electives are Paleontology 102 (3), 114 (4), Geology 104A–104B (6), 107 (2), 106B (3), 121 (4), 122A–122B (4), Geography 109 (3), Soil Science 101 (3). Major students selecting this emphasis who intend to do postgraduate work in geology should include Geology 104A–104B in their major programs.

IV. Emphasis on Historical and Stratigraphic Geology: Geology 107 (2), 116 (2), 117 (3), Paleontology 111 (4), 112 (4). Recommended electives are Paleontology 102 (3), 114 (5), Geography 109 (3), Soil Science 101 (3).

V. Emphasis on Geophysics: Geology 116 (2), 121 (4), 122A-122B (4), and Mathematics 110A-110B (4). Recommended electives are Physics 105A-105B (6), Paleontology 102 (3), 112 (4), Geology 106A (3), 106B (3), 111A-111B (6).

The department will certify to the completion of a major program for graduation only on the basis of at least C grades in Geology 102A-102B and 103, and at least a C average in the upper division courses prescribed for the major. Students who do not maintain such an average may be required at any time to withdraw from the departmental major.

In exceptional cases, with consent of the major adviser, Geology 199 (4) may be substituted for Geology 118 or 118L in the major program.

Credits for courses completed in other departments or institutions will not be accepted as equivalent to Geology 102A-102B and 103.

#### MAJOR IN GEOPHYSICS

*Departmental Major Adviser:* Mr. Evernden.

*Preparation for the Major.*—Required: Chemistry 1A; Geology 5 (or 1), 3; Mathematics 3A-3B, 4A-4B; Mineralogy 6; Physics 4A-4B-4C.

*The Major.*—Required: Geology 102A-102B, 103, 121, 122A-122B; Mathematics 110A-110B; Physics 105A-105B, 110A-110B, 110C.

#### GEOLOGY

##### LOWER DIVISION COURSES

1. General Geology: Dynamical and Structural. (3) I. Mr. Hinds  
Three lectures and one demonstration and discussion section per week.  
Prerequisite: elementary chemistry.  
Not open to students who have taken Geology 10.  
A survey of the nature and structure of the materials composing the earth and of the processes that shape the earth's surface.
3. General Geology: Historical. (3) II. Mr. Hinds  
Three lectures and one demonstration and discussion section per week.  
Prerequisite: course 1, 5, or 10.  
Origin and geological history of the earth and the evolution of its animal and plant inhabitants.
5. General Geology. (3) II. Mr. Verhoogen  
Three lectures and one demonstration section per week.  
Prerequisite: Chemistry 1A; high school Physics or Physics 2A-2B (2B may be taken concurrently).  
A survey of the natural processes occurring in the earth, with special reference to their physical background.  
Recommended for majors in geology and geophysics.
10. Elementary Physiography. (3) II. Mr. Hinds  
Three lectures and one section meeting per week.  
Not open to students who have taken or are taking course 1 or 5.  
The earth's surface features and the geologic laws governing their origin and development. Principles underlying the evolution of topography under different climatic conditions.

## UPPER DIVISION COURSES

## 102A-102B. Field Geology. (2-2) Yr.

Mr. Gilbert, Mr. Rose, Mr. Evernden, Mr. Meyer,  
Mr. Taliaferro, Mr. Curtis

102A: Mr. Gilbert, Mr. Evernden, Mr. Curtis; 102B: Mr. Gilbert, Mr. Rose, Mr. Taliaferro, Mr. Meyer.

One lecture per week and field trips all day Saturday.

Prerequisite: course 103 (may be taken concurrently).

Training in the methods of field observation and mapping and in the interpretation of results.

102A. Inquiry into the geology of the Berkeley hills. Eight days in the field; one lecture and one laboratory per week for seven weeks.

102B. Inquiry into the geology of other areas adjacent to the Bay of San Francisco and in the Sierra Nevada. At least ten days in the field.

Reports will be prepared on the results of field work.

Concurrently with the field work, the class meets for lectures, exercises on topographic and geologic maps, and for discussion of methods.

## 103. Introduction to Petrology. (3-4) I and II.

Mr. Taliaferro, Mr. Rose, Mr. Curtis

I: Mr. Taliaferro, Mr. Rose; II: Mr. Curtis.

Two lectures and one or two three-hour laboratory periods per week. Students in metallurgy, mining, and petroleum engineering will be required to take one afternoon of laboratory work for 3 units of credit. Geology majors and students in the mineral exploration curriculum of the College of Engineering will take two afternoons of laboratory work for 4 units of credit.

Prerequisite: course 5 (or 1), Mineralogy 6, which must be completed prior to enrollment in 103.

Characteristics, origin, mode of occurrence, and nomenclature of rocks, and description of the more common types. Laboratory practice in determination of textures, mineral components, and systematic position of rocks by observation of hand specimens.

## 104A-104B. Microscopic Petrography Laboratory. (3-3) Yr. Mr. Williams

Lecture and two three-hour laboratory periods per week.

Prerequisite: Mineralogy 6, and for course 104B, course 103.

The optical properties of crystals, followed by determination of minerals and then of rocks by means of the microscope. Approximately one-third of the year is devoted to each of these three topics.

## 106A-106B. Economic Geology. (3-3) Yr.

Mr. Meyer, Mr. Curtis

106A (formerly numbered 106): Mr. Meyer; 106B (formerly numbered 108): Mr. Curtis.

Two lectures and one three-hour laboratory period per week.

Prerequisites: course 103 (may be taken concurrently), Chemistry 5. The genesis and geological characteristics of economic mineral deposits.

## 107. Geology of North America. (2) II.

Mr. Williams

Two lectures per week and occasional conference hours.

Prerequisite: course 3, 102A, and 103.

## 111A-111B. Petroleum Geology. (3-3) Yr.

Mr. Evernden

Prerequisite: course 5 (or 1), Physics 4A (or 2A-2B); course 102A-102B or consent of instructor; Geology 103 is desirable.

The geology of petroleum and of ground water; problems in subsurface structure and correlation.



116. Structural Geology. (2) II. Mr. Taliaferro  
Prerequisite: course 5 (or 1), 102A-102B.  
Deformation of the earth's crust; mountain growth; folding and faulting and their economic aspects; graphic solution of fault problems.
117. Geomorphology. (3) I. Mr. Hinds  
Two lectures per week and one additional conference hour.  
Students who have not completed course 102A-102B or who are not taking it concurrently will be admitted only by consent of the instructor.  
Nature, evolution, and classification of land forms; use of physiographic methods in elucidating the later geologic history of various regions and in interpreting conditions of the geologic past.
- 118, 118L. Advanced Summer Field Course. Mr. Taliaferro  
Prerequisite: course 102A-102B with grade of C or better.  
The aim of the course is to develop: (1) facility and accuracy in geological mapping; (2) ability to observe and interpret rocks, structures and physiographic features, and other geological phenomena; and (3) the capacity to execute independently a geological survey and prepare a suitable report. Satisfactory completion of this course satisfies the undergraduate thesis requirements for students whose major is geology.  
This work may be taken for credit during two or more summers; however, not more than 6 units of credit so gained will be accepted as part of the undergraduate major. 118 is a six weeks' course for which 4 units will be assigned. 118L is an eight weeks' course for which 6 units will be assigned.
120. Elementary Seismology. (2) I. Mr. Byerly  
Prerequisite: Geology 5 (or 1), Physics 2A or equivalent.  
A general nonmathematical discussion of earthquakes.
121. Practical Seismometry. (4) II. Mr. Byerly  
Three lectures and one three-hour laboratory period per week.  
Prerequisite: Physics 2A-2B, Mathematics 4A-4B.  
Paths of seismic waves and their relation to the structure of the earth, with emphasis on problems of seismic prospecting; elementary theory of the seismograph; laboratory analysis of seismograms and interpretation of travel-time curves in terms of structure.
- 122A-122B. Principles of Geophysics. (2-2) Yr. Mr. Verhoogen  
Two lectures per week, and occasional conference hours.  
Prerequisite: course 5 (or 1), Mathematics 110A-110B (may be taken concurrently), and Physics 4A-4B.  
122A. General geophysics.  
122B. Applications to geologic problems.
199. Special Study for Advanced Undergraduates. (1-4) I and II.  
The Staff (Mr. Curtis in charge)  
For properly qualified senior students who wish to undertake selected readings or research under the guidance of a member of the department.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 204A-204B. Elastic Waves. (2-2) Yr. Mr. Byerly, Mr. Evernden  
(Course 204A formerly numbered 204.)  
204A: Mr. Byerly; 204B: Mr. Evernden.  
Prerequisite: Mathematics 119A-119B, Physics 105A-105B or equivalent.  
The theory of stress and strain, and wave motion in elastic solids, with special application to seismic waves.

- 205A-205B. Laboratory Investigation of Ores. (3-3) Yr. Mr. Meyer  
Prerequisite: courses 104A-104B, and 106A-106B or equivalent.  
The application of laboratory methods and interpretative procedures to problems in metalliferous geology.
206. Seminar in Geology of Metalliferous Deposits. (2) I. Mr. Curtis  
Prerequisite: course 106A-106B.
207. Seminar in Volcanology. (2) I. Mr. Williams  
The origin and nature of volcanic processes; principal types of activity as exemplified by modern volcanoes; characters and classification of lavas and pyroclastic rocks.
208. Physics of Solids. (2) I. Mr. Verhoogen  
A survey of physical and chemical properties of solids, with reference to deformation of rocks and to the internal constitution of the earth.
- 209A-209B. Geology of California. (2-2) Yr. Mr. Taliaferro  
Prerequisite: course 102A-102B, 103, and a course in historical geology, such as course 3 or 107.  
Critical study of literature, with discussion of evidence and scientific method; the main reported facts and theories of the history of sedimentation, volcanism, the major earth movements, and geographical changes in California and bordering areas covered in reports, discussions, and occasional lectures.
- 210A-210B. Advanced Sedimentary Petrography. (3-2) Yr. Mr. Gilbert  
One lecture and two three-hour laboratory periods per week in 210A; laboratory only in 210B.  
Prerequisite: course 104A.  
210A. Mechanical and mineralogical analysis of sediments and sedimentary rocks. Determination of refractive indices and orientation of mineral grains.  
210B. Study of sedimentary rocks in thin section; identification of mineral grains.
212. Universal-Stage Petrography. (2) I and II. Mr. Turner  
Prerequisite: course 210A or 214A, and consent of instructor.  
Use of the universal stage in petrographic determinations and in petrofabric analysis.
213. Seminar in Geomorphology. (2) II. Mr. Hinds  
Prerequisite: course 117 or its equivalent.  
The topics to be considered will vary from year to year.
- 214A-214B. Advanced Petrology. (2-4; 2-4) Yr. Mr. Turner  
Prerequisite: course 104A-104B, Mineralogy 105 (may be taken concurrently). Recommended: Chemistry 122. A reading knowledge of French or German is required of candidates for the Ph.D. degree.  
Discussion of problems of petrogenesis. Microscopic study of suites of rock sections.  
Metamorphic and igneous rocks in alternate years; metamorphic, 1954-1955.
215. Seminar in Sedimentation. (2) II. Mr. Verhoogen  
Problems concerning origin and evolution of sedimentary rocks. Content of the course will vary from year to year. Chemical aspects of sedimentation will be considered in 1955.

216. Seminar in Structural Geology. (2) II. Mr. Taliaferro  
Prerequisite: course 102A-102B, 103, 116, and a course in historical geology.  
Folding and faulting, growth of mountains: a study of special topics in structural geology. Reports and discussions, with occasional lectures.
217. Advanced Seismometry. (2) II. Mr. Byerly  
The general mathematical theory of the seismograph; discussion of the problems of modern seismometry and of recent results.
- 218A-218B. Seminar in Seismology. (2-2) Yr. Mr. Byerly, Mr. Evernden  
218A: Mr. Byerly; 218B: Mr. Evernden.  
Critical study of original literature relating to seismological problems. The content will vary from year to year.
220. Research. (1-5) I and II. The Staff (Mr. Gilbert in charge)
298. Directed Studies. (2) I and II. The Staff (Mr. Verhoogen in charge)  
Prerequisite: graduate standing.  
Selected readings in geology and geophysics.

**MINERALOGY****LOWER DIVISION COURSE**

6. Introduction to Mineralogy. (4) I and II. Mr. Gilbert, Mr. Pabst  
(Formerly numbered 4A-4B.)  
I: Mr. Gilbert; II: Mr. Pabst.  
Two lectures and two three-hour laboratory periods per week.  
Prerequisite: Chemistry 1A and Physics 2A or equivalent.  
Determination of common rock-forming minerals, origin, relationships, and properties; study of simple crystals; use of blowpipe and chemical tests for minerals.

**UPPER DIVISION COURSES**

103. Mineralogy. (3) II. Mr. Pabst  
Prerequisite: Mineralogy 6, Geology 5 (or Geology 1) and Chemistry 1B. Recommended: Chemistry 5.  
Lectures on the principal groups of minerals, emphasizing chemical constitution and systematic relations; problems in the derivation of mineral formulas from analyses.
105. Paragenesis of Minerals. (2) I. Mr. Pabst  
Prerequisite: Mineralogy 103 and Geology 103. Recommended: Chemistry 109 or 110 and Chemistry 122.  
Lectures on some aspects of the formation and association of minerals.
107. Crystallography. (3) I. Mr. Pabst  
Prerequisite: Mathematics 3A-3B and consent of instructor.  
Lectures on geometrical crystallography including a discussion of space groups, Hermann-Mauguin symbols, the reciprocal lattice and the use of the stereographic and gnomonic projections.

**GRADUATE COURSES**

- Research. (See Geology 220.)
- \*284. Identification of Crystalline Materials. (2) II. Mr. Pabst  
Prerequisite: consent of instructor.  
Principles and practice of the identification of crystalline materials by various methods with emphasis on the use of powder X-ray diffraction methods.

\* Not to be given, 1954-1955; to be given, 1955-1956.

## GERMAN

(Department Office, 2323 Dwinelle Hall)

Arthur G. Brodeur, Ph.D., *Professor of Germanic Philology and English.*

Robert T. Clark, Jr., Ph.D., *Professor of German (Chairman of the Department).*

C. Grant Loomis, Ph.D., *Professor of German.*

<sup>1</sup> Philip Motley Palmer, Ph.D., *Professor of German.*

Archer Taylor, Ph.D., *Professor of German.*

Hans M. Wolff, J.D., Ph.D., *Professor of German.*

Clair Hayden Bell, Ph.D., *Professor of German, Emeritus.*

Edward V. Brewer, M.A., *Professor of German, Emeritus.*

Lawrence M. Price, Ph.D., *Professor of German, Emeritus.*

Edmund Kurt Heller, Ph.D., *Associate Professor of German, Emeritus.*

Franz Schneider, Ph.D., *Associate Professor of German, Emeritus.*

Alice P. Tabor, Ph.D., *Assistant Professor of German, Emeritus.*

Madison S. Beeler, Ph.D., *Associate Professor of German.*

<sup>1</sup> Marianne Bonwit, Ph.D., *Associate Professor of German.*

Erwin G. Gudde, Ph.D., *Associate Professor of German.*

Peter Bruning, Ph.D., *Assistant Professor of Dutch and German.*

Andrew O. Jászi, Ph.D., *Assistant Professor of German.*

Joseph Mileck, Ph.D., *Assistant Professor of German.*

Eugene E. Reed, Ph.D., *Instructor in German.*

Edith J. Lewy, M.A., *Associate in German.*

*Letters and Science List.*—All undergraduate courses in German are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Jászi.

*Preparation for the Major.*—German 1, 2, 3, 4, or their equivalents, completed satisfactorily.

*The Major.*—Requirement: 24 units in upper division courses, including one full year's course in composition and at least 6 units made up from the senior courses 107, 118A, 118B, 118C, 124, and 135A. Six of the 24 units may be related work in other departments. Attention is also directed to the courses listed under "Foreign Literature in Translation," page 168. Students looking forward to the secondary credential should include two of the survey courses 118A, 118B, and 118C, 131A–131B, 135A, and 140.

*Honors.*—To be recommended for honors at graduation, students must have completed with distinction the courses outlined for the major.

*Higher Degrees.*—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

### GERMAN

#### LOWER DIVISION COURSES

1. Elementary German. Beginners' Course. (4) I and II.  
Mr. Mileck in charge
12. Elementary German. Intensive Course. (8) I and II.  
Two hours daily, four times per week. Mr. Gudde, Mr. Mileck  
This course is equivalent to courses 1 and 2.

<sup>1</sup> In residence fall semester only, 1954–1955.

2. Elementary German (continuation of 1). (4) I and II. Mr. Mileck in charge  
Prerequisite: course 1 or two years of high school German.
3. Intermediate German. (4) I and II. Miss Bonwit in charge  
Prerequisite: course 2 or three years of high school German.  
Section 4 is for students primarily interested in conversational German.
- 3A. German Poetry. (1) I. Miss Lewy  
Prerequisite: German 2, or three years of high school German.
4. Intermediate German. (4) I and II. Miss Bonwit in charge  
Prerequisite: course 3 or four years of high school German.
- 1G. German for Graduate Students. (No credit) I and II. Miss Lewy in charge  
A course designed to prepare students for the graduate reading examinations. Sections will be offered in the humanities and the natural sciences.
- 3S. Scientific German. (3) I and II. Mr. Reed in charge  
Prerequisite: course 2 or equivalent. Open only to students in the colleges of Chemistry and Engineering, premedical and pre dental students, and students in the College of Letters and Science who are majoring or preparing for a major in one of the scientific departments.
- 4S. Scientific German. (3) II. Mr. Reed  
Prerequisite: course 3S or 3 or equivalent.
- \*4M. Medical German. (3) II. \_\_\_\_\_  
Prerequisite: course 3 or 3S or equivalent.
39. Great Writers in German Literature. (2)  
Any one of these courses is open to students in all departments of the University, major students in German excepted. No knowledge of German required.
- 39A. Medieval Period. (2) I, Mr. Taylor.  
39B. Eighteenth Century. (2) I, Miss Bonwit.  
39C. Nineteenth Century. (2) II, Mr. Clark.  
39D. Twentieth Century. (2) II, Mr. Loomis.

## UPPER DIVISION COURSES

Prerequisite: 16 units of lower division German courses.

100. Introduction to Modern German Literature. (3) I. Mr. Mileck
104. Dramas of the Nineteenth Century. (3) II. Mr. Jászi
106. Schiller's Dramas. (3) I. \_\_\_\_\_
107. Schiller's Poetry, Aesthetic and Historical Writings. (3) II. \_\_\_\_\_  
Prerequisite: 6 units of upper division courses in German literature.
108. Introduction to Goethe. (3) I. Mr. Loomis  
*Goetz von Berlichingen, Urfaust, Werther.*
109. Goethe's Verse Dramas; *Tasso, Iphigenie, Faust*, Part I. (3) II.  
Mr. Wolff

\* Not to be given, 1954-1955.

110. The German Ballad and Lyric Poetry except Goethe. (1) I. Mr. Loomis
111. Goethe's Poems. (1) II. Mr. Loomis
112. Survey of German Culture and Institutions. (3) II. Mr. Gudde  
Open to all upper division students who have a reading knowledge of German, and recommended for prospective teachers.
- \*115. Nietzsche. (3) I. Mr. Wolff  
Prerequisite: a reading knowledge of German.  
Lectures in English. Interpretations, collateral reading and reports.
- \*118A. History of German Literature in the Middle Ages. (3) I. Mr. Palmer  
Prerequisite: 6 units from any of the above-listed upper division courses.
- 118B. History of German Literature from the Reformation to the Romantic Movement. (3) II. Mr. Wolff  
Prerequisite: same as for course 118A.  
Course 118A is not prerequisite to 118B.
- 118C. History of German Literature from the Romantic Movement to 1900. (3) I. Miss Bonwit  
Prerequisite: same as for course 118A.  
Neither course 118A nor course 118B is prerequisite to 118C.
- \*124. German Poetry of the Twentieth Century. (2) II. Mr. Jászi  
Prerequisite: same as for course 118A.
125. Introduction to Folklore. (3) I. Mr. Taylor  
Prerequisite: senior standing (for major students in anthropology, junior standing) and the ability to read one foreign language.  
A survey of the materials of popular tradition, the folk song, the folk tale, the proverb, the riddle, and other forms. The methods and results of investigation in this field will be presented.
- 130A-130B. Advanced Grammar and Composition. (3-3) Yr. Mr. Palmer, Mr. Mileck
- 131A-\*131B. Advanced Grammar and Composition. (2-2) Yr. Mr. Jászi, Miss Bonwit  
Prerequisite: grade C or higher in course 130A-130B.
- 135A. Middle High German. (3) I. Mr. Bell  
Prerequisite: same as for course 118A. This course should be taken with or after (but not before) course 118A.  
Outlines of grammar; the *Nibelungenlied* and selected readings.
- \*135B. Middle High German. (3) II. Mr. Taylor  
Prerequisite: course 135A.  
Readings in Middle High German literature.
- \*140. The Pronunciation of German. (2) I. Mr. Beeler  
Designed for prospective teachers and those planning to take linguistic courses.
199. Special Study for Advanced Undergraduates. (1-3) I and II. Mr. Jászi in charge

\* Not to be given, 1954-1955.

## DUTCH

- \*1. Elementary Dutch. Beginners' Course. (3) I. Mr. Bruning  
 \*2. Elementary Dutch (continuation of 1). (3) II. Mr. Bruning

## GERMAN

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Prerequisite: for the literary courses, course 118A, 118B, or 118C; for students in linguistics, courses 135A and 140 are strongly recommended. For advanced study in German literature and linguistics a reading knowledge of French is indispensable and a general acquaintance with German history strongly advised. For linguistic work some previous study of Latin and Greek is highly desirable.

200. Bibliography of German Literary History. (2) I. Mr. Taylor  
 An introduction to the bibliographical tools used by the student in the fields of German linguistics, the history of German literature, and folklore.
203. Studies in Middle High German Literature. (2) I. Mr. Bell  
 Prerequisite: course 135A.
204. The Poetry of the Elder Edda. (3) II. Mr. Brodeur  
 Prerequisite: course 280.  
 Old Norse mythological and legendary poems read in the original.
205. German Literature During the Renaissance and Reformation. (3) II. Mr. Taylor
- \*206. German Literature During the Seventeenth Century. (2) I. Mr. Loomis
- \*214. Lessing and His Time. (2) I. Mr. Clark
220. Goethe to the Period of the Italian Journey. (2) I. Mr. Clark
- \*221. Goethe from the Period of the Italian Journey to His Death. (2) II. Mr. Wolff
228. Early German Romanticism: 1795-1810. (3) I. ———
229. Kleist, Büchner, Grabbe. (2) II. Mr. Wolff
- \*230. Grillparzer. (2) I. ———
- \*238. German Realism, 1850-1900. (2) II. Miss Bonwit
239. Interpretation and Criticism of German Poetry. (2) I. Mr. Jászi  
 Studies in Rilke.
249. Seminar in German Literature. (2 or 3) II.  
 The Staff (Mr. Clark in charge)  
 The topic for the spring semester: German Theories of Literary Criticism. (2), Mr. Clark.
298. Special Study for Graduate Students. (1-4) I and II.  
 Mr. Wolff in charge

\* Not to be given, 1954-1955.

*Germanic Linguistics*

For the courses in English philology, see the Department of English, page 154.

- \*260. Germanic Linguistics. (3) I. Mr. Beeler  
 Prerequisite: some acquaintance with at least two of the older Germanic languages.  
 Phonology, morphology, and lexicography of the Germanic languages; the relationship of the Germanic languages to one another; the reconstruction of Proto-Germanic; Proto-Germanic and Indo-European.
262. History of the German Language. (3) I. Mr. Palmer
265. Gothic. (3) II. Mr. Beeler
- \*275. Old High German. (3) II. Mr. Palmer
280. Old Icelandic. (3) I. Mr. Beeler
- \*281. The Icelandic Saga. (2) II. Mr. Beeler  
 Prerequisite: course 280.  
 One of the longer Icelandic sagas will normally be read in this course.
290. Seminar in Germanic Linguistics. (2 or 3) II. Mr. Beeler  
 Topic: German Dialectology.

## RELATED COURSES

Romanticism in Western Europe (Comparative Literature 121).

The Symbolist Movement in European Literature (Comparative Literature 201A-201B).

**GREEK**

For courses in the Greek language and literature, see under Department of Classics, page 73.

**HISTORY**

(Department Office, 3303 Dwinelle Hall)

Woodbridge Bingham, Ph.D., *Professor of Far Eastern History and Director of the Institute of East Asiatic Studies.*

Carl Bridenbaugh, Ph.D., *Margaret Byrne Professor of United States History.*

George H. Guttridge, M.A. (Cantab.), *Professor of English History.*

\* George P. Hammond, Ph.D., *Professor of History and Director of the Bancroft Library.*

Lawrence A. Harper, J.D., Ph.D., *Professor of American History.*

John D. Hicks, Ph.D., *A. F. and May T. Morrison Professor of History.*

James F. King, Ph.D., *Professor of History (Chairman of the Department).*

Lawrence Kinnaird, Ph.D., *Professor of History.*

Franklin C. Palm, Ph.D., *Professor of Modern European History.*

† Engel Sluiter, Ph.D., *Professor of History.*

\* Not to be given, 1954-1955.

† Absent on leave, 1954-1955.

‡ In residence spring semester only, 1954-1955



Raymond J. Sontag, Ph.D., *Sidney Hellman Ehrman Professor of European History.*

<sup>1</sup> Kenneth M. Stampp, Ph.D., *Professor of History (Vice-Chairman of the Department).*

Robert J. Kerner, Ph.D., LL.D., Litt.D., *Sather Professor of History, Emeritus, and Director of the Institute of Slavic Studies, Emeritus.*

John J. Van Nostrand, Ph.D., LL.D., *Professor of Ancient History, Emeritus.*

Walton E. Bean, Ph.D., *Associate Professor of History.*

\* Delmer M. Brown, Ph.D., *Associate Professor of History.*

George V. Lantzeff, Ph.D., *Associate Professor of History.*

Henry F. May, Ph.D., *Associate Professor of History.*

Paul B. Schaeffer, Ph.D., *Associate Professor of European History.*

Robert J. Brentano, D.Phil. (Oxon.), *Assistant Professor of History.*

William N. Davis, Ph.D., *Assistant Professor of History.*

Gordon Griffiths, Ph.D., *Assistant Professor of History.*

Reuben H. Gross, Jr., D.Phil. (Oxon.), *Assistant Professor of History.*

David L. Hoggan, Ph.D., *Acting Assistant Professor of History.*

Frank W. Iklé, Ph.D., *Acting Assistant Professor of History.*

Charles Jelavich, Ph.D., *Assistant Professor of History.*

\* Joseph R. Levenson, Ph.D., *Assistant Professor of History.*

Edwin Lieuwen, Ph.D., *Acting Assistant Professor of History.*

Armin Rappaport, Ph.D., *Assistant Professor of History.*

Toshio G. Tsukahira, Ph.D., *Acting Assistant Professor of History.*

Gene A. Brucker, Ph.D., *Instructor in History.*

John W. Snyder, Ph.D., *Instructor in History.*

*Introductory Courses.*—Courses 4A–4B and 8A–8B are open to all students, but 4A should be taken preferably before 8A by freshmen; course 17A–17B is open to all students above the freshman year; the A part of any of the introductory courses should ordinarily precede the B part.

*Foreign Language in the Lower Division.*—All students who intend to take upper division courses in history are advised to acquire a reading knowledge of at least one of the following languages before they reach their junior year: French, German, Italian, Latin, Spanish.

*Letters and Science List.*—All undergraduate courses in history are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*The American History requirement* may be satisfied by completing any one of the following courses in history: 8B, 17A, 17B, 167A, 167B, 170A, 170B, 171A, 171B, 172A, 172B, 173A, 173B, 173C, 174A, 174B, 175A, 175B, 176A, 176B, 177A, 177B, 187A, 187B.

*Departmental Major Advisers:* Mr. Schaeffer, Chairman; Mr. Davis, Mr. Gross, Mr. Iklé.

*Preparation for the Major.*—Required: History 4A–4B; and 8A–8B or 17A–17B (according to the intended field of concentration); and either Economics 1A or Geography 1.

*The Major.*—Students majoring in history must complete 24 upper division units in history, including:

- (a) *In the junior year:* History 101 and at least one year course of broad scope, preparatory to more specialized work in the same field (Europe, Western Hemisphere, Far East).
- (b) *In the junior or senior year:* a second-year course in a different field from that chosen under (a) above.

\* Absent on leave, 1954–1955.

<sup>1</sup> In residence fall semester only, 1954–1955.

- (c) *In the senior year:* some concentration in one of the fields already studied, to be determined in consultation with the adviser.
- (d) A year's work in the history of the United States, if this has not already been taken in the lower division.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the major in history.

*Honor Students in the Upper Division.*—Students who complete a major in history with distinction are eligible for recommendation for honors upon passing the comprehensive examination. Attention is directed to course 198 and to the CIRCULAR OF INFORMATION, BERKELEY, concerning Honors.

*Teacher-Training Curricula.*—The curriculum for the Certificate of Completion (with a teaching major in social studies) differs from that of the undergraduate major in history both in the list of prescribed courses and in the requirement of at least 1.75 grade points per unit. For further information concerning the teaching-training curriculum, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, and consult the graduate adviser.

*Higher Degrees.*—Students planning to work toward the degrees of M.A. and Ph.D. should consult the ANNOUNCEMENT OF THE GRADUATE DIVISION and the Graduate Division bulletin entitled ANNOUNCEMENT IN THE SOCIAL SCIENCES, and confer with the graduate adviser.

#### LOWER DIVISION COURSES

In courses 4A–4B, 8A–8B and 17A–17B weekly sections are organized to give supplementary instruction in historical geography, map work, bibliography, and methods of historical study.

4A–4B. History of Western Europe. (3–3) Yr. Beginning each semester.

Mr. Jelavich, Mr. Palm, Mr. Griffiths

Course 4A is prerequisite to 4B for freshmen.

8A–8B. History of the Americas. (3–3) Yr.

Mr. Lieuwen

17A–17B. History of the United States. (3–3) Yr. Beginning each semester.

Mr. Bean, Mr. Davis, Mr. Hicks, Mr. May, Mr. Rappaport, Mr. Stampf

Prerequisite: sophomore standing. A student may not receive credit for both History 17A–17B and History 171A–171B.

#### UPPER DIVISION COURSES

101. Introduction to Historical Method and Bibliography. (3) I and II.

Mr. Brentano

Prescribed in the junior year for, and restricted to, students majoring in history. Emphasis will be placed upon exercises in individual research and in the use of the Library. Enrollment is limited.

102. Proseminar. (3) I.

Mr. May

Prerequisite: consent of instructor.

Reading, discussion, and the presentation of critical essays on selected topics. Ordinarily open only to seniors whose major is history.

111A–111B. Ancient History. (3–3) Yr.

Mr. Snyder

111A. Greek history to the Roman conquest.

111B. Roman history to the fourth century A.D.

- \*113. History of Ancient Mediterranean Colonization. (3) I. \_\_\_\_\_
- \*115A-115B. Byzantium. (3-3) Yr. \_\_\_\_\_  
 115A. The Eastern Empire to 700.  
 115B. 700-1453.
- 121A-121B. Medieval History. (3-3) Yr. Mr. Schaeffer  
 121A. 500 to 1100.  
 121B. 1100 to 1500.
122. Medieval Culture. (3) I. Mr. Schaeffer
123. Medieval France. (3) II. Mr. Schaeffer
- \*125A-125B. Medieval Thought and Institutions. (3-3) Yr. \_\_\_\_\_  
 125A. Carolingian Europe (700-900).  
 125B. Empire and Papacy (900-1100).
- 131A-131B. History of Europe in the Early Modern Period (1500-1789).  
 (3-3) Yr. Mr. Griffiths
132. The Renaissance. (3) I. Mr. Brucker  
 Prerequisite: course 131A-131B or consent of instructor.
133. The Reformation: The Protestant Revolution and the Counter-Reformation. (3) II. Mr. Brucker  
 Prerequisite: course 131A-131B or consent of instructor.
- 134A-134B. Western Europe: Its Cultural History since the French Revolution. (3-3) Yr. Mr. Sontag
- 135A-135B. History of Russia and Poland to the Crimean War. (3-3) Yr. Mr. Lantzeff
- 136A-136B. History of Russia and Poland since the Crimean War. (3-3) Yr. Mr. Kerner  
 136A. Internal History of Russia and Poland with emphasis on Soviet Russia.  
 136B. Russia and the Soviet Union in world politics and world economics.
- \*137A-137B. History of Russian Civilization. (2-2) Yr. Mr. Lantzeff
- 138A-138B. History of Russian Central Asia, Siberia, and Alaska. (3-3) Yr. Mr. Lantzeff
- \*139A-139B. History of Southeastern Europe and the Near East. (3-3) Yr. Mr. Jelavich  
 Principally the history of the Ottoman Empire, Turkey, Yugoslavia, Rumania, Bulgaria, Greece, and Albania.
- 140A-140B. The Habsburg Monarchy and the Succession States. (2-2) Yr. Mr. Jelavich  
 Primarily the history of Austrians, Czechs, Slovaks, Magyars, Poles, Rumanians, Croats, and Slovenes since 1800, especially the formation and development of the national states which followed the dissolution of the Habsburg Empire.
- \*141. History of Modern France. (3) I. Mr. Palm
- \*142A-142B. History of Modern Italy. (3-3) Yr. Mr. Griffiths  
 142A. Renaissance.  
 142B. Risorgimento.

\* Not to be given, 1954-1955.

- 143A-143B. History of Germany. (3-3) Yr. Mr. Hoggan  
Prerequisite: course 4A-4B or 17A-17B.  
143A takes up the history of the Holy Roman Empire from the 9th century to 1806, and 143B continues with a treatment of Germany in the 19th and 20th centuries.
- 144A-144B. European Diplomatic History. (3-3) Yr. Mr. Sontag  
144A. 1848 to 1914.  
144B. 1914 to the present.
145. The Revolutionary Era in Europe. (3) I. Mr. Palm
146. Europe Since 1870. (3) II. Mr. Palm
- \*148. Recent World History. (3) Mr. Kerner  
The historical background since the First World War and the current situation in world politics and world economics.
- 149A-149B. The Diplomatic History of Europe from 1648 to 1848. (2-2) Yr. Mr. Hoggan  
149A will present the entire field of European diplomatic relations from 1648 to 1740, and 149B will continue this presentation from 1740 to 1848.
150. Medieval England. Mr. Brentano  
150A. Survey to 1485. (3) I. (Formerly numbered 150.)  
150B. Constitutional History through the Tudors. (3) II. (Formerly numbered 152A.)  
\*150C. Intellectual History, Bede to John Donne. (3) II.
- 151A-151B. History of England, from 1485 to the Present. (3-3) Yr.  
151A. 1500-1750. Mr. Guttridge  
151B. 1750 to the present.
- 155A-155B. The British Commonwealth and Empire. (3-3) Yr. Mr. Gross  
155A: To 1870.  
155B: Since 1870.  
Prerequisite: course 151B or equivalent.
156. History of Canada. (3) I. Mr. Gross  
History of Canada from the early European settlements to its present status as a member nation of the Commonwealth. Emphasis will be placed both on internal developments and on the imperial connection with Great Britain.
157. Burke and His Age, 1750-1800. (2) I. Mr. Guttridge  
Reading and discussion.  
Prerequisite: course 151A-151B or equivalent.
159. Recent History of Great Britain, 1900 to the Present. (3) II. Mr. Gross
- 160A-160B. History of Spain and Portugal. (3-3) Yr. Mr. Lieuwen
- 161A-161B. Hispanic-American History. (3-3) Yr. Mr. King  
161A. The Colonies.  
161B. Since Independence.

\* Not to be given, 1954-1955.

- \*162. History of the Caribbean Area. (3) I. Mr. King  
Caribbean history from the eighteenth century to the present. The rise and decline of the sugar colonies and of slavery, revolution and independence, international relations, and evolving economic, social and political patterns in colonies and free areas all receive attention.
- \*163. History of Brazil. (3) II. Mr. Sluiter
- \*166A-166B. History of Mexico. (2-2) Yr. Mr. Hammond  
166A. Colonial Period.  
166B. National Period.
- 167A-167B. The Diplomatic History of the United States. (3-3) Yr. Mr. Rappaport  
167A. 1776-1880.  
167B. 1880 to the present.
168. History of Inter-American Relations. (3) II. Mr. Lieuwen  
History of the relations of the Hispanic-American nations among themselves and with the United States since independence. Emphasis will be placed on the Pan-American movement and the development of the Organization of American States.
- 170A-170B. American Colonial History. (3-3) Yr. Mr. Bridenbaugh  
170A. The American Colonies to 1763.  
170B. The American Revolution, 1763-1789.
- 171A-171B. History of the United States. (3-3) Yr. Mr. Harper  
171A. To the end of Reconstruction.  
171B. From the end of Reconstruction to the present.  
A student may not receive credit for both History 17A-17B and History 171A-171B.
- 172A-172B. Constitutional History of the United States. (2-2) Yr. Mr. Harper  
Prerequisite: course 17A-17B or consent of instructor.
- 172C-172D. Constitutional History of the United States. (1-1) Yr. Mr. Harper  
A discussion group for students enrolled in 172A-172B who wish to do additional work in the same field.
173. The Era of Sectional Conflict. Mr. Stamp  
173A. The Old South. (3) I.  
\*173B. The Era of the Civil War, 1850-1865. (3) II.  
173C. Reconstruction and the New Nation, 1865-1900. (3) II.  
173A is not prerequisite to 173B; 173B is not prerequisite to 173C.
- 174A-174B. Recent History of the United States. (3-3) Yr. Mr. Hicks  
174A. 1900-1925.  
174B. 1925 to the present.
- 175A-175B. Intellectual History of the United States. (3-3) Yr. Mr. May  
175A. To 1865.  
175B. 1865 to the present.
- 176A-176B. Social History of the United States. (3-3) Yr. Mr. Bridenbaugh  
176A. 1763-1865; II.  
176B. 1865 to the present.

---

\* Not to be given, 1954-1955.

- 177A-177B. History of the United States, 1787-1845. (3-3) Yr. Mr. Bean  
 177A. The Constitution and the Early Union to 1815.  
 177B. The Jacksonian Era.
- 181A-181B. The History of North America. (3-3) Yr.  
 181A. The Colonial Period. Mr. Lieuwen, Mr. Kinnaird  
 181B. The North American Nations.
- \*183. Economic Exploitation of Colonial America. (3) II. Mr. Sluiter
- 187A-187B. The West in United States History. (2-2) Yr. Mr. Davis
- \*188. The Opening of the Pacific, 1513-1800. (3) II. Mr. Sluiter  
 A history of European penetration, occupation, rivalry, and influence  
 in the Pacific Area from the sixteenth through the eighteenth centuries.
- 189A-189B. History of California. (2-2) Yr. Mr. Kinnaird  
 189A. Spanish and Mexican Period.  
 189B. American Period.
- 190A-190B. Introduction to the History of Asia. (3-3) Yr. Mr. Iklé  
 190A. To 1600.  
 190B. Since 1600.  
 Survey of political and cultural history of major countries of Asia  
 from ancient to modern times. Development of civilizations of China,  
 India, Iran, Arabia, Turkey, Mongolia, Japan, Southeast Asia. Relations  
 with western Europe, Russia, and America.
- 192A-192B. Far Eastern Diplomatic History. (2-2) Yr. Mr. Iklé
- 193A-\*193B. The Middle Periods of Chinese History, 600-1600. (2-2) Yr.  
 193A. 600-960; 193B. 960-1600. Mr. Bingham  
 Prerequisite: an elementary knowledge of Chinese history.  
 A study of Chinese life from the Sui-T'ang period to the end of the  
 Ming.
- \*194A-194B. History of Modern China. (3-3) Yr. Mr. Levenson  
 194A. History of China to the fall of the Ming Dynasty (17th Cen-  
 tury).  
 194B. History of China since the fall of the Ming Dynasty. Emphasis  
 will be placed on the interplay of political, economic, and cultural forces  
 in "traditional" and "transitional" China, the Chinese background of con-  
 temporary Chinese conflict.
- \*194C. Intellectual History of Modern China. (2) II. Mr. Levenson  
 Prerequisite: an elementary knowledge of Chinese history.  
 Traditionalism and iconoclasm in China since its 16th-century contact  
 with the West. Attention will be focused on the distinction between the  
 study of intellectual history and the study of abstract ideas, and on the  
 connection between intellectual change and social change. Analysis will be  
 made of the links between formal philosophy, canons of esthetic taste and  
 popular points of view, and of the modern Chinese trends in these areas.
- 195A-195B. History of Japan. (3-3) Yr. Mr. Tsukahira  
 195A. Period of Chinese Influence.  
 195B. Period of Western Influence.
- \*196. History of Japanese Nationalism. (3) II. Mr. Brown

\* Not to be given, 1954-1955.

- 196C. The Modernization of Japan. (2) II. Mr. Tsukahira  
Detailed survey of Japan's social and economic development, 1700-1900. Japan's transformation from a semi-feudal to a modern industrial society. Structure and nature of Japanese society in Tokugawa Japan, and after the Meiji Restoration.
- \*197A-197B. Korean History. (2-2) Yr. \_\_\_\_\_
198. Individual Conferences and Assigned Reading. (3) I and II. Mr. Schaeffer in charge  
Intended for honor students, whose major is history, in their final semester before graduation.
199. Special Study for Advanced Students. (1-4) I and II. The Staff  
Open to senior and graduate students only.  
Prerequisite: for students whose major is history, at least a B average in all history courses undertaken; for others, at least a B average in all courses undertaken.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Advanced Studies in the Sources and General Literature of the Several Fields of History. (3) I and II. The Staff  
I. Ancient History, Mr. Snyder; United States History, Mr. Bridenbaugh, Mr. Rappaport; English History, Mr. Gross; Japanese History, Mr. Tsukahira.  
II. Chinese History, Mr. Bingham; United States History, Mr. Stamp; English History, Mr. Guttridge; Medieval and Early Modern History, Mr. Brucker; European History, Mr. Jelavich.
202. Historical Method and Bibliography. (3) I and II. Mr. Harper, Mr. Brentano  
Designed especially for candidates for higher degrees in history. Stress is laid on practical exercises.
- \*205. Historical Auxiliaries to Medieval Studies. (3) Mr. Brentano
- \*211A-211B. Seminar in Ancient History. (3-3) Yr. \_\_\_\_\_
- 221A-221B. Seminar in Medieval History. (3-3) Yr. Mr. Schaeffer
- 225A-\*225B. Seminar in Early Medieval History and 15th-Century England. (3-3) Yr. Mr. Brentano
- 231A-231B. Seminar in Early Modern European History. (3-3) Yr. Mr. Griffiths
- 232A-\*232B. Seminar in Late Medieval and Early Modern European History. (3-3) Yr. Mr. Brucker
- 235A-235B. Seminar in Russian History. (3-3) Yr. Mr. Lantzeff
- 236A-236B. Seminar in Modern Slavic History. (3-3) Yr. Mr. Kerner
- 239A-\*239B. Seminar in Central and Southeastern Europe. (3-3) Yr. Mr. Jelavich
- 241A-241B. Seminar in Modern European History. (3-3) Yr. Mr. Palm

\* Not to be given, 1954-1955.

- 243A-243B. Seminar in Modern European History. (3-3) Yr. Mr. Hoggan
- 244A-244B. Seminar in Modern European History. (3-3) Yr. Mr. Sontag
- 251A-251B. Seminar in English History. (3-3) Yr. Mr. Guttridge
- 255A\*-255B. Seminar in the History of the British Empire and Commonwealth. (3-3) Yr. Mr. Gross
- \*260A-260B. Seminar in the History of Spain. (3-3) Yr. \_\_\_\_\_  
Prerequisite: course 160A-160B, a reading knowledge of Spanish, and French or German.
- 261A-261B. Seminar in Hispanic-American History. (3-3) Yr. Mr. King
- \*266A-266B. Seminar in Mexican History. (3-3) Yr. Mr. Hammond
- 267A\*-267B. Seminar in the Diplomatic History of the United States. (3-3) Yr. Mr. Rappaport  
Prerequisite: course 167A-167B.
- 271A-271B. Seminar in the History of the American West. (3-3) Yr. Mr. Davis
- 272A\*-272B. Seminar in the Colonial Period of United States History. (3-3) Yr. Mr. Harper
- 273A\*-273B. Seminar in the History of the Old South, the Civil War and Reconstruction. (3-3) Yr. Mr. Stampf
- 274A-274B. Seminar in the Recent History of the United States. (3-3) Yr. Mr. Hicks
- 275A\*-275B. Seminar in the Intellectual History of the United States. (3-3) Yr. Mr. May
- 276A\*-276B. Seminar in American Social History, 1700-1900. (3-3) Yr. Mr. Bridenbaugh
- 277A-277B. Seminar in the Early National Period of United States History. (3-3) Yr. Mr. Bean
- 281A-281B. Seminar in North American History. (3-3) Yr. Mr. Kinnaird
- \*283A-283B. Seminar in Hispanic-American History. (3-3) Yr. Mr. Sluiter
- 290A-290B. Seminar on the History of Asia. (3-3) Yr. Mr. Iklé  
Seminar for advanced history students on materials in Asiatic history.
- 291A-291B. Seminar in the History of the Far East. (3-3) Yr. Mr. Bingham
- \*294A-294B. Seminar in the History of Modern China. (3-3) Yr. Mr. Levenson
- 295A-295B. Seminar in Japanese History. (3-3) Yr. Mr. Tsukahira
298. Directed Research. (2-4) I and II. The Staff

\* Not to be given, 1954-1955.



## HOME ECONOMICS

(Department Office, 117 Home Economics Building)

Jessie V. Coles, Ph.D., *Professor of Home Economics (Chairman of the Department)*.

Ruth Okey, Ph.D., *Professor of Home Economics*.

Agnes Fay Morgan, Ph.D., *Professor of Home Economics, Emeritus*.

Bessie B. Cook, Ph.D., *Associate Professor of Home Economics*.

Helen L. Gillum, Ph.D., *Associate Professor of Home Economics*.

Judson T. Landis, Ph.D., *Associate Professor in Family Sociology*.

Catherine Landreth, Ph.D., *Associate Professor of Home Economics and Lecturer in Psychology*.

M. Virginia Jones, Ph.D., *Assistant Professor of Textiles*.

Barbara M. Kennedy (Barbara Kennedy Johnson), Ph.D., *Assistant Professor of Home Economics*.

Lotte Arnrich, Ph.D., *Instructor in Home Economics*.

Clark E. Vincent, Ph.D., *Instructor in Family Sociology*.

Margaret B. Hanson, M.S., *Associate in Home Management and Lecturer in Education and Supervisor of the Teaching of Home Economics*.

Agnes C. McClelland, M.A., *Associate in Home Economics*.

Dorothy M. Sidwell, M.S., *Associate in Home Economics*.

Valeria Smola, M.A., *Associate in Home Management*.

Winifred Wilkinson, B.S., *Associate in Institution Administration*.



Ruth L. Huenemann, D.Sc., *Lecturer in Home Economics*.

Barbara I. Keane, M.S., *Lecturer in Home Economics*.

Evelyn Peters, M.A., *Lecturer in Home Economics*.

*Curriculum in Home Economics.*—The requirements for this curriculum offered in the College of Agriculture are stated in the CIRCULAR OF INFORMATION, BERKELEY.

### LOWER DIVISION COURSES

- 1A-1B. Experimental Food Study. (3-3) Yr. Beginning each semester.  
 1A: I and II; 1B: II. Miss Kennedy  
 Lecture and laboratory.  
 Prerequisite: Chemistry 1A, 8. Recommended: Bacteriology 1 or 2.  
 Production and composition of food and principles involved in food preparation and preservation.
6. Introduction to Textiles. (3) II. Miss Jones  
 Lectures and laboratory.  
 Prerequisite: Chemistry 1A, 8.  
 Study of plant, animal, and synthetic fibers used in textiles and of the finished textile materials.
7. Elementary Clothing Study. (3) I and II. Miss McClelland, Mrs. Keane  
 Lecture and laboratory.  
 Prerequisite: Decorative Art 6A-6B.  
 Practical and cultural problems in modern garment design and construction.
10. Elementary Nutrition. (2) II. Mrs. Cook  
 A nontechnical presentation of the modern knowledge of foods and nutrition.

11. Principles of Food Preparation. (2) II. Miss Kennedy  
A discussion of food composition, preparation and choice; designed for students not enrolled in the Home Economics curriculum.
12. Euthenics. (2) II. Mrs. Hanson  
A study of the function of the family and the homemaker in modern society, and of the contributions of the basic sciences and arts to the solution of present-day social and economic problems of the individual and the family.
13. Youth and Marriage. (2) I and II. Mr. Landis  
A functional course treating courtship, mate selection, marriage adjustment, and parenthood. Open to all students.
14. Consumer Problems. (2) II. Miss Coles  
A nontechnical discussion of consumers' problems, including income apportionment, consumer credit, buying aids, and protection of consumers.

## UPPER DIVISION COURSES

*Food Economics and Technology*

100. Food Economics. (3) I. Mrs. Hanson  
Lectures and field or laboratory work.  
Prerequisite: courses 1A-1B, 141 (may be taken concurrently).  
Discussion and field observation of food production and distribution; their relation to food consumption and expenditures. Food buying for families and institutions; factors affecting price and quality; food legislation.
- 101A. Food Analysis. (3) I. Miss Kennedy  
Lecture and laboratory.  
Prerequisite: course 1A-1B, Chemistry 1B, 8; or Chemistry 1B and 8 with grades of at least B.  
The principles of quantitative analysis applied to food materials; chemical analysis of typical carbohydrate, fat, and protein foods.
- \*101B. Advanced Food Analysis. (3) II. Miss Kennedy  
Lecture and laboratory.  
Prerequisite: course 101A or Chemistry 5 with a grade of at least B.  
Official analytical methods and legal standards used in the chemical analysis of sugars, grain products, dairy products, fats and oils, meats, etc. Examination of foods for deterioration and adulteration.
108. Introduction to Research in Food Preparation and Control. (2) II.  
Two laboratory periods a week to be arranged. Miss Kennedy  
Prerequisite: course 109 (to be taken concurrently).
109. Recent Advances in Food Technology. (2) II. Miss Kennedy  
Prerequisite: course 101A.  
A proseminar on late research in the chemistry of food composition, preparation, and control.

*Nutrition and Dietetics*

111. Nutrition. (3) I. Mrs. Cook  
Prerequisite: Chemistry 1A or high school chemistry and Physiology 1.  
A brief study of the essential nutrients and their functions in nutri-

tion; how to determine and satisfy the food needs of the normal individual.

(Not accepted as part of the general major of the Home Economics curriculum and not open to students who have credit for course 10.)

- 112A-112B. Nutrition and Dietetics. (3-3) Yr. Mrs. Cook  
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.
114. Laboratory Methods in Metabolism. (4) II. Miss Okey  
Lectures and laboratory.  
Prerequisite: course 101A or Chemistry 5; Biochemistry 102 (may be taken concurrently).  
Study of qualitative and quantitative reactions and procedures used in the analysis of biological materials of importance in nutrition.
115. Therapeutic Dietetics. (3) II. Mrs. Cook  
Lectures and laboratory.  
Prerequisite: course 118A-118B (may be taken concurrently).  
Problems in the planning and computation of dietaries for normal and pathological conditions.
- 118A-118B. Human Nutrition. (4-4) Yr. Miss Okey, Miss Arnrich  
Prerequisite: course 101A and Biochemistry 102, or courses 101A and 114.  
The fundamentals of nutrition established through typical experiments in calorimetry, digestion, nitrogen and mineral balances, vitamin tests; and the applications of these principles to practical feeding problems.
119. Vitamin Analysis. (3) I. Miss Arnrich  
Prerequisite: course 114; Biochemistry 102 or equivalent, and consent of instructor.  
Official chemical, physical, microbiological and biological assay methods for vitamins. Individual problems pertaining to animal tissue analysis, comparison of new methods with standard procedures.

#### *Institution Economics*

121. Institution Food Study. (4) I. Miss Gillum, Miss Wilkinson  
Lectures, field or laboratory work.  
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 field or laboratory work. Miss Gillum, Miss Wilkinson  
Prerequisite: course 121 or consent of instructor. Recommended: Business Administration 1A or 10, 151, or Psychology 3 or 185.  
The principles and problems involved in the organization and management of institution households such as residence halls, hospitals, hotels.

#### PROFESSIONAL COURSES

426. Hospital Problems. (2 or 3) I and II. Miss Gillum  
Supervised practice in administrative problems of the hospital dietetic service carried on during residence in Berkeley, and open only to selected graduate students.

427. Hospital Dietetics. (6) I and II. Miss Gillum  
 Conferences and supervised practice in the dietetics department of the University of California Hospital and clinics.  
 Open only to selected graduate students.

*Child Development and Family Relationships*

132. Child Psychology. (3) I. Miss Landreth  
 Prerequisite: Psychology 1A, 5. Not open to students who are taking or have taken Psychology 112.  
 A study of the factors concerned in the motor, sensory, language, mental, emotional, and social development of young children.
133. Laboratory in Child Development. (1) I. Miss Landreth, Mrs. Sidwell  
 One lecture per week and observation to be arranged three hours one day per week.  
 Prerequisite: course 132 (may be taken concurrently).  
 Laboratory supplement to course 132 conducted at the nursery school.
135. Techniques with Young Children. (3) I and II. Miss Landreth, Miss Peters, Mrs. Sidwell  
 Lectures twice a week, and laboratory in the nursery school two mornings or two afternoons per week.  
 Prerequisite: course 132 and consent of instructor.
137. Marriage and Family Relationships. (3) I and II. Mr. Landis  
 A survey of the most recent information on courtship, mate selection, husband-wife adjustments, and parent-child relationships.
138. The Contemporary American Family. (3) I and II. Mr. Vincent  
 Prerequisite: 6 units of Psychology and/or Sociology and Social Institutions.  
 An examination of the results of the impact of modern culture upon the family with emphasis upon family types, member relationships, family dynamics in relation to personality, social change and social values.
139. The Sociology of Child Development. (3) I. Mr. Vincent  
 An analysis of various social factors, social groupings, and social contexts in relation to the social development of the child.

PROFESSIONAL COURSE

435. Nursery School Administration. (3) II. Miss Landreth  
 Lectures twice a week, supervised practice in nursery schools and related field work, six hours per week.  
 Open only to selected graduate and senior students completing the major in child development.

*Family Economics*

140. Home Management. (3) I and II. ———  
 Lectures and laboratory.  
 Prerequisite: Physiology 1; Psychology 1A.  
 Use of time, energy, and equipment in the home from the viewpoint of the satisfaction of members of the family.
- 140L. Home Management Laboratory. (1-3) I and II. ———  
 Prerequisite: course 140.  
 Laboratory includes home projects or living for six to eight weeks in the home-management house under supervision of the instructor. A two-hour weekly conference to be arranged.

- \*141. Consumers and the Market. (3) I. Miss Coles  
Prerequisite: Economics 1A-1B (may be taken concurrently).  
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.  
Not open to students who are taking or have taken Agricultural Economics 101A or Business Administration 160.
142. Social Problems of Families. (3) II. Miss Coles  
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.  
Present-day problems of families as they are related to economic and social conditions.
144. Family Finance. (3) I. Miss Coles  
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.  
Management of personal and family finances—money income, household production, planning expenditures, credit, savings, investments, financing home ownership.

*Home Furnishing*

- \*152. Home Furnishing. (3) II. \_\_\_\_\_  
Prerequisite: Decorative Art 6A-6B, 130A-130B (130B may be taken concurrently).  
A nonprofessional course designed to develop discrimination in values. A consideration of materials and their use involved in furnishing the home, and an analysis of current trends and available materials.

*Clothing and Textiles*

160. Textiles. (3) I. Miss Jones  
Lecture and laboratory.  
Prerequisite: course 6.  
Technical analyses and evaluations of textile fibers and fabrics.
162. Clothing Economics. (3) I. Miss Jones  
Lectures and laboratory.  
Prerequisite: course 6; Economics 1A-1B.  
A study of the problems involved in the selection, purchase, and care of household textiles and of clothing, of consumer protection in this field, and of the ready-to-wear and cleaning industries.
175. Apparel Design and Construction. (3) I and II. Miss McClelland  
Lecture and laboratory.  
Prerequisite: courses 6, 7.  
Wardrobe planning and problems in advanced clothing construction.
176. Dress Design and Fashion Analysis. (3) I and II. Mrs. Keane  
Lecture and laboratory.  
Prerequisite: course 7.  
The design, draping, and construction of costumes based on the principles of design and color theory; past and current fashion trends and fashion merchandising methods.

## SPECIAL STUDY COURSE APPLYING TO ALL MAJORS

199. Special Study for Advanced Undergraduates. (1 to 5) I and II.  
The Staff (Miss Coles in charge)

\* Not to be given, 1954-1955.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

202. Seminar in Foods and Nutrition. (2) I. Miss Okey
212. Seminar in Nutrition. (2) II. The Staff (Miss Okey in charge)
215. Seminar in Disorders of Nutrition. (2) I. Miss Gillum  
Prerequisite: course 115 or consent of instructor.
218. Research in Food and Nutrition. (2-6) I and II.  
The Staff (Miss Okey in charge)
222. Seminar in Institutional Organization and Management. (2) II.  
Prerequisite: courses 121, 122 or consent of instructor. Miss Gillum
- \*230. Seminar in Nutrition of Development. (2) II. ———  
Prerequisite: graduate standing in Nutrition.
232. Seminar in Psychology of Early Childhood. (2) II. Miss Landreth  
Prerequisite: graduate standing in Child Development or in Psychology.
237. Research in Family Sociology. (2 to 4) I and II. Mr. Landis  
Techniques of research and evaluation of research in family sociology.  
Opportunity to engage in individual or group research projects.
238. Research in Home Economics. (2-6) I and II.  
The Staff (Miss Coles in charge)
239. Seminar in Sociological Aspects of Marriage and Family Counseling.  
(2) II. Mr. Vincent  
Prerequisite: consent of instructor.  
A survey and critical analysis of the field of marriage and family counseling with primary emphasis upon social factors and sociological concepts, as differentiated from psychiatric and clinical concepts and levels of analysis.
242. Seminar in Family Economics. (2) II. Miss Coles
262. Seminar in Textiles. (2) II. Miss Jones  
Prerequisite: graduate standing in Textiles and Clothing.

**HORTICULTURE**

(GIVEN AT RIVERSIDE)

## GRADUATE COURSE

- 201A-201B. Research in Subtropical Horticulture. (1-6; 1-6) Yr. ———

**ITALIAN**

(Department Office, 4226 Dwinelle Hall)

Michele De Filippis, Ph.D., *Professor of Italian (Chairman of the Department)*.Giovanni Cecchetti, Dottore in Lettere, *Assistant Professor of Italian*.

\* Not to be given, 1954-1955.

Aldo Scaglione, Dottore in Lettere, *Assistant Professor of Italian*.  
Josephine P. Proskauer, *Dottore in Lettere, Associate in Italian*.

*Letters and Science List.*—All undergraduate courses in Italian are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. De Filippis.

*Preparation for the Major.*—Required: 16 units of lower division courses or four years of high school Italian, or other equivalent to be tested by examination. Recommended: a reading knowledge of Latin.

*The Major.*—24 units of upper division courses of which at least 18 must be in Italian; 6 units must be chosen from courses in French, Spanish, Portuguese, or Classics.

The department recommends as a supplementary choice among the free electives: (a) history of the country or countries most intimately connected with the major, (b) related courses in other literatures, (c) the history of philosophy, (d) German, (e) Latin, (f) Greek.

#### LOWER DIVISION COURSES

1. Elementary Italian. (4) I and II. Mr. Cecchetti and Assistants

2. Elementary Italian (continuation of 1). (4) I and II.  
Mr. Cecchetti and Assistants

Prerequisite: two years of high school Italian or course 1.

3. Intermediate Italian, Review Grammar, Composition, and Reading. (4) I and II. Mr. Cecchetti and Assistant

Prerequisite: three years of high school Italian or course 2.

4. Intermediate Italian (continuation of 3). (4) II. Mr. Cecchetti  
Prerequisite: course 3.

39A–39B. Italian Literature in English Translation. (3–3) Yr.  
Mr. De Filippis, Mr. Scaglione

A survey of the most important works in Italian literature (in English) from Dante to the present, with lectures in English and collateral reading of representative works in English translation.

#### SPECIAL LOWER DIVISION COURSE FOR GRADUATE STUDENTS

\*1G. Italian for Graduate Students. (No credit) I and II. Mr. De Filippis  
Preparation for graduate reading examinations.

#### UPPER DIVISION COURSES

Sixteen units of lower division courses in Italian are required for admission to any upper division course. Only those students who pronounce correctly and read fluently will be admitted to upper division courses. Students who transfer from other institutions may be tested by examination.

100. Survey of Modern Drama from Goldoni to the Present. (3) II.  
Mr. Cecchetti

101A–101B. Advanced Grammar, Composition, and Conversation. (3–3) Yr.  
Mr. Cecchetti

103A–103B. Survey of Italian Literature. (3–3) Yr. Mr. De Filippis  
A study of standard authors in prose and verse; lectures in Italian and reports on assigned themes.

\* Not to be given, 1954–1955.

- \*104A-104B. Italian Literature of the Nineteenth Century. (3-3) Yr.  
Mr. Cecchetti  
Reading of texts, with a special study of literary technique. Lectures in Italian.
105. Contemporary Italian Literature. (3) I. Mr. Cecchetti  
An historical and critical survey of all important movements and figures in Italian writing since 1910.
- 109A-109B. Dante's *Divina Commedia*. (3-3) Yr. Mr. Scaglione  
Prerequisite: 6 units of upper division work in Italian or equivalent.
- \*150A-150B. Dante's *Divine Comedy* in English Translation. (2-2) Yr.  
Mr. Scaglione  
Designed for upper division students wishing the cultural background provided by such a masterpiece as Dante's, and for graduate students whose major field is not in Romance languages. Enrollment is limited to students who have already completed some upper division work or who present other evidence of adequate preparation. No knowledge of Italian required. This course will not be accepted toward the major in Italian. Course 150A is prerequisite to 150B.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
Reading course with a short thesis. Mr. Cecchetti

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- \*201A-201B. Italian Philology. (2-2) Yr. \_\_\_\_\_
- \*206A-206B. Problems in Italian Grammar. (2-2) Yr. Mr. De Filippis  
A study of difficult points in grammar and syntax. Research and reports.
- 207A-207B. Problems in Italian Literature. Seminar. (2-2) Yr.  
Mr. De Filippis  
The period (Trecento or Quattrocento, etc.) or the special genre to be studied will vary; the purpose of the course is training in methods of literary research.
229. Special Study for Graduates. (1-4) I and II. Mr. De Filippis

## RELATED COURSE

The Renaissance in the Literatures of Italy, France and England (Comparative Literature 151A-151B).

## JOURNALISM

(Department Office, 5205 Dwinelle Hall)

Robert W. Desmond, Ph.D., *Professor of Journalism*.

Philip F. Griffin, M.A., *Associate Professor of Journalism (Chairman of the Department)*.

† Albert G. Pickerell, Ph.D., *Associate Professor of Journalism*.

Harold L. Nelson, M.A., *Acting Assistant Professor of Journalism*.

\* Not to be given, 1954-1955.

† Absent on leave, 1954-1955.



Marvin Rosenberg, Ph.D., *Assistant Professor of Journalism.*  
 Alfred E. Tomlinson, A.B., *Associate in Journalism.*



Charles M. Hulten, M.A., *Visiting Professor of Journalism.*  
 William W. Greer, B.S., *Lecturer in Journalism for the spring semester.*  
 Lloyd E. Reeve, *Lecturer in Journalism.*

\*George W. Seidl, A.B., *Lecturer in Journalism.*

*Letters and Science List.*—Courses 120A–120B, 140, 141, 190, 195, and 199 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Desmond, Mr. Griffin.

*Preparation for the Major.*—Required: History 4A–4B or History 17A–17B; Political Science 1 and 2; Economics 1A–1B; English 1A–1B or Speech 1A–1B. Recommended: course 38.

*The Major.*—Required: courses 120A–120B, 140, 141, and 9 additional units selected as follows: courses 131 and 184 and 3 additional units; or courses 152 and 153 and 3 additional units; or courses 170 and 171 and 3 additional units. Business Administration 160 and 163 may be included as part of the major requirement in Journalism.

In addition, all majors are required to select a concentration of 15 units or two concentrations of 9 and 6 units, in any other field or fields of study offered by other departments of the University. (By "field or fields of study" it is intended that the student shall select "related courses," not merely courses selected at random within a department.) These concentrations should be selected on the basis of the student's competence and special interest and must be approved by the Department. All courses in the concentrations must be from upper division offerings.

The Department reserves the right to restrict the student to not more than 24 units of upper division work in courses offered in the Department of Journalism.

Continuance in the major is contingent upon the student achieving at least a grade C average in courses taken in the major or required for the major.

*Higher Degree.*—For information concerning the requirements for the degree Master of Journalism consult the Dean of the Graduate Division or the Chairman of the Department of Journalism.

#### LOWER DIVISION COURSE

38. Mass Communication in the United States. (2) I. Mr. Desmond  
 Prerequisite: English 1A–1B or Speech 1A–1B or consent of instructor.

Lectures and critical writing in connection with the reading of important books and literature relating to the press, radio, and other media of information and opinion.

#### UPPER DIVISION COURSES

120A–120B. The News. (3–3) Yr. Mr. Griffin, Mr. Nelson

One two-hour and two one-hour section meetings per week.

Prerequisite: English 1A–1B or Speech 1A–1B. Sophomore students may be admitted to the course with consent of instructor.

120A. A comparative study of representative newspapers, emphasizing professional and social problems of news presentation.

120B. Problems of news treatment; writing and editing in experimental forms.

\* Absent on leave, 1954–1955.

131. The Editor and the Community. (3) I. Mr. Rosenberg, Mr. Tomlinson  
One lecture per week and two two-hour laboratory sections per week.  
Prerequisite: course 120A-120B.  
A study of the problems of newspaper content, news selection, and display, with special attention to investigation into newspaper audience reactions. A study based upon the student's observation of a selected community and the newspaper serving it will be required.
140. History of Journalism. (3) I. Mr. Griffin  
Study of the development of journalism, particularly in the United States, with an introduction to the important papers and personalities.
141. The Press and Society. (3) II. Mr. Desmond  
An examination of the press as an important institution in the nation and in the world.
150. Contemporary Editorial Problems. (3) II. Mr. Hulten  
Prerequisite: courses 120A-120B, 131, or consent of instructor.  
An examination of current problems, with practice in bibliographical and research methods, and writing in editorial and interpretative forms.
152. Magazine Article Writing. (3) I. Mr. Reeve  
Prerequisite: upper division standing and consent of instructor.  
Writing for magazines, specialized publications, and newspaper feature sections. Magazine publishing practices as they affect the professional writer.
153. Magazine Production and Writing. (3) II. Mr. Reeve  
Prerequisite: upper division standing and consent of instructor.  
Editing, organization, operation and economy of magazines and specialized publications. Advanced problems in magazine writing. Each student will prepare a study of a selected periodical.
170. Principles of Publishing. (3) II. Mr. Desmond  
Two lectures per week and one two-hour laboratory section.  
Analysis of the economy, organization, and operation of daily and weekly newspapers.
171. Newspaper Advertising. (3) II. Mr. Rosenberg  
Two lectures per week and one two-hour laboratory period.  
Analysis of advertising principles of the daily and weekly newspaper, with attention to typography, layout, copy writing, and production.
180. Radio News Writing. (3) II. Mr. Greer  
Lectures, discussion, and writing experience.  
Prerequisite: course 120A-120B. Class limited to eighteen students, with preference given to majors in journalism.  
Theory and practice of news writing for radio, and special-events reporting, with special attention to problems of auditory communication.
184. The News and Public Affairs. (3) II. Mr. Griffin  
Prerequisite: senior standing and consent of instructor.  
The reporting of public affairs, with emphasis on background and interpretive stories.
190. The Press and World Affairs. (3) I. Mr. Desmond  
Comparative world journalism, with an examination of sources of news from various capitals, and consideration of influences that affect information reaching the people about public affairs.

195. Critical Reviewing for the Press. (3) I. Mr. Rosenberg  
Prerequisite: senior standing and the consent of instructor.  
Theory and technique of reviewing current literature, drama, film, and the arts. The reviewer's function in sustaining standards of artistic excellence, guiding popular taste, and providing constructive criticism for working artists. Practice in writing reviews.
196. Theories and Problems in the Conduct of International Information Programs. (3) I. Mr. Hulten  
Prerequisite: senior or graduate standing and consent of instructor.  
A study of governmental efforts at international persuasion; problems of message content, and propaganda directed at the peoples of the world by various countries.
199. Special Study for Advanced Students. (1-4) I and II.  
The Staff (Mr. Desmond in charge)  
Prerequisite: for students whose major is journalism, at least a B average in all journalism courses undertaken, or consent of instructor; for others, at least a B average in all courses undertaken, and consent of instructor.

## GRADUATE COURSES

Prerequisite: courses 120A-120B and 140. Admission to all graduate courses is at the discretion of the instructor. See also page 10.

201. Research Methods in Journalism. (2) I and II. Mr. Rosenberg  
Materials and techniques of journalistic research. Study of bibliographical method, historical and sociological investigation, quantitative and qualitative analysis. Required of all candidates for the Master of Journalism degree.
- \*220. The Newspaper and Public Affairs. (3) II. Mr. Griffin  
A seminar requiring investigation in the theory and practice of the newspaper press in reporting public affairs, and in the interrelationships between public agencies and the press. With field work.
- \*231. The Newspaper and Its Audience. (3) I. Mr. Griffin  
A seminar in the development and performance of the newspaper press, with special reference to audience problems. With reports from students.
240. Seminar in History of Journalism. (3) II. Mr. Griffin
263. Public Opinion, Propaganda and the Mass Media. (3) II. Mr. Hulten  
Critical analysis of the place of the press, radio, films and television in shaping the public mind; effects on public opinion of practices in these media; propaganda and information techniques of governments, political parties, pressure groups, and other organized bodies.
265. The Law of Communications. (3) I. Mr. Hulten  
A seminar inquiring into contemporary legal controls affecting the press, radio and films, with special attention to issues of press freedom, contempt of court, the law of libel, and privilege. Case studies.
270. Economic Organization of the Press. (3) II. Mr. Desmond  
A seminar analyzing the business practices and financial structure of the newspaper press and its relationship to the community in which it operates. Case studies.

\* Not to be given, 1954-1955.

290. Seminar in Comparative World Journalism. (3) II. Mr. Desmond
299. Special Research Projects and Field Study in Communications. (1-4) I and II. The Staff (Mr. Griffin in charge)  
Individual investigation of a selected topic, conducted under guidance of a member of faculty. May be taken both semesters.

## LANDSCAPE ARCHITECTURE

(Department Office, 101 Agriculture Hall)

- <sup>1</sup> Harry W. Shepherd, B.S., *Professor of Landscape Architecture.*  
H. Leland Vaughan, B.S., *Professor of Landscape Architecture (Chairman of the Department).*  
John W. Gregg, B.S., D.L.A., *Professor of Landscape Architecture, Emeritus.*  
Roy B. Litton, Jr., M.L.A., *Assistant Professor of Landscape Architecture.*
- ◊
- Gordon Stephenson, A.B., M.C.P., *Visiting Professor of City and Regional Planning, Architecture, and Landscape Architecture.*  
Francis J. Violich, B.S., *Associate Professor of City and Regional Planning and Lecturer in Landscape Architecture.*

*Departmental Major Adviser: Mr. Vaughan.*

*Preparation for the Major.*—For courses required in preparation for the major see pages 84 and 88 of the CIRCULAR OF INFORMATION. For further information consult the PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

*The Major.*—Required: Landscape Architecture 49 plus a minimum of 30 units in landscape architecture selected with the approval of the major adviser. (Courses 1A, 1B, 101A, 101B, and 114A or 114B should be included.)

### LOWER DIVISION COURSES

- 1A-1B. Elementary Design and Theory. (3-3) Yr.  
Mr. Vaughan, Mr. Litton, ——  
1A: Mr. Vaughan, ——; 1B: Mr. Litton.  
Lecture and laboratory  
Prerequisite: Architecture 1, may be taken concurrently with consent of instructor.  
The analysis and solution of typical site problems.
2. History and Literature of Landscape Architecture. (2) I. Mr. Litton  
Study and analysis of landscape design through the ages with emphasis on its relation to climate, topography, and society in various times and localities.  
Limited to major students in landscape architecture.
49. Summer Travel and Observation Course. (No credit)  
The Staff (Mr. Vaughan in charge)  
Six weeks of field trips, study, and analysis of outstanding works in site planning and landscape design throughout central California.  
Limited to major students in landscape architecture.

### UPPER DIVISION COURSES

Art 2A-2B or Decorative Art 6A-6B, Botany 1 or 12, Architecture 1 and 2, Engineering 21, Landscape Architecture 1A-1B and 2, or their equivalent are prerequisite to all upper division courses in landscape architecture.

<sup>1</sup> In residence fall semester only, 1954-1955.

- \*100. Principles of Landscape Architecture. (3) I and II. Mr. Vaughan  
Prerequisite: Advanced standing in architecture, decorative art, or city planning.  
Introduction to the theory, materials, and methods of landscape design.  
Not open to majors in landscape architecture.
- 101A-101B. Intermediate Design and Theory. (3-3) Yr.  
101A: ———; 101B: Mr. Litton. ———, Mr. Litton  
Lecture and laboratory.  
Specific problems in the design of residential homesites, parks, and general public areas.
- 111A-111B. Landscape Design and Construction. (4-4) Yr.  
111A: Mr. Vaughan; 111B: ———. Mr. Vaughan, ———  
Lecture, laboratory, and field trips.  
Problems of design and construction with special reference to grading, retaining walls, steps, pools, garden structures, fences, irrigation, and drainage systems; reports and estimates.
- 112A-112B. Plant Materials and Planting Design. (3-3) Yr.  
Lecture, laboratory, and field trips. Mr. Shepherd, ———  
The form, habit, texture, and adaptation of coniferous, deciduous, and evergreen shrubs, broadleaf and coniferous trees.  
112A is not prerequisite to 112B.
- 113A-113B. Plant Materials and Planting Design. (3-3) Yr.  
Lecture, laboratory, and field trips. Mr. Shepherd, ———  
The form, habit, and adaptation of alpiners, succulents, palms, tropical plants, natives, vines, and deciduous trees.  
113A is not prerequisite to 113B.
- 114A-114B. Advanced Design and Theory. (4-4) Yr. Mr. Litton, ———  
114A: Mr. Litton; 114B: ———.  
Lecture and laboratory.  
Prerequisite: course 101A-101B.  
Specific problems of design and construction in large areas.
115. Park and Recreation Area Planning. (4) I.  
Lecture and laboratory. Mr. Violich, Mr. Stephenson  
Specific problems in design of public-use areas with particular emphasis on their relation to the city, state, or region as a whole.
116. Site Planning. (4) II. Mr. Stephenson, Mr. Violich  
Lecture, laboratory, and field trips.  
Prerequisite: junior standing in architecture or landscape architecture, or enrollment in a course in the Department of City and Regional Planning, and consent of instructor. Enrollment limited to laboratory facilities.  
A study of the development of irregular topography for building groups and their attendant outdoor elements.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Vaughan in charge)

## GRADUATE COURSE

- 201A-201B. Graduate Design and Theory. (1-6; 1-6) Yr.  
The Staff (Mr. Vaughan in charge)  
Advanced problems and research.

\* Not to be given, 1954-1955.

## LAW

(Department Office, 225 Law Building)

Barbara Nachtrieb Armstrong, A.B., J.D., Ph.D., LL.D., *A. F. and May T. Morrison Professor of Municipal Law.*

<sup>1</sup>Edward L. Barrett, Jr., B.S., LL.B., *Professor of Law.*

Albert A. Ehrenzweig, Dr. Jur., J.D., LL.M., J.S.D., *Professor of Law.*

Judson F. Falknor, B.S., LL.B., *Walter Perry Johnson Professor of Law.*

William Warren Ferrier, A.B., J.D., *Professor of Law.*

Richard W. Jennings, A.B., M.A., LL.B., *Professor of Law.*

Adrian A. Kragen, A.B., LL.B., *Shannon Cecil Turner Professor of Law.*

William T. Laube, Jr., A.B., J.D., LL.M., *Professor of Law.*

<sup>2</sup>Frank C. Newman, A.B., LL.B., LL.M., J.S.D., *Professor of Law.*

Covey T. Oliver, A.B., LL.B., LL.M., J.S.D., *Professor of Law.*

William Lloyd Prosser, A.B., LL.B., LL.D., *Elizabeth Josselyn Boalt Professor of Law (Chairman of the Department).*

Stefan A. Riesenfeld, B.S., LL.B., Dr. jur., Dott. in giur., S.J.D., *Emanuel S. Heller Professor of Law.*

Arthur H. Sherry, A.B., LL.B., *Professor of Law and Criminology.*

Alexander M. Kidd, A.B., LL.B., *Elizabeth Josselyn Boalt Professor of Law, Emeritus.*

James Patterson McBaine, LL.B., LL.D., *A. F. and May T. Morrison Professor of Municipal Law, Emeritus.*

Robert F. Brachtenbach, B.S., *Associate in Law.*

Herbert C. Harper, LL.B., *Associate in Law.*

Fred A. Schenk, J.D., *Associate in Law.*



Valentine Brookes, A.B., LL.B., *Lecturer in Law.*

John W. Cowee, B.S., M.B.A., Ph.D., *Associate Professor of Insurance.*

Orrin B. Evans, A.B., LL.B., S.J.D., *Visiting Professor of Law for the spring semester.*

Robert Cronley Harris, A.B., LL.B., *Lecturer in Law.*

Tevis Jacobs, A.B., J.D., *Lecturer in Law.*

Sam Kagel, A.B., LL.B., *Lecturer in Law.*

Joseph Chanslor Kimble, A.B., LL.B., *Lecturer in Law.*

William N. Keeler, A.B., J.D., *Lecturer in Law.*

Scott C. Lambert, LL.B., *Lecturer in Law.*

Dana Latham, A.B., LL.B., *Lecturer in Law.*

Theodore Robert Meyer, A.B., J.D., *Lecturer in Law.*

Walter S. Peake, A.B., LL.B., LL.M., *Lecturer in Law.*

Lloyd M. Robbins, Ph.D., D.C.L., *Lecturer and Consultant in Canon Law.*

Vernon M. Smith, A.B., LL.B., *Librarian of the Law Library and Lecturer in Law.*

Samuel Taylor, A.B., LL.B., *Lecturer in Law.*

### CURRICULUM OF THE SCHOOL OF LAW

For admission requirements and for the requirements for the degree of Master of Laws (LL.M.) and of Doctor of the Science of Law (J.S.D.) consult the ANNOUNCEMENT OF THE SCHOOL OF LAW.

<sup>1</sup> In residence fall semester only, 1954-1955.

<sup>2</sup> In residence spring semester only, 1954-1955.

Nonresidents of California enrolled as students in the School of Law pay a fee of \$192 each semester, which includes the incidental fee charged all students.

### PROFESSIONAL CURRICULUM

#### First Year

200A-200B. Contracts. (3-3) Yr.	Mr. Laube, Mr. Peake
202. Crimes. (3) I.	Mr. Sherry
206A-206B. Pleading and Procedure in Civil Cases. (3-3) Yr.	Mr. Falknor
208A-208B. Property. (3-3) Yr.	Mr. Ferrier
210. Equity. (3) II.	Mr. Evans
212A-212B. Torts. (3-3) Yr.	Mr. Prosser
214A-214B. Introduction to Law. No credit. Yr.	
Committee on Introduction to Law (Mr. Falknor, Chairman)	

#### Second Year

220. Administrative Law: First Course. (3) II.	Mr. Newman
222A-222B. Business Associations. (3-3) Yr.	Mr. Jennings
224A-224B. Constitutional Law. (2-2) Yr.	Mr. Barrett, Mr. Oliver
226. Wills (2) I.	Mr. Ferrier
228. Legal Accounting. (2) I.	Mr. Peake
230. Marital Property. (2) I.	Mrs. Armstrong
232. Security Transactions. (2) I.	Mr. Riesenfeld
236. Trusts. (2) II.	Mr. Evans
237. Income Taxation. (3) II.	Mr. Kragen

#### Third Year

*240. Administrative Law: Second Course. (2) II.	Mr. Newman
242. Admiralty. (2) II.	Mr. Riesenfeld
243A-243B. Commercial Transactions. (2-2) Yr.	Mr. Laube
244. Creditors' Remedies. (3) I.	Mr. Riesenfeld
245. Comparative Jurisprudence. (2) I.	Mr. Ehrenzweig
246. Conflict of Laws. (3) II.	Mr. Ehrenzweig
247. Corporation Finance. (2) I.	Mr. Jennings
248. Selected Problems in Corporations and Partnership. (2) II.	Mr. Jennings
250A-250B. Evidence. (2-2) Yr.	Mr. Falknor
251. Selected Problems in Comparative Jurisprudence. (2) II.	Mr. Ehrenzweig

\* Not to be given, 1954-1955.

253. Family Law. (2) II. Mrs. Armstrong
254. Federal Jurisdiction. (2) I. Mr. Barrett
256. Future Interests. (2) II. Mr. Ferrier
257. Insurance. (2) I. Mr. Ehrenzweig, Mr. Cowee
258. International Law. (2) I. Mr. Oliver
262. Labor Law: First Course. (2) I. Mrs. Armstrong, Mr. Kagel
264. Labor Law: Second Course. (2) II. Mrs. Armstrong
265. Advanced Legal Writing. (1-2) I and II. Mr. Prosser
266. Legislation. (2) II. Mr. Newman
268. State and Local Government Law. (2) II. Mr. Kragen, Mr. Sherry
270. Government Control of Business. (2) II. Mr. Riesenfeld
274. Restitution. (2) II. Mr. Peake
276. Restraint of Trade and Unfair Competition. (3) I. Mr. Kragen
- \*278. Selected Problems in Criminal Law and Administration. (2) I.  
Mr. Sherry
282. Estate and Gift Taxation. (2) I. Mr. Oliver
283. Selected Problems in Estate and Tax Planning. (2) II. Mr. Oliver
284. Selected Problems in Taxation of Business Enterprise. (2) I.  
Mr. Kragen

#### Graduate Curriculum

- 285A-285B. Seminar in Administrative Law and Procedure. (2-2) Yr.  
Mr. Newman
- 286A-286B. Seminar in Business Organizations. (2-2) Yr. Mr. Jennings
- 287A-287B. Seminar in Commercial Transactions. (2-2) Yr.  
Mr. Laube, Mr. Prosser, Mr. Riesenfeld
- 288A-288B. Seminar in Constitutional Law. (2-2) Yr. Mr. Barrett
- 289A-289B. Seminar in Criminal Law and Procedure. (2-2) Yr. Mr. Sherry
- 290A-290B. Seminar in International and Maritime Law. (2-2) Yr.  
Mr. Oliver, Mr. Riesenfeld
- 291A-291B. Seminar in Labor Law and Procedure. (2-2) Yr.  
Mrs. Armstrong, Mr. Kagel, Mr. Riesenfeld
292. Seminar in Legal Education. (1) I and II.  
The Staff (Mr. Newman in charge)
- 293A-293B. Seminar in Legal History and Jurisprudence. (2-2) Yr.  
Mr. Ehrenzweig, Mr. Riesenfeld
- 294A-294B. Seminar in Legislation and Legislative Procedure. (2-2) Yr.  
Mr. Newman, Mr. Smith

\* Not to be given, 1954-1955.



- 295A-295B. Seminar in Practice and Procedure. (2-2) Yr.  
Mr. Falknor, Mr. Kragen
- 296A-296B. Seminar in Property and Trust Administration. (2-2) Yr.  
Mr. Ferrier, Mr. Oliver
- 297A-297B. Seminar in Public Finance and Taxation. (2-2) Yr.  
Mr. Kragen, Mr. Oliver
- 298A-298B. Seminar in Roman and Comparative Law. (2-2) Yr.  
Mr. Ehrenzweig, Mr. Riesenfeld
299. Research in Legal Problems. (1-5) I and II.  
The Staff (Mr. Oliver in charge)

## LIBRARIANSHIP

(Department Office, 425 Library)

- Donald Coney, M.A., *Professor of Librarianship.*
- J. Periam Danton, Ph.D., *Professor of Librarianship (Chairman of the Department).*
- LeRoy C. Merritt, Ph.D., *Professor of Librarianship (Vice-Chairman of the Department).*
- Edward A. Wight, Ph.D., *Professor of Librarianship.*
- Edith M. Coulter, M.A., B.L.S., *Professor of Librarianship, Emeritus.*
- Della J. Sisler, M.A., B.L.S., *Associate Professor of Librarianship, Emeritus.*
- Anne Ethelyn Markley, M.A., *Associate Professor of Librarianship.*
- Fredric John Mosher, Ph.D., *Associate Professor of Librarianship.*
- Louis D. Sass, Ph.D., *Assistant Professor of Librarianship.*



- Jessie E. Boyd, M.A., Cert. in Libr., *Lecturer in School Library Administration for the spring semester.*
- Leone F. Garvey, M.A., *Lecturer in Librarianship for the spring semester.*
- Melvin J. Voigt, M.L.S., *Lecturer in Librarianship.*

The School of Librarianship is organized to offer a two-year curriculum. On completion of the first year with an average grade of at least C plus (1.5 grade-point average) for the full work of each semester, the Bachelor of Library Science (B.L.S.) degree is awarded. The degree of Master of Library Science is granted to students who complete with an average grade of at least B the second-year curriculum. Candidates for this degree are subject to all general University regulations governing it (see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION).

Applicants for admission to either curriculum should send to the Dean of the School transcripts of their academic records in order that their qualifications for admission to the School may be determined. Graduate standing, without deficiencies, in the University of California, which is determined by the Dean of the Graduate Division, is required for admission. (For regulations concerning such status see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.)

### Program for the Degree of Bachelor of Library Science

To secure adequate opportunity for those who enroll in the School, only a limited number will be accepted for the first-year curriculum. No one should come to Berkeley without previously having made application to the School

and having received notice of acceptance. Early application is desirable. Selection is based primarily on scholarship. New first-year students will not be admitted at the opening of the spring semester.

The work is organized as a professional curriculum and particular subjects may not, as a rule, be taken separately. The courses are planned to occupy a student's entire time and only the exceptional or previously experienced should expect to do any outside work.

*Preliminary Preparation.*—A good general education is the best basis for librarianship. The Dean of the School will be glad to give advice in reference to undergraduate courses. Two modern languages (not less than 8 college semester units of each) are required for admission. German and French are particularly recommended. Ability to use the typewriter with accuracy and a fair degree of speed is expected of all students. Experience in library work is highly desirable but is not required for admission.

Applicants are required to take the Aptitude Test of the Graduate Record Examination and should do so, if possible, not later than the spring of the year of application.

Applications from those who obtain less than a 1.5 grade-point average in their last two years of college or university work cannot be considered.

Applications from those over thirty-five years of age will be considered only when the applicants hold responsible library positions from which they can obtain leaves of absence. Exceptions to this rule may be considered only under unusual circumstances, such as applicants having a doctor's degree.

*State Credential for School Librarians.*—The California State Department of Education accepts the completion of the first year's work in satisfaction of its technical requirements for the special credential in librarianship, but candidates for it must also do directed practice work in school libraries during the second semester. Students undertaking this work register and receive credit for Education 323, 4 units. To meet additional requirements of the State Department of Education for this credential, candidates should take the following courses before enrollment in the School, or after the completion of the first year's work: secondary education, educational psychology, and junior high school education, elementary education, or reading and literature in the elementary school (totaling at least 9 units).

#### PROFESSIONAL COURSES

In 1954-1955, courses in librarianship will be offered in summer sessions, and in the fall and spring semesters. Students may begin the first-year curriculum only with the fall semester or summer sessions. The second-year curriculum may be commenced in either the fall or spring semesters, and electives may be taken in summer sessions or in any semester.

#### *First-Year Curriculum*

The 24-unit program of each student must include the following basic courses: 201, 202, 203, 204; the remaining units are to be elected from other courses in the first-year curriculum and may include upper division or graduate courses in appropriate subjects approved by the Dean of the School of Librarianship. Students who fail to make at least a C plus (1.5 grade-point average) in the first semester will not be permitted to enroll in the second semester.

201. Introductory Classification and Cataloguing. (4) I. Miss Markley  
Introduction to library classification with application of Dewey decimal system and brief comparison with Library of Congress system; functions of the catalogue; principles of catalogue entry based on American Library Association catalogue rules; methods of descriptive cataloguing based on modification of Library of Congress rules; introduction to sub-

ject cataloguing based on Sears, and Library of Congress lists of subject headings. Emphasis is placed upon acquiring familiarity with literature and tools of cataloguing.

202. *Bibliography and Reference Materials.* (3) I. Mr. Mosher, Mr. Sass  
Lectures, discussions, and reports on assigned problems.  
Basic reference materials including national and subject bibliography.
203. *Introduction to Librarianship.* (3) I. Mr. Danton, Mr. Wight  
Orientation of the new student in the profession of librarianship. Introductory survey of the evolution of modern libraries and basic information about the principal fields of library service, with emphasis on major trends and problems. Readings and written reports.
204. *Communication: History, Institutions, Media.* (2) I. Mr. Merritt  
Conspectus of the development of communication from the growth of language through the pictograph, the codex, the book, radio, motion picture, microfilm, and all other media for the recording and transmission of knowledge in the modern world. Development of institutions which use these media, with special emphasis on the growth and place of libraries in the whole structure.
205. *Selection and Acquisition of Library Materials.* (2) II. Mr. Merritt  
Theories, principles, and practice of selecting books and other library materials. Techniques of acquisition by public, school, and academic libraries.
206. *School Library Administration.* (2) II. Miss Boyd  
A general survey of elementary and secondary school libraries. Emphasis on the function, administration, organization, services, materials, and the planning and equipment of school libraries in relation to the modern school. Lectures, committee and individual reports, readings, class discussions, and field trips. Experiences gained in practice work are utilized.
207. *Municipal and County Library Administration.* (2) II. Mr. Wight  
Government, organization, and administration of municipal, county, and regional public libraries. Library service programs in relation to varying community patterns. Lectures, readings, reports, field trips.
208. *College and University Library Administration.* (2) II. Mr. Danton  
A general introduction to the organization and administration of college and university libraries and their place in the institutions of which they are a part. Problems and practices with respect to the library's government, functions, staff, collections, finances, and building are considered by means of written assignments, readings, and class discussion.
209. *Library Work with Children.* (2) II. Miss Garvey  
Lectures and discussion.  
A general survey of children's books and reading preferences. Historical backgrounds and development; types of children's literature; levels of interest; criticism and evaluation; illustration; trends; book selection; storytelling; organization and administration of a children's room in a public library.
211. *Development of the Book.* (2) II. Mr. Mosher  
Prerequisite: consent of instructor.  
Materials and techniques of book production. Early records and the manuscript period. Development of paper, type, and binding. Letterpress, offset, rotogravure, and other methods of printing. Modern developments in recording on disks, film, and wire.

212. Reference and Government Publications. (4) II. Mr. Mosher, Mr. Sass  
A continuation of course 202. Sources of information in subject fields. Emphasis is placed on types of information in foreign, national, state, and municipal documents. Problems in informational service.
214. Special Problems in Classification and Cataloguing. (2) II.  
Prerequisite: course 201 or equivalent. Miss Markley  
Cataloguing and classification of library materials requiring special description and analysis; practice in the use of Library of Congress classification and subject headings; arrangement of the catalogue; administration of the cataloguing department.
215. Reading and Reading Interests. (2) II. Mr. Merritt  
Reading interests, habits, and needs of different types and groups of readers. The nature of reading; problems of reading; selection of reading by children, college students, and public library patrons. The role of the library in adult education.
217. Bibliography of Science and Technology. (2) II. Mr. Voigt  
Prerequisite: basic college courses in chemistry and physics.  
Scientific and technical literature with emphasis on reference and bibliographical aids. Periodical and serial literature and its use and control through abstracts and indexes.

#### Program for the Degree of Master of Library Science

Candidates for the master's degree must be accepted in graduate standing, without deficiencies, in the University of California, must have completed with a grade of at least B the first-year curriculum in a graduate—Type I or II—library school, accredited by the American Library Association and approved by the University of California, must have not less than 8 units each of two modern foreign languages, and must take the Graduate Record Examination Aptitude Test. Professional library experience before undertaking advanced work is recommended.

Candidates for the master's degree must take 24 units of upper division and graduate courses. Twelve of these must be selected from the second-year curriculum of the School of Librarianship. The remaining 12 units may be selected from this same curriculum or from second-semester first-year courses not previously taken, or from upper division or graduate courses in subjects related to the particular interest of the student. In every case the program is subject to the approval of the Dean. Comprehensive final examinations and completion of a special study course are required of every candidate. An average grade of at least B must be maintained during the period in which the work for the master's degree is taken. Students must complete their work for the degree within five years from the date of first enrollment.

Any course in the second-year curriculum is open to any graduate student who satisfies the instructor of his ability and preparation to undertake the work, even though he is not a candidate for a master's degree in this school and does not qualify for it.

218. Advanced Cataloguing. (2) II. Miss Markley  
Modern trends and problems in cataloguing with emphasis on coöperative cataloguing, cataloguing policies, and the handling of unusual types of material; study of the theory of subject cataloguing; discussion and reports.
219. Advanced Classification. (2) I. Miss Markley  
History and theory of classification; comparative study of library classification systems leading, in the latter half of the semester, to intensive study and use of the Library of Congress system; individual problem or paper.

- \*220A-220B. Bibliography. (2-2) Yr. Miss Markley  
 Prerequisite: courses 202 and 212 or equivalent.  
 Methods and materials of bibliographical investigation. Location and description of books and manuscripts in special collections in America. Problems and reports.
- \*221. Book Collecting for University Libraries. (2) I. Mr. Merritt  
 Prerequisite: courses 205, 208.  
 Problems connected with the acquisition, development, and maintenance of the book, periodical, and other collections of university libraries. Required of all master's degree candidates who intend to specialize in the college and university library field.
225. History of Libraries. (2) I and II. Mr. Sass  
 Growth and development of the library as an institution in ancient, medieval, and modern civilization. The effect of political and social changes on the migration of manuscripts and books. Reports and papers.
226. History of Printing. (2) I. Mr. Mosher  
 Prerequisite: course 211 or equivalent.  
 Intensive study in selected phases of the history of printing; seminar discussion and individual projects of a bibliographical, historical, or book production nature.
228. Problems in Reading. (2) I. Mr. Merritt  
 Prerequisite: course 215.  
 Analysis of reading of college students and the general adult population in terms of characteristics and interests of readers, distribution and content of publications, methods of stimulating reading, and the effects of reading; the library and adult education.
230. Library Administration. (2) I. Mr. Wight  
 The basic advanced course in the principles and practice of library administration. Analysis of the organization and management of modern libraries of various types. Prerequisite to courses 232, 233, 234.
232. University Library Administration. (2) II. Mr. Coney  
 Prerequisite: courses 208, 230.  
 Study of current issues in personnel, finance, service, and the organization of materials and work. Individual projects, work periods, consultation, reports, and class discussion. Required of all master's degree candidates who intend to specialize in the college and university library field.
233. Junior College Library Administration. (2) II. Mr. Merritt  
 Prerequisite: course 230.  
 Problems and practices of secondary school libraries, with emphasis on the collections and instructional program of the junior college library.
234. Problems in Public Library Administration. (2) II. Mr. Wight  
 Prerequisite: courses 207, 230.  
 Detailed application of the principles of public administration to the management and operation of public libraries. Case study approach through critical analysis of the functions and problems of selected libraries. Assignments adapted to special interests of students. Required of all master's degree candidates who intend to specialize in the public library field.

\* Not to be given, 1954-1955.

238. Library in the Community. (2) I. Mr. Wight  
 Analysis of the community for the librarian. Social backgrounds, economic and educational levels, and community groups, as they affect library use. Methods of integrating the library with the community.
- \*240. Content Analysis. (2) II. Mr. Merritt  
 Problems in methods of determining maturity level, social and moral attitudes, and other educational and propagandistic assumptions in books, magazines, and other library materials.
251. Methods of Research in Librarianship. (2) I and II.  
 Mr. Mosher, Mr. Sass, Mr. Wight  
 History and function of research in contemporary society. Values and meaning of research. Techniques of bibliographical, historical, and sociological research, and their implications for the definition and investigation of library problems. Required of all candidates for the master's degree.
299. Special Study. (1-8) I and II.  
 Mr. Danton (in charge), Mr. Coney, Miss Markley,  
 Mr. Merritt, Mr. Mosher, Mr. Sass, Mr. Wight  
 Individual direction of student's choice, planning and writing of master's essay. May be elected either semester.

## LINGUISTICS

(Department Office, 4210 Dwinelle Hall)

- C. Douglas Chrétien, Ph.D., *Professor of Linguistics and Speech.*  
 Murray B. Emeneau, Ph.D., *Professor of General Linguistics and Sanskrit*  
 (*Chairman of the Department of Linguistics*).  
 Mary R. Haas, Ph.D., *Associate Professor of Linguistics and Siamese.*



- †Yuen Ren Chao, Ph.D., Litt.D., *Agassiz Professor of Oriental Languages and Literature.*  
 Yakov Malkiel, Ph.D., *Professor of Romance Philology.*  
 Madison S. Beeler, Ph.D., *Associate Professor of German.*  
 Denzel R. Carr, Ph.D., *Associate Professor of Oriental Languages.*  
 Oleg A. Maslenikov, Ph.D., *Associate Professor of Slavic Languages and Literatures.*  
 Francis J. Whitfield, Ph.D., *Associate Professor of Slavic Languages and Literatures.*  
 David W. Reed, Ph.D., *Assistant Professor of English.*

*Letters and Science List.*—All undergraduate courses in Linguistics are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

The degrees of Master of Arts and Doctor of Philosophy will be conferred upon qualified graduate students who complete the requirements, for which prospective candidates should consult the Chairman of the Department or the Dean of the Graduate Division. Basic requirements looking toward these degrees include a major in a language department or a combination of language courses.

Courses in specific languages are offered by the departments of Classics (Greek, Latin, Sanskrit), English (Old and Middle English, Celtic), French, German (including Old and Middle High German, Gothic, Old Saxon, Old

\* Not to be given, 1954-1955.

† Absent on leave, 1954-1955.

Icelandic, Dutch), Italian, Near Eastern Languages (Hebrew, Arabic, Syriac, Assyrian, Sumerian, Egyptian, Coptic), Oriental Languages (Chinese, Japanese, Korean, Indonesian and Malayo-Polynesian, Mongolian, Tibetan, Siamese), Romance Philology (Late Latin, Provençal), Scandinavian Languages (Swedish, Norwegian, Danish), Slavic Languages (Russian, Polish, Serbo-Croatian, Czech, Old Church Slavic, Early Russian), and Spanish and Portuguese. See also list of Related Courses in Other Departments, page 224.

## UPPER DIVISION COURSES

100. Introduction to General Linguistics. (3) II. Mr. Chrétien  
The principles and techniques of descriptive and comparative grammar.
130. Phonetics and Phonemics. (2) I. Miss Haas  
Two lectures and one hour of section work per week.  
Open to qualified language students and students of anthropology.
140. Linguistic Analysis. (3) II. Mr. Emeneau  
Prerequisite: course 130, or equivalent course in phonetics and phonemics.  
Lectures and practice in analysis of morphology and syntax.
145. Types of Linguistic Structure. (2) II. Miss Haas  
A rapid general survey followed by a more detailed presentation of selected Far Eastern and American Indian languages. Open to qualified language students and students of anthropology who have had course 130 or equivalent.
150. Introduction to Indo-European Comparative Grammar. (3) I. Mr. Emeneau  
Prerequisite: a fair knowledge of at least one of the older Indo-European languages (e.g., Latin) and one of the modern Indo-European languages other than English or a Romance language.
170. American Indian Languages. (2) II. Miss Haas  
A brief survey of the native languages of North America; grammatical structure of selected languages; the application of the comparative method to American Indian languages.
199. Special Study for Advanced Undergraduate. (1-5) I and II. The Staff

## GRADUATE COURSES

200. Pro-Seminar. (2) I. Mr. Chrétien  
Introduction to research.
- †207. Statistical Linguistics. (2) I and II. Mr. Chrétien
- 220A-220B. Linguistics Laboratory. (2-2) Yr. Miss Haas  
(Formerly numbered 190A-190B.)  
The technique of recording and analyzing a foreign language by working directly with a native speaker. Open to qualified language students and students of anthropology who have had course 130 and either 140 or 145. May be repeated without duplication of credit with consent of instructor.
- †230. Seminar in Descriptive Linguistics. (2) I and II. The Staff  
May be repeated with consent of instructor.
- †250. Seminar in Historical Linguistics. (2) I and II. The Staff  
May be repeated with consent of instructor.
- †270. Problems in Pacific Linguistics. (2) I and II. Mr. Chrétien

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

298. Special Study. (1-5) I and II.

The Staff

299. Directed Research. (1-5) I and II.

The Staff

## RELATED COURSES IN OTHER DEPARTMENTS

Language and Culture (Anthropology 120, Mr. Rowe).

Language (English 25, Mr. Reed).

Modern English (English 211J, Mr. Reed).

Germanic Linguistics (German 260, Mr. Beeler).

Comparative Grammar of Greek and Latin (Greek 139A-139B, Mr. Helmbold).

Linguistic History of the Roman Empire (Romance Philology 200, Mr. Malkiel).

Late Latin Language and Literature (Romance Philology 201, Mr. Malkiel).

General Romance Linguistics (Romance Philology 202, Mr. Malkiel).

Comparative Romance Phonetics (Romance Philology 204, Mr. Carmody).

Linguistic Geography Applied to Romance Dialectology (Romance Philology 205, Mr. Malkiel).

Comparative Slavic Linguistics (Slavic Languages 220, Mr. Whitfield).

General Phonetics (Speech 103, Mr. Chrétien).

## MATHEMATICS

(Department Office, 5319 Dwinelle Hall)

<sup>a</sup>Alfred L. Foster, Ph.D., *Professor of Mathematics.*John L. Kelley, Ph.D., *Professor of Mathematics (Vice-Chairman of Department).*Erich L. Lehmann, Ph.D., *Professor of Mathematics.*Derrick H. Lehmer, Ph.D., *Professor of Mathematics (Chairman of the Department).*Hans Lewy, Ph.D., *Professor of Mathematics.*<sup>\*</sup>Michel Loève, Docteur ès Sciences, *Professor of Mathematics.*Sophia Levy McDonald, Ph.D., *Professor of Mathematics.*<sup>\*</sup>Charles B. Morrey, Jr., Ph.D., *Professor of Mathematics.*Anthony P. Morse, Ph.D., *Professor of Mathematics.*Jerzy Neyman, Ph.D., *Professor of Mathematics and Director of the Statistical Laboratory.*Raphael M. Robinson, Ph.D., *Professor of Mathematics.*Henry Scheffé, Ph.D., *Professor of Statistics and Assistant Director of the Statistical Laboratory.*Alfred Tarski, Ph.D., *Professor of Mathematics.*Frantisek Wolf, Ph.D., *Professor of Mathematics.*Benjamin A. Bernstein, Ph.D., *Professor of Mathematics, Emeritus.*Thomas Buck, Ph.D., *Professor of Mathematics, Emeritus.*Griffith C. Evans, Ph.D., *Professor of Mathematics, Emeritus.*Charles A. Noble, Ph.D., *Professor of Mathematics, Emeritus.*Raymond H. Sciobereti, Ph.D., *Associate Professor of Mathematics, Emeritus.*Pauline Sperry, Ph.D., *Associate Professor of Mathematics, Emeritus.*Lee H. Swinford, Ph.D., *Assistant Professor of Mathematics, Emeritus.*Arthur R. Williams, Ph.D., *Assistant Professor of Mathematics, Emeritus.*<sup>a</sup> Absent on leave, 1954-1955.<sup>\*</sup> In residence spring semester only, 1954-1955.



- \*Edward W. Barankin, Ph.D., *Associate Professor of Mathematics.*  
 \*Leon A. Henkin, Ph.D., *Associate Professor of Mathematics.*  
 Joseph L. Hodges, Jr., Ph.D., *Associate Professor of Mathematics.*  
 Edmund Pinney, Ph.D., *Associate Professor of Mathematics.*  
 Murray Harold Protter, Ph.D., *Associate Professor of Mathematics.*  
 Abraham Seidenberg, Ph.D., *Associate Professor of Mathematics.*  
 Paul L. Chambré, Ph.D., *Assistant Professor of Mathematics.*  
 Stephen P. Diliberto, Ph.D., *Assistant Professor of Mathematics.*  
 Evelyn A. Fix, Ph.D., *Assistant Professor of Mathematics.*  
 Harley Flanders, Ph.D., *Assistant Professor of Mathematics.*  
 Terry A. Jeeves, Ph.D., *Assistant Professor of Mathematics.*  
<sup>1</sup>Tosio Kato, Ph.D., *Acting Assistant Professor of Mathematics.*  
 Charles H. Kraft, Ph.D., *Acting Assistant Professor of Mathematics.*  
 Ralph M. Lakness, Ph.D., *Assistant Professor of Mathematics.*  
 Lucien M. LeCam, Ph.D., *Assistant Professor of Mathematics.*  
 \*Elizabeth L. Scott, Ph.D., *Assistant Professor of Mathematics.*  
 Bernard Sherman, Ph.D., *Acting Assistant Professor of Mathematics.*  
 Errett A. Bishop, M.S., *Acting Instructor in Mathematics.*  
 Marvin P. Epstein, Ph.D., *Instructor in Mathematics.*  
 Howard A. Osborn, Ph.D., *Instructor in Mathematics.*  
<sup>1</sup>Marvin Rosenblum, M.A., *Acting Instructor in Mathematics.*  
 J. Paul Roth, Ph.D., *Instructor in Mathematics.*  
<sup>2</sup>Howard G. Tucker, M.A., *Associate in Mathematics.*



- Andrew Acrivos, Ph.D., *Instructor in Chemical Engineering.*  
 A. S. Besicovitch, F.R.S., *Visiting Professor of Mathematics for the spring semester.*  
 David Blackwell, Ph.D., *Visiting Professor of Mathematics.*  
<sup>2</sup>Charles Loewner, Ph.D., *Visiting Professor of Mathematics.*  
 Hendrick S. Konijn, M.A., *Lecturer in Agricultural Economics.*  
 Joseph Putter, Ph.D., *Lecturer in Mathematics for the fall semester.*  
 Norman E. Steenrod, Ph.D., *Visiting Professor of Mathematics for the spring semester.*  
 Jan van der Corput, Ph.D., *Visiting Professor of Mathematics.*

*Letters and Science List.*—All undergraduate courses in mathematics except courses 7, 107, 142A, 142B, 142C, 142D, 144 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Flanders, fall semester; Mr. Foster, spring semester; Mr. Lehmann (*Statistics*).

#### THE MAJOR IN MATHEMATICS

*Preparation for the Major in Mathematics.*—*Advisers:* Mr. Flanders, fall semester; Mr. Foster, spring semester.

Before taking the upper division courses for the major, the student is required to have a basis of knowledge equivalent to courses C, G, 8, 9, 3A–3B, 4A–4B. It is desirable, therefore, that he should have completed in high school two years of algebra, plane and solid geometry, and trigonometry, in order to anticipate as much of this work as possible.

*The Major in Mathematics.*—In the 24 units of upper division work required for the major in mathematics, the student is supposed to acquire com-

\* Absent on leave, 1954–1955.

<sup>1</sup> In residence fall semester only, 1954–1955.

<sup>2</sup> In residence spring semester only, 1954–1955.

petence in algebra, analysis, and geometry. The courses designed for this purpose are 111A-111B, 112A-112B, 119A-119B, in each of which at least 3 units should be taken. Courses 150A-150B, 185, or 201A-201B form a desirable part of the major program. The attention of those who are interested in logic is directed to Philosophy 12A-12B, as well as to Mathematics 109A-109B and 127A-127B. Courses in number theory, 115A-115B, and numerical analysis, 128A-128B (relating to large-scale digital computers), are also available.

The attention of the student is directed to the possibility of making group majors with other departments. Such majors will be welcomed not only with the departments of the physical sciences, but also with some of the social sciences and philosophy. Interested students should consult with the major adviser as early as possible.

Subject to the requirement of competence in the major, and with the approval of the adviser, the student is at liberty to take theoretical courses in physics, astronomy, or other sciences as part of his major in mathematics or mathematical statistics, as well as other upper division courses in mathematics. Course 201A-201B forms a desirable part of the program for senior students with facility for mathematics. Courses listed under Statistics may of course be used as part of the mathematics major. Special attention is directed also to the course in analytic mechanics, Physics 105A-105B. Students preparing for the Civil Service Examination in statistics should take course 132.

#### THE MAJOR IN MATHEMATICAL STATISTICS

*Preparation for the Major in Mathematical Statistics.*—Before undertaking the upper division program in statistics, the student should take course 12 and acquire a thorough knowledge of elementary calculus and algebra, with an emphasis on the conceptual side of the material offered. The recommended sequence of courses includes 3A, 3H, and 8 in the freshman year and 4G, 4H, and 12 in the sophomore year. When selecting the non-mathematical courses, the student should consider a suitable field of application of mathematical statistics such as astronomy, biological sciences, economics, physics, psychology or public health.

*The Major in Mathematical Statistics.*—In the 24-unit major the student should acquire substantial knowledge of statistics and probability, combined with a background in the theory of functions of real and of complex variables. To this end, the program should include courses 113, 120A, and at least 3 units in courses 120B, 132, 166. It is recommended that 120A, 120B be combined with 120C, 120D. In addition, the student should select any three of the courses 109, 111, 119, 150 and 185 and take at least three units in each.

Those contemplating graduate studies leading to higher degrees in statistics should make an effort to include in the major the undergraduate courses which are prerequisite to the graduate ones.

Attention of the student is drawn to the possibility of a group major in Statistics combined with an empirical science. This major includes courses 130A, 130B, 130C, 130D, and 132.

*School of Business Administration.*—Course 2, mathematics of finance and business, is a prerequisite for students in the School of Business Administration. As an alternative, however, course 16A-16B, analytic geometry and calculus, or course 3A-3B, plane analytic geometry and calculus, may be substituted, if students wish to continue with advanced mathematics.

#### LOWER DIVISION COURSES

C. Trigonometry. (3) I and II.

Mr. Osborn and the Staff

Prerequisite: plane geometry; one and one-half years of high school algebra or course D.

Course C includes plane trigonometry and spherical right triangles.

- D. Intermediate Algebra. (3) I and II. Mr. Roth and the Staff  
 Prerequisite: one year of high school algebra. One and one-half years of high school algebra is advised. Not open to students who have received credit for two years of high school algebra, or course 3A or 8.
- G. Solid Geometry. (2) I and II. \_\_\_\_\_
1. College Algebra. (3) I and II. Mr. Epstein and the Staff  
 Review and practice in general ideas and applications of algebra and trigonometry.  
 Open only to students who have had the prerequisite for course 3A, who have taken the qualifying examination for that course, and who are then permitted by the Department to enroll in course 1. Students who show little or no knowledge of algebra will not be allowed to enroll.
2. Mathematics of Finance and Business. (3) I and II. \_\_\_\_\_ and the Staff  
 Prerequisite: two years of high school algebra or course D. Prescribed in the School of Business Administration. Not open to students who have completed or are taking Engineering 120.
- 3A. Analytic Geometry and Calculus, First Course. (3) I and II. Mr. Sherman and the Staff  
 Prerequisite: two years of high school algebra or course D (passed with a grade of C or better), plane geometry, plane trigonometry.  
 All prospective registrants in Mathematics 3A, except those who have passed Mathematics D (with grade C or better) or Mathematics I in regular session at Berkeley the semester prior to registering in 3A, must take the qualifying examination which is given on Tuesday of registration week of each regular session.  
 Elements of differential calculus and analytic geometry.
- 3B. Analytic Geometry and Calculus, Second Course. (3) I and II. Mr. Pinney and the Staff  
 Prerequisite: courses 3A or 11A-11B, or 16A-16B.  
 Continuation of 3A. Analytic geometry, differential and integral calculus.  
 A special section is arranged for students who have taken a semester course of analytic geometry without calculus.
- 3H. Analytic Geometry and Calculus, Second Course. (3) I and II. Mr. Osborn  
 Prerequisite: course 3A with high attainment; admission on recommendation of the department.  
 Course substantially the same as 3B, but designed for students with special facility for mathematics.
3. Analytic Geometry and Calculus, First and Second Courses. (6) I and II. Mr. Bishop and the Staff  
 Prerequisite: same as for 3A including the qualifying examination, passed with higher attainment.
- 4A. Analytic Geometry and Calculus, Third Course. (3) I and II. Mr. Protter and the Staff  
 Prerequisite: course 3B.  
 Continuation of 3B. Thorough technique of differential and integral calculus.
- 4G. Analytic Geometry and Calculus, Third Course. (3) I and II. Mr. Lakness and the Staff  
 Prerequisite: course 3B or 3H with high attainment; admission on recommendation of the department.  
 Course substantially the same as 4A, but designed for students with special facility for mathematics.

- 4B. Analytic Geometry and Calculus, Fourth Course. (3) I and II.  
Prerequisite: course 4A. Mr. Flanders and the Staff  
Continuation of 4A. Geometry and analysis of functions of several variables, partial derivatives, multiple integrals.
- 4H. Analytic Geometry and Calculus, Fourth Course. (3) I and II. ———  
Prerequisite: course 4A or 4G with high attainment; admission on recommendation of the department.  
Course substantially the same as 4B, but designed for students with special facility for mathematics.
4. Analytic Geometry and Calculus. Third and Fourth Courses. (6) II.  
Prerequisite: same as for 4A. The Staff
8. Theory of Algebraic Equations. (3) I and II.  
Mr. Epstein, Mr. Robinson  
Prerequisite: two years of high school algebra (or course D) and course 3A.  
Determinants, equations of third and fourth degrees, theory of equations.
9. Introduction to Projective Geometry. (3) I and II. Mr. Flanders  
Prerequisite: course G or high school solid geometry, and course 8 or equivalent.  
Projective theory of one-dimensional forms, point and line conics, mainly by the synthetic method.
- \*10. Spherical Trigonometry. (2) I. ———  
Prerequisite: one and one-half years of high school algebra, or course D, and plane trigonometry. Not open to students who have credit in Astronomy 8.
12. Elements of Probability and Statistics. (3) I and II. (See Statistics, below.)
- 14A-14B. Calculus and Advanced Calculus. (5-5) Yr. ———  
Prerequisite: course 3B.  
Covers approximately the subject matter of courses 4A-4B, 110A-110B.
- 16A-16B. Analytic Geometry and Calculus. (3-3) Yr.  
Mr. Bishop and the Staff  
Prerequisite: two years of high school algebra or course D (passed with a grade of C or better), plane geometry, plane trigonometry.  
A short course in analytic geometry and differential and integral calculus. Primarily for students in the College of Agriculture.

## RELATED COURSE IN ANOTHER DEPARTMENT

Logic. (Philosophy 12A-12B). (3-3) Yr.

## UPPER DIVISION COURSES

- 101A-101B. Elementary Mathematics for Advanced Students. (3-3) Yr.  
Mrs. McDonald, Mr. Lakness  
101A: Mr. Lakness; 101B: Mrs. McDonald.  
Prerequisite: courses 4A-4B, 8, 9. Course 101A is not prerequisite to 101B.  
Selected topics in algebra and geometry, with particular emphasis on historical development.  
Designed for students who are preparing to teach mathematics in secondary schools.

\* Not to be given, 1954-1955.

107. Mathematics in Secondary Schools. (2) I. Mrs. McDonald  
 Enhancing content through applications; coördination; survey of materials; analysis of present-day tendencies. For seniors and graduate students. This course will be accepted in partial satisfaction of the requirement in education for the Certificate of Completion of the teacher-training curriculum.
- 109A-109B. Mathematical Logic. (3-3) Yr. \_\_\_\_\_  
 Prerequisite: Philosophy 12A and course 3B or 8.  
 Elements of mathematical logic: sentential connectives, quantifiers, identity. Introduction into metalogical problems. Examples of formalized mathematical theories.  
 Boolean algebras: fundamental notions and postulates, verification of identities, infinite operations, atomic elements, ideals, representation problem. Connections between logic and Boolean algebras.
- 110A-110B. Advanced Engineering Mathematics. (2-2) Yr. Beginning each semester. Mr. Acivos, Mr. Chambré, Mrs. McDonald  
 Prerequisite: course 4A-4B. Primarily for students in engineering.  
 Conjugate functions, hyperbolic functions, Fourier series, differential equations.
110. Advanced Engineering Mathematics. Double Course. (4) II. The Staff  
 Prerequisite: same as for 110A-110B.
- 111A-111B. Algebra. (3-3) Yr. Beginning each semester.  
 Prerequisite: courses 4A-4B, 8. Mr. Hodges, Mr. Seidenberg  
 111A: Linear dependence, matrices, characteristic values, quadratic forms.  
 111B. Groups, theory of equations, introduction to Galois theory, elements of ring theory.
- 112A. Projective Geometry. (3) II. \_\_\_\_\_  
 Prerequisite: courses 4A-4B, 9, 111A.  
 Projective coördinates. Loci of the second order. Higher plane curves.
- 112B. Metric Differential Geometry. (3) I and II. Mr. Roth  
 Prerequisite: course 4A-4B. Course 112A is not prerequisite to 112B.  
 Vector analysis. Study of curves and surfaces in three dimensions.
113. Second Course in Probability and Statistics. (3) I and II. (See Statistics, below.)
114. Introduction to the Theory of Potential. (3) II. Mr. Evans  
 Prerequisite: 110A-110B or equivalent.  
 Newtonian and vector potential, differential operators, problems related to Maxwell's equations.
- 115A-115B. The Theory of Numbers. (3-3) Yr. Mr. Lehmer  
 Prerequisite: course 8.  
 Divisibility, congruences, theory of prime numbers, Diophantine analysis, partitions.
- \*117. Analysis of Mathematical Problems. (2) I. \_\_\_\_\_  
 Prerequisite: upper division standing in mathematics; intended primarily for honor students.  
 Methods of attack on mathematical problems, without respect to particular field.

\* Not to be given, 1954-1955.

- \*118. Analysis of Mathematical Problems. (2) II. \_\_\_\_\_  
 Prerequisite: upper division standing in mathematics; intended primarily for honor students.  
 Methods of attack on mathematical problems, without respect to particular field. Course 117 is not prerequisite to 118.
- 119A-119B. Differential Equations. (3-3) Yr. Beginning each semester. \_\_\_\_\_  
 Mr. Chambré, Mr. Morse  
 Prerequisite: course 4A-4B, with honor grades; or 14A-14B; or 4A-4B and 110A-110B; or consent of instructor.  
 Differential equations and analysis. Numerical solutions of differential equations, general properties and special types of differential equations; Bessel functions and Legendre polynomials.
- 120A-120B. Theory of Probability and Statistics. (3-3) Yr. (See Statistics, below.)
- \*121. Mathematical Introduction to Economics. (3) I. \_\_\_\_\_ Mr. Evans  
 Prerequisite: course 4A-4B.  
 Monopoly, competition, theory of dimension, taxation, utility, economic dynamics.
- 127A-127B. Foundations of Mathematics. (3-3) Yr. \_\_\_\_\_ Mr. Robinson  
 Prerequisite: courses 3A-3B, 8, and Philosophy 12A or course 109A.  
 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; successive extensions—integers, rationals, real numbers; basic arithmetical operations; applications of continuity principle.
- 128A-128B. Numerical Analysis. (3-3) Yr. \_\_\_\_\_  
 (128A is equivalent of course formerly numbered 128.)  
 Prerequisite: course 110A or 119A. Course 128A is not prerequisite to 128B.  
 Practical aspects of computational methods, especially those of use in large-scale digital computers. Principles of coding and programming of computers. Analytical approximations. Finite difference methods applied to numerical integration and solution of algebraic and differential equations.
- 142A-142B. Life Contingencies. (3-3) Yr. (See Statistics, below.)
- 142C-142D. Laboratory Course in Life Contingencies. (1-1) Yr. (See Statistics, below.)
144. Population Statistics. (3) II. (See Statistics, below.)
- 150A-150B. Theory of Functions, First Course. (3-3) Yr. Beginning each semester. \_\_\_\_\_ Mr. LeCam  
 Prerequisite: course 4B.  
 Through critical development of analysis: limit theorems, Jacobians, measure, generalizations of integral, complex, and real variables.  
 Designed primarily for students who will work for higher degrees in mathematics and statistics. It may be followed by course 255A or course 201B.

185. Introduction to the Theory of Functions of a Complex Variable. (3) I and II. Mr. Chambré, Mr. Besicovitch

Prerequisite: course 119A or 150A.

Differentiability of complex functions. Cauchy's integral. Power series. Laurent series. Analytic continuation. Singularities of analytic functions. Residue theorem; applications to definite integrals. Conformal mapping. Fourier and Laplace transforms with applications. Concepts and theorems as well as manipulation will be stressed.

- 190A-190B. Survey of Algebra and Analysis. (3-3) Yr. Mr. Evans

For upper division and graduate students in social sciences, particularly economics, without college training in mathematics. Topics include elementary algebra, algebraic equations, matrices, differential and integral calculus, difference equations. Illustrations will be drawn from the social sciences, especially economics.

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

Mr. Pinney in charge

Investigation of special problems under the direction of members of the department. In particular, this course offers an opportunity to students with facility for mathematics to anticipate some of the advanced courses by individual study.

#### TEACHERS' COURSE

- \*307. Coördination of Teaching of Mathematics. (2) I and II.

Group discussion.

Mrs. McDonald

#### GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 201A-201B. Function Theory. (3-3) Yr. Mr. Epstein

Prerequisite: courses 111A, 119A-119B.

Point sets in Euclidean space, measure, generalizations of integral including Lebesgue and Lebesgue-Stieltjes integrals; classical theorems on the complex variables; application of real variable theory to complex variable.

Students with facility for mathematics may well take this course in the senior year. It includes the material of course 150A-150B.

- 205A-205B. Theory of Functions of a Complex Variable. (3-3) Yr.

Prerequisite: course 201A-201B.

Mr. Evans

The theory of analytic functions and topics such as meromorphic functions, entire functions, modular functions, and Abelian integrals, analytic theory of differential equations, inequalities, etc., at the pleasure of the instructor.

- 210A-210B. Theory of Functions of a Real Variable. (3-3) Yr. Mr. Morse

Prerequisite: course 201A-201B.

Measure theory, metric spaces, topics such as functional analysis, calculus of variations, partial differential equations, potential theory, transfinite processes, expansions, according to the pleasure of the instructor.

- 211A-211B. Theory of Linear Operators. (3-3) Yr. Mr. Wolf

Prerequisite: courses 201A-201B and either 185 or 205A.

Linear operators in Hilbert and Banach spaces. Spectral decomposition theorem. Completely continuous operators. Integral equations. Additional topics selected by the instructor.

\* Not to be given, 1954-1955.

- 215A-215B. *Topology*. (3-3) Yr. Mr. Lewy  
 Convergence, compactness, completeness, function space topologies and metrization. Connectedness, local connectedness, the fundamental group, homology theories, duality and fixed point theorems.
- 220A-220B. *Differential Equations*. (3-3) Yr. Mr. Pinney  
 General theories, topics in ordinary and partial differential equations, boundary value problems. This course presupposes some knowledge of complex and real variable theory.
- 221A-221B. *Logarithmic and Newtonian Potential*. (3-3) Yr.  
 Prerequisite: course 201A-201B or equivalent. Mr. Lakness  
 Relation to distributions of mass, analysis of harmonic functions, tensor invariants in Euclidean and Riemannian metric spaces.
- 222A-222B. *Advanced Differential Equations*. (3-3) Yr. Mr. Protter  
 Prerequisite: courses 220A-220B and either 201A-201B or 150A-150B and 185.  
 Theory of initial value and boundary value problems for hyperbolic, parabolic, and elliptic partial differential equations with emphasis on non-linear equations.
- \*225A-225B. *Metamathematics*. (3-3) Yr. Mr. Henkin  
 Prerequisite: courses 109A-109B, 127A.  
 Formalized mathematical theories. Symbols, concatenation, formulas, sentences, derivability, axiomatic basis. Consistency and completeness. Notions of model and consequence—their relations to consistency and derivability. Application to formalized number theory. Truth and probability—their mutual relations. Introduction to the decision problem.
- 230A-230B. *Algebraic Geometry*. (3-3) Yr. Mr. Seidenberg  
 Theory of algebraic functions. Algebraic varieties; in particular, algebraic curves. Bezout's theorem. Branches of a curve. Linear series. Theorem of Riemann-Roch. Emphasis will be on algebraic methods.
- 235A-235B. *Set Theory*. (3-3) Yr. Mr. Tarski  
 Prerequisite: courses 109A, 127A-127B.  
 Fundamental notions and axioms. Sets, their families, rings, fields. Finiteness and infinity. Relations, functions, images. One-to-one correspondence, set-theoretical equivalence, cardinal numbers. Similarity of relations, relation numbers. Partial and simple order. Well-ordering, arithmetic of ordinals. Applications of set theory, selected topics.
- \*240A-240B. *Differential Geometry*. (3-3) Yr.  
 Differential geometry with tensor analysis. Intrinsic geometry of surfaces. Parallel displacement of Levi Civita. Riemannian geometry of  $n$ -dimensions. Non-Riemannian geometry of Weyl and others.
- \*245A-245B. *Introduction to Modern Algebra*. (3-3) Yr. Mr. Tarski  
 Prerequisite: courses 109A-109B, 111A-111B, and 127A.  
 General notion of an algebraic system. Subalgebras. Isomorphism. Homomorphism and equivalence relations. Direct products. Free algebras. Applications of general notions to special algebraic systems: groups, rings, fields, lattices, Boolean algebras.
- 250A-250B. *Algebra*. (3-3) Yr. Mr. Flanders  
 Prerequisite: course 111A-111B.  
 Topics in theory of fields, algebraic and transcendental extensions, Galois theory, valuations, ideal theory, representation theory.



- 255A-255B. Probability Theory and Its Analytic Basis. (3-3) Yr.  
(See Statistics, below.)
- 255C-255D. Laboratory Course in Probability Theory and Its Analytic Basis.  
(1-1) Yr. (See Statistics, below.)
- 265A-265B. Advanced Probability. (3-3) Yr. (See Statistics, below.)
270. Technical Hydrodynamics. (3) II. \_\_\_\_\_  
Theoretical analyses of motion of frictionless and viscous fluids, flow  
of compressible fluids at sub- and supersonic velocities.
290. Seminars. (2-6) I and II. The Staff (Mr. Lewy in charge)  
Topics in foundations of mathematics, theory of numbers, numerical  
calculation, analysis, geometry, algebra, probability and theory of statis-  
tics, and in their applications, by means of lectures and informal confer-  
ences; work based largely on original memoirs. During 1954-1955 there  
will be, in particular, lecture seminars on the following subjects, in charge  
of the persons indicated:  
(b) Selected topics in modern algebra. I, II, Mr. Epstein, Mr. Seiden-  
burg; (c) Operators in Banach space and applied mathematics, I, II, Mr.  
Kato, Mr. Wolf; (e) Foundations and abstract algebra, I, II, Mr. Tarski;  
(f) Topics in partial differential equations, I, II, Mr. Protter; (g) Topics  
in calculus of variations and partial differential equations; I, II, Mr.  
Lewy; (j) Asymptotic expansions, I, II, Mr. van der Corput; (k) Func-  
tional analysis, I, II, Mr. Kelly; (l) Topics and problems of automatic  
computing, I, II, Mr. Lehmer.
295. Individual Research Leading to Higher Degrees. (2-6) I and II.  
The Staff (Mr. Lewy in charge)
- Mathematical Colloquium. (No credit) I and II.  
The Staff (Mr. Wolf in charge)  
Meetings for the presentation of original work by members of the staff  
and graduate students.

### Statistics

#### LOWER DIVISION COURSES

7. Mathematics for Insurance. (3) II. Miss Fix  
Prerequisite: course 4A.  
Compound interest. Annuities certain. Operations with actuarial  
symbols. Interpolation. Finite differences. Graduation of mortality  
tables. Summation. Numerical integration.
12. Elements of Probability and Statistics. (3) I and II.  
Mr. Blackwell, Mr. Kelley, Mr. Neyman, Mr. Sherman  
I. Mr. Sherman, Mr. Kelley; II. Mr. Blackwell, Mr. Neyman.  
Prerequisite: two years of high school algebra or course D.  
For students wishing to specialize in statistics as well as for those  
wishing to acquire basic concepts for general education. Relative fre-  
quency. Discrete probability. Testing statistical hypotheses. Illustrations  
from genetics, bacteriology, industrial sampling and public health.

#### UPPER DIVISION COURSES

113. Second Course in Probability and Statistics. (3) I and II. \_\_\_\_\_, Mr. Scheffé  
Prerequisite: courses 3A-3B or 11A-11B or 16A-16B, and course 12.  
Continuation of course 12. Expectation, variance, correlation, regres-

sion. Probability generating function. Weak law of large numbers. Elements of estimation. Cramér-Rao inequality. Basic ideas of confidence intervals. Applications.

120A-120B. Theory of Probability and Statistics. (3-3) Yr. Mr. Kraft  
Prerequisite: courses 4A-4B, 150A (may be taken concurrently), and 113. Course 111A is prerequisite to 120B. It is recommended that 120C-120D be taken concurrently.

Continuation of course 113. Theorem of Laplace (univariate and multivariate). Asymptotic distribution of  $\chi^2$ . General definition of probability. Calculus of probability densities. Likelihood ratio tests with applications. Distribution of  $\chi^2$ ,  $t$  and  $F$ . General linear hypotheses. Gauss-Markoff theorem. Elements of estimation, including confidence intervals.

120C-120D. Laboratory Course in Theory of Probability and Statistics. (1-1) Yr. Mr. Kraft in charge

May be taken in conjunction with course 120A-120B. Course 120C is not prerequisite to 120D.

128. Numerical Analysis. (3) I. (See Mathematics, above.)

130A-130B. Statistical Inference. (3-3) Yr. Mr. Jeeves

Prerequisite for 130A: two years of high school algebra or course D; prerequisite for 130B: 130A and 3A or 11A. It is recommended that 130C-130D be taken concurrently.

A first-year course. Not open for credit to students who have completed courses 12 and 113. Not more than one of the courses 130A, 130E, 130G may be taken for credit.

The basic concepts and principal tools of probability theory, hypothesis testing, and estimation, presented for students of natural and social sciences. While the conceptual and applicational aspects are treated carefully, the more difficult mathematical theorems are stated without proof.

130C-130D. Laboratory Course in Statistical Inference. (1-1) Yr. Mr. Jeeves in charge

May be taken in conjunction with course 130A-130B. Course 130C is not prerequisite to 130D.

130E. Statistical Inference for Engineers. (3) I and II. Mr. Scheffé  
Lectures and laboratory.

Not open for credit to students who have completed courses 12 and 113. Not more than one of the courses 130A, 130E, 130G may be taken for credit.

Prerequisite: course 4A-4B or consent of instructor.

Essential elements of course 130A-130B with all of the applications and illustrations chosen from the field of engineering.

\*130G. Statistical Inference for City Planning. (3) I. \_\_\_\_\_  
Lectures and laboratory.

Not open for credit to students who have completed courses 12 and 113. Not more than one of the courses 130A, 130E, 130G may be taken for credit.

Prerequisite: two years of high school algebra or course D.

Essential elements of course 130A-130B with the applications and illustrations chosen from such fields as sampling from and growth of human populations.

\* Not to be given, 1954-1955.

132. Descriptive Statistics. (3) II. Mr. Hodges  
 Lectures and laboratory.  
 Prerequisite: course 113 or 130A; and course 4A-4B, or grade of at least B in course 3A-3B or 11A-11B.  
 Collective and individual characters. Mathematical statistics as theory of collective characters. Means. Measures of dispersion. Frequency curves. Moments. Sheppard's corrections. Pearson curves. Curves of Charlier. Methods of fitting. Stochastic explanation of various distributions. Multivariate distributions. Static regressions and correlations. Applications.
- 142A-142B. Life Contingencies. (3-3) Yr. Miss Fix  
 Prerequisite: courses 12 and 113 or 130A and 130C. It is recommended that 142C-142D be taken concurrently.  
 Mortality tables and related functions. Laws of mortality. Annuities and assurances for one and more than one life. Policy reserves. Return of premiums. Rule of uniform seniority. Disability insurance. Some statistical applications of the mortality table. Survey of mortality tables.
- 142C-142D. Laboratory Course in Life Contingencies. (1-1) Yr.  
 Miss Fix in charge  
 May be taken in conjunction with course 142A-142B.
144. Population Statistics. (3) II. Miss Fix  
 Prerequisite: courses 12 and 3A, or 130A.  
 Collection of data. Intercensal and postcensal populations. Formulas for mortality tables. Incompleteness of population data. Incompleteness of birth and death registrations. Infant mortality rates. Errors in age. Construction of mortality tables.
166. Sampling Surveys. (3) I. Mr. Putter  
 Prerequisite: Mathematics 12 or 130A or consent of instructor.  
 Recommended: course 113.  
 Mathematical theory of sampling. Best linear unbiased estimates and their variances. Sampling methods: unrestrictedly random, stratified and double sampling methods of Friedman-Wilcox. Sequential approach to stratification of the sample.

GRADUATE COURSES

Courses 255A-255B and 260A-260B constitute the basis of graduate instruction for students whose primary interest is in theory. Similarly, courses 280A-280B, 281, and 261 represent the core of the graduate program for students interested in statistics as a tool in empirical research, either experimental or observational.

With the approval of the instructor, students engaged in empirical research may register in appropriate courses without the indicated prerequisites.

In addition to supervised practical work during the laboratory courses, the students registered in these courses will be able to use the laboratory at other times.

- 202A-202B. Theory of Probability and Statistics. (3-3) Yr. Mr. Jeeves  
 Prerequisite: 12 units of upper division mathematics with honor grades.  
 An advanced treatment of the material covered in courses 12, 113, 120A-120B, designed as a unique statistical prerequisite for course 260A-260B. It is recommended that course 202C-202D be taken concurrently.

202C-202D. Laboratory Course in Theory of Probability and Statistics. (1-1) Yr. Mr. Jeeves in charge

It is recommended that course 202A-202B be taken concurrently. Course 202C is not prerequisite to 202D.

254. Generating Functions. (3) II. Mr. Besicovitch

Prerequisite: courses 150A-150B and 185.

Trigonometric integrals. Characteristic functions. Laplace transform. Mellin transform. Applications to difference equations.

255A-255B. Probability Theory and Its Analytic Basis. (3-3) Yr.

Mr. Blackwell

Prerequisite: courses 150A-150B and 185. It is recommended that course 255C-255D be taken concurrently.

Basic concepts of measure theory: sets, measures, measurable functions, integrals. Axiomatic foundations of probability theory. Distribution functions and characteristic functions. Central limit problem; infinitely divisible laws. Strong laws of large numbers.

255C-255D. Laboratory Course in Probability Theory and Its Analytic Basis. (1-1) Yr. Mr. Blackwell in charge

Prerequisite: course 150A-150B and 185.

May be taken concurrently with 255A-255B. Illustrative examples in probability theory and applications to probability problems in various fields such as statistical physics.

256. Nonparametric Inference. (3) I.

Mr. Lehmann

Prerequisite: course 260A.

Theory of some current tests. Asymptotic distribution theory. Unbiased and consistent point estimation. Theory of optimum rank tests and of tests based on permutation of observations. Tolerance and confidence limits.

258. Theory of Statistical Decision Functions. (3) I. Mr. Blackwell

Prerequisite: course 260A-260B.

Theory of statistical decision functions as a generalization of theories of tests and of estimation. Decision problems viewed as two-person zero sum games. Determinateness. Bayes solutions. Characterization of complete families and of minimax procedures. Applications to specific decision problems.

\*259. Probability Models of Natural Phenomena. (3) II.

Prerequisite: course 260A-260B.

Relation between natural phenomena and their mathematical theory. Interpolation formula and structural model. Deterministic and stochastic models. Static stochastic models. Dynamic stochastic models. Problem of adequacy. Examples from astronomy, general biology, and economics.

260A-260B. Advanced Topics in Probability and Statistics. (3-3) Yr.

Mr. Neyman, Mr. LeCam

Prerequisite: courses 111A, 120A-120B, and 150A-150B or 201A-201B, 185. Course 255A is prerequisite to 260B. It is recommended that 260C-260D be taken concurrently.

Continuation of course 120A-120B. Early principles of statistical tests. Testing simple hypotheses. Best similar and best invariant tests of composite hypotheses. Linear hypothesis. Confidence intervals. Introduc-

tion to multivariate statistical analysis. Sequential and nonparametric statistical analysis. Theory of point estimation.

260C-260D. Laboratory Course in Advanced Topics in Probability and Statistics. (2-2) Yr. Mr. Neyman in charge

May be taken concurrently with course 260A-260B. Course 260C is not prerequisite to 260D.

261. Statistical Problems in Experimentation. (3) II. Mr. Scheffé  
Lectures and laboratory.

Prerequisite: some familiarity with analysis of variance and consent of instructor.

Mathematical models of experimental problems. Random and systematic designs. Complex experiments. Randomized blocks. Latin and Graeco-Latin squares. Biological assay. Recent developments in the theory of experimental design.

\*262. Statistical Inference in Relation to Stochastic Processes. (3) I.

Prerequisite: course 255A-255B and 260A-260B or consent of instructor.

Stochastic processes and certain types of hypotheses concerning them. Observable variables. Tests of hypotheses. Problems of estimation.

\*263. Statistical Studies of Risks. (3) I.

Lectures and laboratory.

Prerequisite: course 130A-130B or 113.

Life and sickness tables. Standard error of a table. Law of Gompertz-Makeham. Standardization of rates of risk. Epidemiological and medical statistics. Theory of growth. Simple random processes explaining various population phenomena. Problems of social and commercial insurance.

\*264. Statistical Problems of Mass Production and Control of Quality. (3) I.

Lectures and laboratory.

Prerequisite: course 113 or 130A or 130E.

Variability in manufactured products. Controlled accuracy of analyses and controlled variability of manufactured products. Sampling designed to protect interests of manufacturer and of consumer. Estimation of percentage defective. Identification of causes of defects.

\*265A-265B. Advanced Probability. (3-3) Yr.

Prerequisite: course 255A-255B or consent of instructor.

Recent developments in the theory of probability. Stochastic processes. Markoff chains. Weak and strong central limit problems in the case of dependence.

267. Large Sample Theory. (3) II.

Mr. LeCam

Prerequisite: course 260A.

General convergence theorems. Classical properties of maximum likelihood estimates. Regularly best asymptotically normal estimates and related tests, including the  $\chi^2$  test. Likelihood ratio and related tests.

269A-\*269B. Recent Developments in the Theory of Statistics. (3-3) Yr.

269A: I and II.

Mr. Lehmann

Prerequisite: courses 255A, 260A.

Recent developments in the theories of hypothesis testing, estimation, and multiple decisions.

\* Not to be given, 1954-1955.

- 280A. Advanced Statistical Inference. (3) I. Mr. Hodges  
 Prerequisite: course 130A-130B or consent of instructor. It is recommended that course 280C be taken concurrently.  
 Estimation and testing linear hypotheses. Simple experimental designs. Multiple comparisons. Variance components. Analysis of covariance. Illustrations adjusted to the interests of the audience in each year.
- 280B. Advanced Statistical Inference. (3) II. Mr. Hodges  
 Prerequisite: 280A or consent of instructor. It is recommended that course 280D be taken concurrently.  
 Nonparametric methods. Introduction to sequential analysis. Analysis of quantile response data. Illustrations adjusted to the interests of the audience in each year.
- 280C-280D. Laboratory Course in Advanced Statistical Inference. (1 or 2; 1 or 2) Yr. Mr. Hodges in charge  
 May be taken concurrently with courses 280A and 280B. Course 280C is not prerequisite to 280D.
281. Analysis of Discrete Observations. (3) I. Miss Fix  
 Prerequisite: course 130A-130B or course 120A-120B.  
 Discrete models. Discrete distributions and their limits. Transformations. Chi-square and other best asymptotically normal methods.
- 290M. Seminar on Statistical Problems in Engineering. (2-6) II.  
 Prerequisite: consent of instructor.  
 Correlation and regression studies. Pitfalls. Statistical design of cause-and-effect studies in engineering research.
- \*290P. Seminar in Probability. (2-6) I and II. \_\_\_\_\_
- \*290Q. Structure of Stochastic Processes. (2-6) II. \_\_\_\_\_  
 Prerequisite: consent of instructor.  
 The role of partial ordering in stochastic theories. Differences between random point functions and random set functions. Fourier analysis of time series.
- 290S. Statistical Seminar. (2-6) I and II. Mr. Neyman in charge
- 290W. Seminar on Statistical Problems in Economic and Agricultural Economics. (2-4) I. Mr. Konijn  
 Prerequisite: consent of instructor.  
 Statistical problems in the measurement of economic magnitudes and relations. Correlation and regression studies. Current research.
- 295S. Individual Research Leading to Higher Degrees. (2-6) I and II. The Staff (Mr. Neyman in charge)
- Statistics Colloquium. (No credit) I and II. The Staff  
 Meetings for the presentation of original work by members of the staff and graduate students.

\* Not to be given, 1954-1955.

**MILITARY SCIENCE AND TACTICS**

(Department Office, 149 Gymnasium for Men)

Thomas L. Waters, Colonel, Artillery; *Professor of Military Science and Tactics (Chairman of the Department)*.

Arthur J. Hoeman, Lieutenant Colonel, Ordnance Corps; *Associate Professor of Military Science and Tactics*.

Clifton S. Lindsey, Lieutenant Colonel, Corps of Engineers; *Associate Professor of Military Science and Tactics*.

Thomas C. Malone, Lieutenant Colonel, Artillery; *Associate Professor of Military Science and Tactics*.

Glyn W. Pohl, Lieutenant Colonel, Infantry; *Associate Professor of Military Science and Tactics*.

Wilford B. Gratruck, Major, Ordnance Corps; *Associate Professor of Military Science and Tactics*.

Vaughn R. Moss, Major, Artillery; *Associate Professor of Military Science and Tactics*.

Glenn W. Pape, Major, Transportation Corps; *Associate Professor of Military Science and Tactics*.

Michael J. Di Salvo, Captain, Artillery; *Assistant Professor of Military Science and Tactics*.

Stephan J. Guss, Jr., Captain, Quartermaster Corps; *Assistant Professor of Military Science and Tactics*.

Kenneth M. Moore, Jr., Captain, Corps of Engineers; *Assistant Professor of Military Science and Tactics*.

William H. Schultz, Captain, Military Police Corps; *Assistant Professor of Military Science and Tactics*.

John E. Steinke, Captain, Signal Corps; *Assistant Professor of Military Science and Tactics*.

Clarence E. Wolfinger, Jr., Captain, Infantry; *Assistant Professor of Military Science and Tactics*.

William F. Magill III, First Lieutenant, Infantry; *Instructor in Military Science and Tactics*.

**LOWER DIVISION COURSES**

The lower division or basic courses meet the requirement established by the Board of Regents for military training in the first and second undergraduate years. Enrollment is limited to students who are male citizens of the United States, able-bodied, and under twenty-three years of age at the time of initial enrollment. A first-year or second-year student claiming exemption because of noncitizenship, physical disability, age, or prior military service will present a petition to the Registrar on the prescribed form for such exemption. Pending action on his petition, the student will enroll in the course prescribed for his year and enter upon the work thereof. These courses consist of three hours of formal instruction per week for two academic years. Instruction is given in subjects common to all branches of the Army. Uniforms and textbooks, as required, are provided by the government and must be returned in good condition on completion of the course.

The A part of a course is not a prerequisite for the B part of a course in either basic or advanced Military Science and Tactics courses.

- 1A. Military Science I. (2) I. The Staff (Mr. Hoeman in charge)  
Organization of the Army and ROTC; individual weapons and marksmanship; leadership, drill, and exercise of command.
- 1B. Military Science I. (2) II. The Staff (Mr. Hoeman in charge)  
American military history; leadership, drill, and exercise of command.
- 21A. Military Science II. (2) I. The Staff (Mr. Lindsey in charge)  
Prerequisite: courses 1A, 1B, or their equivalent.  
Crew-served weapons and gunnery; American military history; map and aerial photograph reading; leadership, drill, and exercise of command.
- 21B. Military Science II. (2) II. The Staff (Mr. Lindsey in charge)  
Prerequisite: courses 1A, 1B, or their equivalent.  
Crew-served weapons and gunnery; leadership, drill, and exercise of command.

#### UPPER DIVISION COURSES

Students who successfully complete the basic course or who have received credit in lieu thereof may apply for enrollment in the advanced course. For admission to the upper division or advanced course, a student must:

1. Be a male citizen of the United States and be regularly enrolled in the University.
2. Not have reached twenty-seven years of age at the time of initial enrollment.
3. Be selected by the Professor of Military Science and Tactics and the President of the University.
4. Successfully complete such survey and screening tests as may be prescribed.
5. Pass successfully a prescribed physical examination.
6. Have attained upper division standing in the University.
7. Execute a written agreement with the government to complete the two-year advanced course, including attendance at summer camp, and to accept a reserve commission, if tendered.

The advanced course consists of five hours of formal instruction per week for two academic years. Instruction is given in subjects common to all branches of the Army. It includes a summer camp of six weeks' duration, held between the two academic years of the advanced course. The number enrolled may vary from year to year and is dependent upon a quota allotted annually.

An officer-type uniform is furnished to the student which becomes his personal property upon successful completion of the advanced course. Each student receives during the two-year period a monthly monetary allowance at a daily rate equal to the value of the commuted ration, as announced by the Department of the Army. Students attending the summer camp receive pay at the rate of \$78 per month, railroad fare to and from camp, quarters, clothing, uniforms, meals, and medical services. Acceptance by the student of any of the monetary allowances listed above will make completion of the advanced course a prerequisite to graduating from the University, unless he is excused from this requirement by authority of the Secretary of the Army.

Successful completion of the advanced course, R.O.T.C., and four years of education at college level, qualifies the student for appointment and commission by the President as a second lieutenant in the United States Army Reserve.

Based upon the needs of the service and the professional training, aptitude,



and preference of the individual, the graduate is commissioned in one of the branches of the Army. During the second year of the advanced course each student is asked to choose the arm or service in which he desires to be commissioned with alternate choices. All choices are reviewed by a faculty board, composed of both civilian and military personnel, which submits its recommendations to the Department of the Army.

Those students who have successfully completed the advanced R.O.T.C. course and who have been selected by the Professor of Military Science and Tactics and the President of the University for scholastic excellence and outstanding qualities of leadership may be designated "Distinguished Military Graduates." Such Distinguished Graduates are considered for direct commission in the Regular Army, if they are eligible for appointment under the pertinent laws.

For further information about the Reserve Officers' Training Corps, consult the Professor of Military Science and Tactics in Room 149, Gymnasium for Men.

- 131A. Military Science III. (3) I. The Staff (Mr. Gratricks in charge)  
Prerequisite: courses 21A, 21B, or their equivalent.  
Organization, function, and mission of the arms and services; crew-served weapons and gunnery; leadership, drill, and exercise of command.
- 131B. Military Science III. (3) II. The Staff (Mr. Gratricks in charge)  
Prerequisite: courses 21A, 21B, or their equivalent.  
Tactics; signal communications; military teaching methods; leadership, drill, and exercise of command.
- 140A. Advanced Infantry (Second Year). (3) I. Mr. Pohl  
Prerequisite: courses 130A and 130B.  
Leadership, drill, and exercise of command; organization; command and staff; military administration; psychological warfare; military teaching methods; new developments; motors and transportation; communications procedures.
- 140B. Advanced Infantry (Second Year). (3) II. Mr. Pohl  
Prerequisite: courses 130A and 130B.  
Leadership, drill, and exercise of command; supply and evacuation; troop movements; the military team; tactics—"The Infantry Battalion in the Attack and Defense"; military law; geographical foundations of national power.
- \*141A. Military IV. (3) I. \_\_\_\_\_  
Prerequisite: courses 131A and 131B.  
Command and staff; estimate of situation and combat orders; military intelligence; military team; troop movements; motor transportation; leadership, drill, and exercise of command.
- \*141B. Military Science IV. (3) II. \_\_\_\_\_  
Prerequisite: courses 131A and 131B.  
Training management; military administration; military justice; service orientation; supply and evacuation, leadership, drill, and exercise of command.
- 142A. Advanced Corps of Engineers (Second Year). (3) I. Mr. Lindsey  
Prerequisite: courses 132A and 132B.  
Leadership, drill, and exercise of command; military administration; psychological warfare; command and staff; motor movements; engineer support for army; communications zone; combat intelligence.

\* Not to be given, 1954-1955.

- 142B. Advanced Corps of Engineers (Second Year). (3) II. Mr. Moore  
Prerequisite: courses 132A and 132B.  
Leadership, drill, and exercise of command; military law and boards; engineer support for air forces; river-crossing operations; construction, utilities and job management; geographical foundations of national power.
- 143A. Advanced Signal Corps (Second Year). (3) I. Mr. Steinke  
Prerequisite: courses 133A and 133B.  
Leadership, drill, and exercise of command; Signal Corps wire communications equipment and matériel; photographic practices and processing techniques; military administration; military teaching methods; command and staff; combat intelligence; psychological warfare.
- 143B. Advanced Signal Corps (Second Year). (3) II. Mr. Steinke  
Prerequisite: courses 133A and 133B.  
Leadership, drill, and exercise of command; Signal Corps radio communications equipment and matériel; higher echelon Signal Corps communications and equipment; Signal Corps operations and administrative procedures at military camps, posts, and stations; military law; career guidance program for Signal Corps officers; geographical foundations of national power.
- 144A. Advanced Artillery (AA) (Second Year). (3) I. Mr. Malone  
Prerequisite: courses 134A and 134B.  
Leadership, drill, and exercise of command; military teaching methods and administration; psychological warfare; AA tactics, advanced; supply and evacuation; map reading; field artillery tactics.
- 144B. Advanced Artillery (AA) (Second Year). (3) II. Mr. Malone  
Prerequisite: courses 134A and 134B.  
Leadership, drill, and exercise of command; military law; AA matériel; military team; command and staff; new developments; combat intelligence; geographical foundations of national power; AA gunnery.
- 145A. Advanced Ordnance Corps (Second Year). (3) I. Mr. Gratricks  
Prerequisite: courses 135A and 135B.  
Leadership, drill, and exercise of command; military teaching methods; military administration; psychological warfare; maintenance and supply; command and staff; combat intelligence.
- 145B. Advanced Ordnance Corps (Second Year). (3) II. Mr. Gratricks  
Prerequisite: courses 135A and 135B.  
Leadership, drill, and exercise of command; military law and boards; matériel specialty; geographical foundations of national power; guided missiles.
- 146A. Advanced Quartermaster Corps (Second Year). (3) I. Mr. Guss  
Prerequisite: courses 136A and 136B.  
Leadership, drill, and exercise of command; military administration; military teaching methods; psychological warfare; quartermaster operations in the zone of the interior; quartermaster operations in the theater of operations.
- 146B. Advanced Quartermaster Corps (Second Year). (3) II. Mr. Guss  
Prerequisite: courses 136A and 136B.  
Leadership, drill, and exercise of command; military law and boards; organization and functions of the combatant arms; organization and

functions of the technical services; fiscal procedures; procurement procedures; command and staff; technical intelligence; combat intelligence; geographical foundations of national power.

- 147A. Advanced Transportation Corps (Second Year). (3) I. Mr. Pape  
Prerequisite: courses 137A and 137B.  
Leadership, drill, and exercise of command; rail operations in theaters of operations; logistics and overseas supply; military administration; teaching methods; psychological warfare; communications; combat and transportation intelligence; transportation service in a theater of operations.
- 147B. Advanced Transportation Corps (Second Year). (3) II. Mr. Pape  
Prerequisite: courses 137A and 137B.  
Leadership, drill, and exercise of command; command and staff functions; military law; movements control; geographical foundations of national power; the installation transportation officer; the Transportation Corps officer.
- 148A. Advanced Military Police Corps (Second Year). (3) I. Mr. Schultz  
Prerequisite: courses 138A and 138B.  
Leadership, drill, and exercise of command; military administration; psychological warfare; military teaching methods; guerrilla warfare; map and aerial photograph reading; control of individuals in the field; prisoners of war; division.
- 148B. Advanced Military Police Corps (Second Year). (3) II. Mr. Schultz  
Prerequisite: courses 138A and 138B.  
Leadership, drill, and exercise of command; military law and boards; the military team; supply and evacuation; military government; combat intelligence; geographical foundations of national power; organization and staff.

## MUSIC

(Department Office, 215 Music Building)

- Manfred F. Bukofzer, Ph.D., *Professor of Music (Chairman of the Department)*.
- Charles C. Cushing, M.A., *Professor of Music*.
- Edward B. Lawton, Jr., A.B., *Professor of Music*.
- Joaquin Nin-Culmell, Diplôme de fin d'Etudes, Schola Cantorum; Premier Accessit de Composition Musicale, Conservatoire National, Paris, *Professor of Music*.
- Ernest Bloch, *Professor of Music, Emeritus*.
- Albert I. Elkus, M.L., *Professor of Music, Emeritus*.
- \*David D. Boyden, M.A., *Associate Professor of Music*.
- William D. Denny, M.A., *Associate Professor of Music*.
- Winifred B. Howe, M.A., *Assistant Professor of Music*.
- Andrew W. Imbrie, M.A., *Assistant Professor of Music*.
- †Joseph Kerman, Ph.D., *Assistant Professor of Music*.
- Seymour J. Shifrin, M.A., *Assistant Professor of Music*.
- Edgar H. Sparks, Ph.D., *Assistant Professor of Music*.
- Margaret Cartwright, A.B., *Associate in Music*.

\* Absent on leave, 1954-1955.

† Sabbatical leave in residence, spring semester, 1954-1955.

Mary Groom Jones, *Associate in Music.*

Reginald Krieger, A.B., *Associate in Music.*

Ernest Kubitschek, *Associate in Music.*

George H. Kyme, Ph.D., *Associate in Music and Supervisor of the Teaching of Music.*

Scott Merrick, M.A., *Associate in Music.*

Sydney C. Robinson, M.A., *Associate in Music.*

Abe Sherman, A.B., *Associate in Music.*



THE GRILLER QUARTET of the University of California:

Sidney Griller, C.B.E., F.R.A.M., *Lecturer in Music.*

Jack O'Brien, F.R.A.M., *Lecturer in Music.*

Philip Burton, F.R.A.M., *Lecturer in Music.*

Colin Hampton, F.R.A.M., *Lecturer in Music.*



James Berdahl, M.A., *Lecturer in Music and Band Leader.*

Vincent H. Duckles, Ph.D., *Lecturer in Music Bibliography.*

Otto Kinkeldey, Ph.D., *Visiting Professor of Music.*

Marjorie Gear Petray, A.B., *Lecturer in Music.*

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses; a total of not more than 8 units from courses 43, 48, 143, and 148 will be accepted as Letters and Science credit. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Denny.

*Preparation for the Major.*—Entering students who plan to major in music should confer with Miss Howe. Required: Freshman year: I, Music A, 2; II, Music 1A, 3A; Sophomore year: I, Music 3B, 21A; II, Music 4, 21B; I or II, Music 1B. The major in music presupposes ability in piano playing; an advisory examination in piano, required of all entering students, will be given by the department at the beginning of each semester. Instruction in piano, organ, voice, and orchestral instruments is offered by University Extension.

Undergraduate students transferring from other colleges should consult with the departmental major adviser before enrolling in any music course.

*The Major.*—The courses applicable to the major are arranged in three groups. The *Theory* courses provide an introduction to the materials of musical composition through analysis of representative musical works and practical exercises in the technique. The *History and Literature* courses provide a study of musical literature and the chief periods of its development. The *Performance* courses provide an opportunity to gain familiarity with musical literature through group performance.

The 24 units required for the major are to be distributed among upper division courses according to the following plan:

I. *Theory.*—At least two of the following courses: 104A, 104B, 105A, 105B, 106A, 106B, either 107A or 107B, either 108 or 109.

II. *History and Literature.*—At least two of the following semester courses: 115, 116, 117, 118, 119, 122.

III. *Performance.*—At least two of the following courses: 141, 143, 144, 145, 146, 148. Each of these courses may be repeated once without duplication of credit. The requirement may be satisfied by repeating the same course.

IV. Courses 100, 101.

Students are advised to acquire facility in reading French, German, or Italian. In addition, the department recommends as supplementary choices

among free electives: Philosophy 136A-136B and other related courses in the fields of anthropology, architecture, art, English, history, philosophy, speech, and foreign literatures.

The department does not offer individual vocal or instrumental instruction. However, it will consider recommending to the Dean a reduction of the minimum unit load for those students who wish to continue intensive private study and to take longer than the usual four years to obtain the A.B. degree. See section concerning study-list regulations in the CIRCULAR OF INFORMATION.

Students who fail to maintain an average of one grade point for each unit of work undertaken in the upper division in the Department of Music will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major in music.

*Honor Students in the Upper Division.*—Students in the honors group who have completed the major in music with distinction may receive honors at graduation.

*Teacher-Training.*—Adviser: Mr. Sparks. Candidates for the General Secondary Credential, after receiving the A.B. degree, must spend two graduate semesters at this University; the teaching major, normally completed by the end of this period, specifically requires: (a) Two courses chosen from 104A, 104B, 107A, or 107B. (b) Courses 108, 111, 435A-435B. (c) Four units chosen from 141, 143, 144, 146, 148, two units of which must be in 144. Only one unit of 148 may apply. (d) Ability in piano equivalent to that attained in four semesters of courses 327A, 327B, 327C, 327D and competence in either voice or one orchestral or band instrument, and nine units from 328A, 328B, 329A, 329B, 329C, 329D, 329E. At the discretion of the adviser portions of this work may be taken by examination. Students without previous experience in playing an orchestral or band instrument are urged to undertake work in the 329 courses as soon as possible, preferably in the lower division. Credit of 3 to 5 units in the teaching methods courses will satisfy the requirement of elective units in education. For further information, including grade-point requirements, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Beginning with the fall semester of 1953 the candidate for practice teaching in instrumental music must demonstrate ability in performance on strings, brass, and woodwinds equivalent to that which he would attain from two semesters of course 329A and one semester each of courses 329B, 329C, 329D.

*Higher Degrees.*—Advisers: M.A. degree, Mr. Cushing, Mr. Lawton; Ph.D. degree, Mr. Bukofzer. See also the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the special announcements issued by the department concerning the M.A. and Ph.D. degrees.

## GROUP I

Courses open to all students in the University.

### LOWER DIVISION COURSES

#### 10. Basic Musicianship. (2) I and II.

Mr. Sparks (in charge), Mr. Merrick, Miss Robinson  
Fundamentals of music with singing, ear training, harmonization of melodies, and conducting.

#### 27A-27B. Introduction to Musical Literature. (3-3) Yr.

27A: I and II; 27B: II.

Mr. Lawton, Mr. Sparks

Two lectures and one section meeting per week.

Course 27A or consent of instructor is prerequisite to course 27B.

Lectures, illustrations, and readings designed to furnish a general appreciation of music. Weekly section meetings for listening, discussion, and written work.

## Performance

Audition for enrollment in any performance course will be required during the period of registration. Further information may be obtained from the Department of Music.

All courses in this group may be repeated once without duplication of credit.

41. University Symphony Orchestra. (2) I and II. Mr. Nin-Culmell  
Two two-hour rehearsals per week.
43. University Concert Band. (2) II. Mr. Berdahl  
Two hour-and-a-half rehearsals and one section hour per week.
44. University Chorus. (2) I and II. Mr. Lawton  
Two hour-and-a-half rehearsals and one section hour per week.
46. Chamber Music Ensemble. (2) I and II.  
The Griller Quartet (Mr. Griller in charge)  
Four class hours per week.  
Study and interpretation of chamber music for strings and for strings and piano.
48. Piano Ensemble. (1) I and II. Mrs. Petray  
Two class hours per week.  
Study and interpretation of four- and eight-hand piano literature.

## UPPER DIVISION COURSES

- 127A. Introduction to Opera. (3) I. Mr. Kerman  
Prerequisite: course 27A-27B, or consent of instructor.  
Critical study of seven operas, such as *Dido and Aeneas*, Gluck's *Orfeo*, *Don Giovanni*, *Fidelio*, *Tristan*, *Otello*, *Pelléas*, and *Wozzeck*, emphasizing the contributions of music to a total dramatic effect.
- 127B. The Symphonies of Beethoven. (3) II. Mr. Kerman  
Prerequisite: course 27A-27B, or consent of instructor.  
Study of the nine symphonies, showing the development of Beethoven's style by means of lectures, listening, and reference to selected non-symphonic works.

## Performance

For particulars see lower division performance courses.

All courses in this group may be repeated once without duplication of credit.

141. Advanced University Symphony Orchestra. (2) I and II.  
Prerequisite: 4 units in course 41. Mr. Nin-Culmell
143. Advanced University Concert Band. (2) II. Mr. Berdahl  
Prerequisite: 4 units in course 43.
144. Advanced University Chorus. (2) I and II. Mr. Lawton  
Prerequisite: 4 units in course 44.
145. Repertory Chorus. (2) I and II. Miss Cartwright  
Prerequisite: 4 units in course 144 or equivalent and consent of instructor. Enrollment limited to thirty-two students.
146. Advanced Chamber Music Ensemble. (2) I and II.  
The Griller Quartet (Mr. Griller in charge)  
Prerequisite: 4 units in course 46.

148. Advanced Piano Ensemble. (1) I and II. Mrs. Petray

PROFESSIONAL COURSES

Each of these courses may be repeated for credit.

- 445E. Woodwind Ensemble. (½) I and II. Mr. Kubitschek  
Prerequisite: course 329C or consent of instructor.
- 455E. Brass Ensemble. (½) I and II. Mr. Krieger  
Prerequisite: course 329B or consent of instructor.

GROUP II

Courses primarily for students whose major subject is Music.

LOWER DIVISION COURSES

- A. Musicianship. (2) I.  
Mrs. Petray (in charge), Mr. Kerman, Mr. Sherman, Mr. Shifrin  
Elements of music, with ear training, sight singing, and dictation.
- 1A. Musicianship. (2) II.  
Mrs. Petray (in charge), Mr. Sherman, Mr. Shifrin  
A continuation of course A, which is prerequisite.
- 1B. Musicianship. (2) I and II. Mrs. Petray  
A continuation of course 1A, which is prerequisite.
2. Elementary Counterpoint. (3) I.  
Mr. Denny (in charge), Miss Howe, Mr. Imbrie, Mr. Shifrin  
Prerequisite: course A (may be taken concurrently) or consent of instructor.  
Sixteenth-century polyphony: theory and practice. Preparatory exercises and motet writing.
- 3A. Elementary Harmony. (3) II. Mr. Denny (in charge), Miss Howe  
Prerequisite: course 2; course 1A (may be taken concurrently) or consent of instructor.
- 3B. Intermediate Harmony. (3) I. Mr. Cushing, Mr. Shifrin  
A continuation of course 3A, which is prerequisite.
4. Intermediate Counterpoint and Harmony. (3) II.  
Prerequisite: course 3B. Mr. Cushing, Mr. Shifrin
- 21A-21B. History and Literature of Music. (3-3) Yr.  
Mr. Kerman, Mr. Sparks  
Prerequisite: courses 2 and 3A, or consent of instructor.  
Three lectures and one section meeting per week.  
A study of the development of music from antiquity to the present; lectures, listening, technical analysis, and written reports.

UPPER DIVISION COURSES

Theory

Students should take courses 100 and 101 in the junior year.

100. Keyboard Harmony. (2) I. Miss Howe, Mr. Imbrie  
Prerequisite: course 4.  
The reading of figured bass; sequences, modulations, etc., in the harmonic vocabulary of the eighteenth and nineteenth centuries.

101. Score Reading. (2) II. Miss Howe, Mr. Imbrie  
Prerequisite: course 100.
- 104A-104B. Advanced Counterpoint and Harmony. (3-3) Yr. Mr. Cushing  
Prerequisite: courses 2 and 4.
- 105A-105B. Principles of Composition. (3-3) Yr. Mr. Imbrie  
Prerequisite: course 104A-104B.
- 106A-106B. Canon and Fugue. (3-3) Yr. Mr. Denny  
Prerequisite: course 104A-104B.
- 107A-107B. Studies in Musical Analysis. (3-3) Yr. Miss Howe  
Prerequisite: course 4.
108. Instrumentation. (3) I. Mr. Denny  
Prerequisite: course 4; 101 (may be taken concurrently).  
A study of the instruments of the orchestra, leading to practice in scoring for instrumental combinations.  
Teacher-training students are advised to take this course in their junior year.
- \*109. Orchestration. (3) I. Mr. Denny  
Prerequisite: course 108.
111. Band Instrumentation. (2) II. Mr. Berdahl  
Prerequisite: courses 101 and 108.  
A study of the instruments of the band; practice in scoring for selected wind instruments and for concert band.

#### History and Literature

Courses in this group will be given in rotation: renaissance, baroque, classic, romantic, modern. Prerequisite: course 21A-21B or consent of instructor.

#### *Renaissance Period (1430-1600)*

- 115A. Survey of Renaissance Music. (3) I. Mr. Sparks

#### *Baroque Period (1600-1750)*

- \*116A. Survey of Baroque Music. (3) I. Mr. Boyden  
A survey of musical literature from Monteverdi to Handel and J. S. Bach.
- \*116E. The Performance of Baroque Music. (3) I. Mr. Boyden  
Prerequisite: experience in playing an instrument or in singing, and a reading knowledge of French, German, or Italian.

#### *Classic Period (1750-1827)*

- \*117A. Survey of Classic Music. (3) II. Mr. Kerman  
The music of the early classic schools and of Haydn, Mozart, and Beethoven.
- 117B. The Operas of Mozart. (3) II. Mr. Bukofzer
- \*117C. The String Quartets of Beethoven. (3) II. Mr. Sparks
- \*117D. The Chamber Music of Mozart. (3) I. Mr. Boyden

\* Not to be given, 1954-1955.



*Romantic Period (1820-1900)*

- 118A. Survey of Romantic Music. (3) I. Mr. Kinkeldey  
From Weber and Schubert to the end of the nineteenth century.
- \*118B. The Operas of Verdi. (3) I. Mr. Bukofzer
- \*118C. The Songs of Schubert. (3) I. Mr. Kerman  
Study of the songs will be related to Schubert's work as a whole and to the development of song composition from Mozart to Strauss and Debussy.
- 118D. Wagner's *Ring of the Nibelung*. (3) II. Mr. Shifrin

*Modern Period (1900- )*

- 119A. Survey of Modern Music. (3) II. Mr. Imbrie
- \*119C. Modern French Music. (3) II. Mr. Cushing  
Critical and analytical studies of selected works of French composers from 1870 to the present, with special reference to Fauré, Debussy, and Ravel.
- \*119D. Chamber Music of the Twentieth Century. (3) II. Mr. Imbrie  
A critical and analytical study of works by Milhaud, Stravinsky, Bartók, Sessions, and Schönberg.

*Forms and Mediums*

- \*122A. History of Opera: Baroque and Classic. (3) I. Mr. Bukofzer
- \*122B. History of Opera: Romantic and Modern. (3) II. Mr. Bukofzer

**Special Study Courses**

198. Group Special Study for Advanced Undergraduates. (2 or 3) I and II.  
The Staff (Mr. Lawton in charge)
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
The Staff (Mr. Sparks in charge)

**GRADUATE COURSES**

Consent of the instructor must be obtained before enrollment in any graduate course. For further conditions concerning admission to graduate courses, see page 10.

200. Fundamentals of Music Bibliography. (2) I. Mr. Duckles
201. Seminar: Studies in Orchestration. (2) II. Mr. Denny  
Prerequisite: course 109.  
Enrollment limited to ten students.
203. Seminar in Composition. (2-4)  
203A. Technical Projects. (2) I and II. Mr. Cushing  
203B. Free Composition. (2) I and II. Mr. Nin-Culmell  
\*203C. Advanced Composition. (2-4) I and II.  
Prerequisite: courses 105A-105B, 106A-106B, or equivalent. Students taking the course for the first time shall enroll in both 203A and 203B unless expressly excused by consent of both instructors. Repetition of 203A, 203B, and 203C will be subject to the advice of the individual instructor.

\* Not to be given, 1954-1955.

- \*205. Seminar in Choral Scoring. (2) I. Mr. Lawton
- 210A-210B. Seminar in Mensural Notation. (3-3) Yr. Mr. Lawton
211. Seminar: Studies in Music Research. (3) II. Mr. Kinkeldey  
Prerequisite: course 200.  
The work consists of two parts: a class problem designed to strengthen general background, and an individual research problem. The topic of the research problem must be approved by the instructor before the first meeting of the course.
- \*213A-213B. Seminar: Music of the Renaissance. (3-3) Yr. Mr. Kerman
- \*214A-214B. Seminar: The Sonata in the Nineteenth Century. (3-3) Yr. Mr. Sparks
- 215A-215B. Seminar: Research in Music History. (3-3) Yr. Mr. Kinkeldey  
Prerequisite: course 200.  
The topic for 1954-1955 is: reading of musical theorists.  
Topics to be considered in following years are: principles of musical structure from the Gregorian period to the present; the concerto from the Baroque period to the present; the history of dissonance treatment.
250. Seminar in the Technique of Musicological Research. (2-4) I and II. Mr. Bukofzer  
Prerequisite: courses 200, 215A-215B, 6 units from courses 210, 211, 213, or 214, and a reading knowledge of French and German.  
For prospective doctoral candidates.
298. Special Studies. (2-4) I and II. The Staff (Mr. Bukofzer in charge)  
Open to properly qualified graduate students for research or creative work. Such work shall not serve in lieu of regular courses of instruction.

## TEACHING METHODS COURSES†

Courses 327A, 327B, 327C, 327D are designed to satisfy the requirements in piano for the General Secondary Credential.

- 327A-327B. Elementary Piano. (1-1) Yr. Mr. Sherman
- 327C-327D. Intermediate Piano. (1-1) Yr. Mrs. Petray  
Prerequisite: course 327B or consent of instructor.
- 328A-328B. Vocal Technique and Methods of Teaching Voice. (2-2) Yr. Mrs. Jones  
Prerequisite: course 100.  
Principles of vocal and choral technique; voice-testing; care of adolescent voices; transposition; evaluation of teaching materials.  
May be repeated once without duplication of credit.
329. Instrumental Methods. Mr. Berdahl, Mr. Krieger, Mr. Kyme
- 329A. Stringed Instruments. (1) I and II. Mr. Kyme
- 329B. Brass Instruments. (1) I. Mr. Berdahl
- 329C. Woodwind Instruments. (1) II. Mr. Berdahl
- 329D. Percussion Instruments. (1) I. Mr. Krieger
- 329E. Ensemble: Literature for School Orchestra and Band. (1) II. Mr. Krieger
- Methods of teaching orchestra and band instruments; repertory and program planning for Secondary Schools. Each course may be repeated once without duplication of credit.

\* Not to be given, 1954-1955.

† See ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, BERKELEY.

PROFESSIONAL COURSE

- 435A-435B. Conducting. (2-2) Yr. Mr. Lawton, Mr. Nin-Culmell  
 435A. Choral Conducting; Mr. Lawton.  
 435B. Orchestral Conducting; Mr. Nin-Culmell.  
 Prerequisite: course 101 and 108 (may be taken concurrently).  
 Not open to juniors.

NAVAL SCIENCE

(Department Office, 47 Gymnasium for Men)

- Donald McGregor, Captain, U.S.N.; *Professor of Naval Science (Chairman of the Department)*.  
 George Shaw-Corthorn, Commander, U.S.N.; *Associate Professor of Naval Science*.  
 Cedric B. Bergquist, Commander, U.S.N.; *Associate Professor of Naval Science*.  
 Charles A. Hafner, Lieutenant Commander, U.S.N.R., *Associate Professor of Naval Science*.  
 Samuel L. Eddy, Captain, U.S.M.C.; *Assistant Professor of Naval Science*.  
 Charles A. Gardner, Lieutenant, SC, U.S.N.; *Assistant Professor of Naval Science*.  
 Mortimer Stevens, Lieutenant, U.S.N.; *Assistant Professor of Naval Science*.  
 Paul L. Henkels, Lieutenant (j.g.), U.S.N.; *Assistant Professor of Naval Science*.

Courses in this department are normally restricted to students who are regularly enrolled members of the Naval Reserve Officers' Training Corps. Details concerning enrollment are available in Room 47, Gymnasium for Men, Office of the Department of Naval Science. Candidates must be able to complete all requirements of the Naval R.O.T.C. curriculum, without series interference from or with other academic work which is required for the bachelor's degree.

All students enrolled in the Naval Reserve Officers' Training Corps are required to engage in drill or practical exercises two hours per week.

LOWER DIVISION COURSES

- 1A. Naval Orientation, Part I. (3) I. Mr. Henkels  
 Naval history, functions and organization, and the characteristics of naval ships.
- 1B. Naval Orientation, Part II. (3) II. Mr. Henkels  
 Survey of basis of naval justice and customs; elements of leadership; basic seamanship.
- 2A. Naval Weapons. (3) I. Mr. Stevens  
 Ammunition components, gun assemblies, major and intermediate caliber installations, machine guns, torpedoes, mines, depth charges, rockets, surface fire control.
- 2B. Naval Fire Control. (3) II. Mr. Stevens  
 Prerequisite: course 2A.  
 Antiaircraft fire control systems, naval electronics equipment, CIC operations, torpedo control, spotting, shore bombardment, guided missiles.

## UPPER DIVISION COURSES

- 101A. Navigation; Piloting. (3) I. Mr. Bergquist  
Navigation instruments and equipment; dead reckoning; piloting; maneuvering board; rules of the road; aerology.
- 101B. Navigation; Celestial. (3) II. Mr. Bergquist  
The theory and technique of surface and aerial navigation.
- 102A. Naval Engineering. (3) I. Mr. Hafner  
Naval boilers and auxiliaries; naval steam turbines; naval Diesel engines.
- 102B. Damage Control and Naval Officer Orientation. (3) II. Mr. Hafner  
Ship's stability. The last half of this course is designed to prepare the student for his first assignment afloat, and includes naval justice and leadership.
- 103M. Evolution of the Art of War. (3) I. Mr. Eddy  
Survey of the historical development of weapons, tactics, and material and illustrates the classic principles of war by a study of selected battles and campaigns.
- 104M. Basic Strategy and Tactics. (3) II. Mr. Eddy  
Designed to survey modern strategical and tactical principles, using contemporary historical events as illustrative material.
- 105M. Amphibious Warfare. (3) I. Mr. Eddy  
Broad introduction to the specialized field of amphibious warfare by a limited treatment of the factors pertaining to its planning and execution. Open to members of the Armed Forces only.
- 106M. Amphibious Warfare and Naval Officer Orientation. (3) II. Mr. Eddy  
Examination of certain amphibious operations of World War II. The last half of this course is designed to prepare the student for his first active duty and includes Naval Justice and Leadership. Open to members of the Armed Forces only.
- 107S. Naval Finance and Accounting. (3) I. Mr. Gardner  
Open to junior students only.  
Supply Corps organization; naval funds and appropriations; property appropriation and cost accounting ashore.
- 108S. Supply Afloat. (3) II. Mr. Gardner  
Prerequisite: course 107S.  
The Navy Supply system; organization and operation of the Supply Department afloat; basic accounting afloat.
- 109S. Supply Ashore. (3) I. Mr. Gardner  
Open to senior students only.  
Supply Corps organization, operation and accounting ashore.
- 110S. Supply Afloat. (3) II. Mr. Gardner  
Prerequisite: course 109S.  
Supply Corps organization, operation and accounting afloat.

## NEAR EASTERN LANGUAGES

(Department Office, 421 Library)

Walter J. Fischel, Ph.D., *Professor of Semitic Languages and Literature (Chairman of the Department of Near Eastern Languages)*.

Henry L. F. Lutz, Ph.D., D.D., *Professor of Egyptology and Assyriology, Emeritus*.

William Popper, Ph.D., LL.D., *Professor of Semitic Languages, Emeritus*.

Jørgen Laessøe, Ph.D., *Assistant Professor of Assyriology*.

*Letters and Science List*.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser*: Mr. Fischel.

*Preparation for the Major*.—Course 21A–21B; a reading knowledge of French and German.

*The Major*.—Required: 24 units, of which 16 units must be in upper division language courses in the Department of Near Eastern Languages and at least 6 units of lecture courses in the department.

Year courses begin in the fall semester only.

### Courses in History and Religion

Elective courses not requiring a knowledge of any Near Eastern language.

13. The Ancient Near East. (3) I. Mr. Laessøe  
The rise and spread of civilization in the Nile Valley, Mesopotamia, and adjacent areas from the Paleolithic Age to the 13th century B.C.

14. The Ancient Near East. (3) II. Mr. Laessøe  
The Near Eastern political and cultural development from the time of the Indo-European incursions in the second half of the 13th century B.C. to the death of Alexander the Great.

102A–102B. Religion and Mythology of Egypt, Babylonia and Assyria. (3–3) Yr. Mr. Laessøe

105A–105B. Introduction to Babylonian Literature. (2–2) Yr. Mr. Laessøe  
A survey of the major literary contributions of the Sumerians, Babylonians, and Assyrians to world culture.

110A–110B. Great Books of Near Eastern Literature. (1–1) Yr. Mr. Fischel  
110A: Great Books of Hebrew Literature. A survey of Hebrew classics, covering post-biblical, medieval and modern literature in various centers of the Orient and Europe.

110B: Great Books of Islamic Literature. A survey of the major poetical, historical and philosophical masterpieces of Arabic, Persian and Turkish literature from the rise of Islam until modern times.

125. Islamic Civilization. (2) I. Mr. Fischel  
(Formerly numbered 25.)  
A survey of the rise and development of the Mohammedan civilization and its institutions; the background for the understanding of the modern Islamic world in Asia and Africa.

130. Hebrew Civilization. (2) II. Mr. Fischel  
 A survey of the development of Hebrew civilization in various centers of the Jewish dispersion, including Babylonia, Spain and North Africa, Eastern and Western Europe and Israel.

#### Language Courses

The specific courses given in any year, the hours thereof, and the authors read will depend on the needs of the students; course in the 200 (graduate) series may be repeated for credit without duplication of work.

Course 21A-21B or a satisfactory equivalent in other languages is prerequisite to all upper division language courses in the department and is required of all majors in the department.

- 21A-21B. Elementary Hebrew. (4-4) Yr. Mr. Fischel in charge  
 Biblical Hebrew grammar and reading.
- 121A-121B. Intermediate Hebrew. (2-2) Yr. Mr. Fischel in charge  
 Reading and grammatical analysis of selections from the historical books of the Old Testament such as Joshua, Samuel, Kings or Ruth.
- 122A-122B. Modern Hebrew. (2-2) Yr. Mr. Fischel  
 Prerequisite: course 21A-21B or equivalent.  
 Reading and grammatical study of modern Hebrew literature.
- 131A-131B. Elementary Arabic. (4-4) Yr. Mr. Fischel in charge  
 Classical Arabic grammar and reading.
- 132A-132B. Intermediate Arabic. (2-2) Yr. Mr. Fischel  
 Prerequisite: course 131A-131B.  
 Selections from (A) Historical works; (B) The Thousand and One Nights.
- †140A-140B. Elementary Modern Persian. (2-2) Yr. Mr. Fischel  
 Prerequisite: course 131A-131B.  
 Grammar and reading.
- †141A-141B. Elementary Syriac (Aramaic). (2-2) Yr. Mr. Fischel  
 Elements of Biblical Aramaic or classical Syriac designed to meet the needs of major students.
- 151A-151B. Elementary Assyrian. (3-3) Yr. Mr. Laessøe
- 152A-152B. Elementary Sumerian. (2-2) Yr. Mr. Laessøe  
 Prerequisite: course 151A-151B.
- 161A-161B. Elementary Egyptian. (3-3) Yr. Mr. Laessøe  
 Prerequisite: course 21A-21B or 6 units of Greek.
- 171A-171B. Elementary Coptic. (2-2) Yr. Mr. Laessøe  
 Prerequisite: course 21A-21B or 6 units of Greek.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 Mr. Fischel

#### GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 224A-224B. Advanced Biblical Hebrew. (2-2) Yr. Mr. Fischel  
 Prerequisite: course 121A-121B.  
 Reading and grammatical analysis of prophetic or poetical books of the Bible such as Amos, Isaiah, Jeremiah or Psalms.

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

- 227A-227B. Post-Biblical Hebrew. (1-1) Yr. Mr. Fischel  
Prerequisite: course 121A-121B or 122A-122B.  
Reading of unvocalized post-biblical texts such as the Mishnah,  
Midrash, Piyutim or modern Hebrew literature.
- 232A-232B. Advanced Arabic. (2-2) Yr. Mr. Fischel  
Prerequisite: course 132A-132B.  
Reading of the Koran, poetry or modern literary works.
- †241A-241B. Advanced Syriac (Aramaic). (2-2) Yr. Mr. Fischel
- †251A-251B. Advanced Assyro-Babylonian. (2-2) Yr. Mr. Laessøe
- †252A-252B. Advanced Sumerian. (2-2) Yr. Mr. Laessøe
- †261A-261B. Advanced Egyptian. (2-2) Yr. Mr. Laessøe
- †271A-271B. Advanced Coptic. (2-2) Yr. Mr. Laessøe
- 280A-280B. Seminar. (2-5; 2-5) Yr. Mr. Fischel
- 290A-290B. Special Study. Yr. Mr. Fischel, Mr. Laessøe  
Credit according to work accomplished.

## NURSING

(Department Office, 210 Building T-8)

- Pearl Castile, R.N., Ed.D., *Associate Professor of Nursing.*  
Jeannette S. Hiller, R.N., Ed.D., P.H.N., *Associate Professor of Nursing.*  
Alice E. Ingmire, R.N., Ed.D., *Associate Professor of Nursing.*  
Amy A. MacOwan, R.N., Ed.D., *Associate Professor of Nursing.*  
Margaret A. Tracy, R.N., M.S., *Associate Professor of Nursing (Chairman of the Department).*  
Helen L. Allen, R.N., M.S., *Assistant Professor of Nursing.*  
June T. Bailey, R.N., Ed.D., *Acting Assistant Professor of Nursing.*  
Hannah M. Binhammer, R.N., M.A., *Assistant Professor of Nursing.*  
Ethel H. Curtis, R.N., M.A., P.H.N., *Assistant Professor of Nursing.*  
Mary T. Harms, R.N., M.A., *Assistant Professor of Nursing.*  
Ann E. Hill, J.D., R.N., M.P.H., P.H.N., *Assistant Professor of Nursing.*  
Marion E. Kalkman, R.N., M.A., *Assistant Professor of Nursing.*  
Dorothy K. Loveland, R.N., M.A., *Assistant Professor of Nursing.*  
Lura M. Morse, Ph.D., *Assistant Professor of Home Economics.*  
Kathryn M. Smith, R.N., M.A., *Assistant Professor of Nursing.*  
Betty Jean Broady, R.N., B.S., *Acting Instructor in Nursing.*  
Evelyn Ellis Cohelan, R.N., M.S., *Instructor in Nursing.*  
Mary Sue Evitts, R.N., B.S., *Instructor in Nursing.*  
Thelma R. Foreman, R.N., M.S., *Instructor in Nursing.*  
Dorothy C. Gunnell, R.N., M.S., *Instructor in Nursing.*  
Winifred H. Incerti, R.N., B.S., *Acting Instructor in Nursing.*  
Jean I. Jordan, R.N., M.Ed., *Instructor in Nursing.*  
Miriam F. Laycook, R.N., M.S., *Instructor in Nursing.*  
Mildred T. McGregor, R.N., B.A., *Acting Instructor in Nursing.*

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

- Ruth E. Nutting, R.N., M.S., *Instructor in Nursing.*  
 Marguerite S. Petersen, R.N., M.S., *Instructor in Nursing.*  
 Jeanne Richie, R.N., M.A., *Instructor in Nursing.*  
 Marilyn J. Zabrowski, R.N., B.S., *Acting Instructor in Nursing.*  
 Mary E. Mueller, M.A., *Associate in Home Economics.*



- Ellen Simpson, M.D., *Instructor in Pediatrics.*  
 Phylis Haley, Ph.D., *Lecturer in Educational Psychology.*  
 Eugene Finkle, M.D., *Instructor in Obstetrics and Gynecology.*  
 William A. Kornhauser, Ph.D., *Instructor in Sociology and Social Institutions and Lecturer in Sociology, School of Nursing.*  
 Ida M. Oswald, M.S.W., *Lecturer in Social Welfare.*  
 Donald E. Pickering, M.D., *Instructor in Pediatrics.*  
 A. Rodney Prestwood, M.D., *Clinical Instructor in Psychiatry.*  
 Paul Sanazero, M.D., *Clinical Instructor in Medicine.*  
 Alex C. Sherriffs, Ph.D., *Associate Professor of Psychology and Lecturer in Child Psychology, School of Nursing.*  
 William W. Stiles, M.D., M.P.H., *Associate Professor of Public Health.*  
 Frances A. Torrey, M.D., *Associate Clinical Professor of Dermatology.*



- Olive E. Walkley, R.N., B.N., A.B., *Lecturer in Psychiatric Nursing.*

(GIVEN AT BERKELEY)

The following courses are open only to students eligible for enrollment in the curricula for graduate nurses.

PROFESSIONAL COURSES

- |   |              |
|---|--------------|
| 416. Health Teaching. (3) I and II.                                   | Miss MacOwan |
| 418. The Nurse in Public Health. (3) I and II.                        | Mrs. Curtis  |
| 419. The Field of Public Health Nursing. (3) I and II.                | Miss MacOwan |
| Prerequisite: course 418 or consent of instructor.                    |              |
| 432. Principles of Nursing Education. (2) I.                          | Mrs. Bailey  |
| 434. Principles of Ward Management and Teaching. (3) II.              | Mrs. Bailey  |
| Prerequisite: course 432 and Education 110; or consent of instructor. |              |

GRADUATE COURSES

As a condition of enrollment in a graduate course, the student must have been admitted to the Graduate Division, Northern Section, and have completed 15 units of advanced work basic to the proposed major subjects for a higher degree; be certified by the School of Nursing as to eligibility to complete the program; and satisfy professional requirements as established by the School of Nursing.

Specific prerequisites: (Academic) 5 units of education courses including Education 110, and 5 units of upper division social science courses including Social Welfare 100; (Professional) 5 or 6 units chosen from courses 416, 418, 419, 432, and 434.

Any graduate course may not be given if fewer than four students enroll.

200. Problems of Administration in Nursing. Seminar. (2) I. Mrs. Bailey  
 Basic material of study will be school surveys; national surveys and contributions to education in the field of administration.



201. Surveys in Nursing. (3) II. Miss Tracy  
Lectures and laboratory.  
Training in practical application of principles and techniques developed in school surveys, including additional field work equivalent to two hours per week.
202. Principles and Techniques of Supervision in Nursing. Seminar. (2) Miss MacOwan  
I and II.  
A consideration of the principles and techniques of supervision.
203. Nursing Staff Personnel Problems. (3) I and II. Mrs. Ingmire  
A course designed for administrators and teachers in leadership positions and for those concerned with teacher welfare.
204. Curriculum Development in Nursing. (3) I and II. Miss Castile  
Problems of curriculum construction as they relate to the selection and organization of material into units of instruction.
205. Problems in Curriculum Development. (2) I and II.  
Prerequisite: course 204. Miss MacOwan, Miss Castile  
Designed especially for administrators, supervisors, and teachers who have problems in curriculum development.
206. Curriculum and Teaching Problems in Nursing. Practicum. (4-6) Miss Castile in charge  
I and II.  
Prerequisite: course 204.  
An opportunity for qualified students to work on practical curriculum and teaching problems under guidance.
207. Historical Foundations of Nursing. (3) I and II. Mrs. Ingmire  
An evaluation of cultural, religious, secular, military, and educational influences upon nursing. Emphasis on international relationships.
208. Counseling. (3) I and II. Mrs. Ingmire  
A comprehensive analysis of the problems and programs of counseling in nursing.

## (GIVEN AT SAN FRANCISCO)

For more detailed description of the following courses see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

## PROFESSIONAL COURSES

410. Field Work in Public Health Nursing. (6-9) I and II. Mrs. Curtis, Miss Hill  
Prerequisite: completion of requirements for the Bachelor of Science degree with a major in Public Health Nursing at the University of California, Berkeley, and previous experience in a public health agency.  
Instruction and supervised practice in public health nursing in selected agencies. Approximately forty hours a week for two to three months. This course does not satisfy requirements for the Certificate of Completion in Public Health Nursing.
420. Field Work in Public Health Nursing. (12) I and II. Mrs. Curtis, Miss Hill  
Prerequisite: completion of requirements for the Bachelor of Science degree with a major in Public Health Nursing at the University of California, Berkeley.  
Instruction and supervised practice in public health nursing in selected agencies.

## 433. Field Work in Nursing Education. (12) I and II.

Miss Tracy and the Staff  
Prerequisite: completion of requirements for the Bachelor of Science degree with a major in Nursing Education at the University of California, Berkeley.

Instruction and supervised practice in nursing education techniques at the University of California Medical Center.

## 443. Field Work in Nursing Education. (12) I and II.

Miss Kalkman  
Prerequisite: completion of requirements for the Bachelor of Science degree with a major in Nursing Education at the University of California, Berkeley, and course 433.

Instruction and supervised practice in psychiatric nursing techniques at Langley Porter Clinic.

## 416A. Health Teaching. (1) I.

Mrs. Hiller

418. The Nurse in Public Health. (3) I.  
Parallels course 418 given at Berkeley.

Mrs. Hiller

## 418E. Community Nursing. (2) I and II.

Mrs. Hiller

## 421. History of Nursing. (2) I and II.

Miss Allen

## 423. Professional Adjustments. (1) I and II.

Mrs. Bailey

## 425. Pathology. (1) I and II.

\_\_\_\_\_

## 427A-427B. Pharmacology and Therapeutics. (2-1) Yr.

427A: I and II; 427B: II.

Miss Binhammer, Miss Laycook

## 435A. Nursing Arts. (5) I and II. Mrs. Gunnell, Miss Jordan, Miss Broady

## 440A. Introduction to Medicine. (2) II.

Miss Torrey

## 440E. Medical Nursing. (2) I and II.

Miss Binhammer

## 440F. Medical Nursing. (2) I and II.

Miss Binhammer

## 441A. Introduction to Psychiatry. (1) II.

Mr. Prestwood

## 441E. Psychiatric Nursing. (2) I and II.

Miss Walkley, Mrs. Cohelan

## 442A. Introduction to Surgery. (2½) II.

\_\_\_\_\_

## 442E. Surgical Nursing. (2) I and II.

Miss Loveland, Miss Harms

## 442F. Surgical Nursing. (2) I and II.

Miss Loveland, Miss Harms

## 444A. Introduction to Pediatrics. (2) II.

\_\_\_\_\_

## 444E. Pediatric and Communicable Disease Nursing. (2) I and II.

Miss Smith

## 446. Introduction to Communicable Diseases. (2) I and II.

\_\_\_\_\_

## 448A. Introduction to Obstetrics and Gynecology. (3) II.

\_\_\_\_\_

## 448E. Obstetrical and Gynecological Nursing. (2) I and II. Miss Evitts

## UPPER DIVISION COURSES

## EDUCATION

110. Introduction to Educational Psychology. (3) I and II. Miss Haley  
Parallels Education 110 given at Berkeley.

## HOME ECONOMICS

104. Diet Therapy. (3) II. Miss Morse  
Prerequisite: Home Economics 111.
111. Nutrition. (3) I and II. Miss Morse  
Parallels Home Economics 111 given at Berkeley.

## PSYCHOLOGY

111. Child Psychology. (2) II. Mr. Sherriffs  
Parallels Psychology 111 given at Berkeley.

## PUBLIC HEALTH

145. Community Control of the Communicable Diseases. (3) I. Mr. Stiles  
Parallels Public Health 145 given at Berkeley.

## SOCIAL WELFARE

100. The Field of Social Welfare. (3) I and II. Mrs. Oswald  
Parallels Social Welfare 100 given at Berkeley.

## SOCIOLOGY

160. The City. (3) I and II. Mr. Kornhauser

## OCEANOGRAPHY

*Marine Sciences*

Courses in oceanography leading to the master's or doctor's degree in oceanography and certain of the marine sciences are offered for a limited number of qualified students at the Scripps Institution of Oceanography at La Jolla, California. Detailed information concerning the courses may be found in the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES. For further information concerning the Institution refer to the Registrar of the University of California, 405 Hilgard Avenue, Los Angeles 24, or write to the Director of the Institution.

## OPTOMETRY

(Department Office, 101 Optometry Building)

Kenneth B. Stoddard, Ph.D., *Professor of Physiological Optics and Optometry (Chairman of the Department).*

Meredith W. Morgan, Jr., Ph.D., *Professor of Physiological Optics and Optometry.*

Gordon L. Walls, Sc.D., *Professor of Physiological Optics and Optometry and Lecturer in Physiology.*

Ralph S. Minor, Ph.D., Sc.D., *Professor of Physics and Optometry, Emeritus.*

Frederick L. Mason, M.A., *Assistant Professor of Optometry, Emeritus.*

Owen C. Dickson, M.D., *Associate Clinical Professor of Ophthalmology.*

- Henry B. Peters, M.A., *Associate Clinical Professor of Optometry.*  
 Jack T. Hobson, B.S., *Assistant Professor of Optometry.*  
 Elwin Marg, Ph.D., *Assistant Professor of Optometry.*  
 Edward Philip Drescher, M.D., M.S., *Assistant Clinical Professor of Ophthalmology.*  
 James T. Crosby, Jr., B.S., *Clinical Instructor in Optometry.*  
 Ferd T. Elvin, A.B., *Clinical Instructor in Optometry.*  
 Merton C. Flom, M.Opt., *Clinical Instructor in Optometry.*  
 Robert F. Harrigan, B.S., *Clinical Instructor in Optometry.*  
 Frederick W. Hebbard, M.S., *Clinical Instructor in Optometry.*  
 Frank V. Johnson, Jr., M.Opt., *Clinical Instructor in Optometry.*  
 Robert W. Lester, A.B., *Clinical Instructor in Optometry.*  
 Edward Ralph Ligon, B.Ed., B.S., *Clinical Instructor in Optometry.*  
 Fred W. Marcus, M.Opt., *Clinical Instructor in Optometry.*  
 John F. Regan, B.S., *Clinical Instructor in Optometry.*



Sherburne F. Cook, Ph.D., *Lecturer in Optometry and Professor of Physiology.*

*Letters and Science List.*—Physiological Optics 105A–105B and 106A–106B are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

#### UPPER DIVISION COURSES

*Prerequisite.*—Physics 2A–2B, 3A–3B, Chemistry 1A, 8, Mathematics 3A, Bacteriology 2, †Zoölogy 1A, †Anatomy 102, Psychology 1A, ‡33, together with all prerequisite courses, and the degree of Associate in Arts or its equivalent are prerequisite to all courses in the Department of Optometry.

101. Advanced Geometrical Optics. (3) II. Mr. Hebbard  
 Prerequisite: Physics 108A–108B.

The mathematical development of the paraxial laws of optical image formation, employing the methods of Gauss. Application to the optical devices used to evaluate and aid the functions of vision. Classroom computation of marginally corrected lenses, isekonic lenses, and contact lenses.

102A–102B. Elementary Theoretical Optometry. (3–4) Yr. Mr. Hobson, Mr. Hebbard

One unit of laboratory will be given in the second semester.

A study of the states of refraction of the eye, and correlated visual sensations, effects upon visual functions, optical methods of correction, and instruments used to detect and measure anomalous states of refraction.

---

† While Zoölogy 1A and Anatomy 102 is the preferred biological science sequence in the preoptometry program, this requirement may be satisfied for admission purposes by one of the following alternative sequences:

- Zoölogy 1A—Zoölogy 1B
- Zoölogy 1A—Comparative Anatomy
- Zoölogy 1A—Human Anatomy
- Physiology 1, 1L—Human Anatomy

Unless a course in human anatomy, which is the full equivalent of Anatomy 102 at the University of California, is offered in one of the above sequences, Anatomy 102 must be included in the junior year program of the School of Optometry.

‡ Psychology 1B may be substituted for Psychology 33.

## 103A-103B. Advanced Theoretical Optometry. (3-3) Yr.

Prerequisite: course 102A-102B.

Mr. Marg, Mr. Morgan

Extension of the principles discussed in course 102A-102B to the functions of the eyes in binocular vision. Stereoscopic vision, physical and physiological aspects of the fusion movements, binocular accommodation and convergence, strabismus and other anomalies of binocular vision, and ocular paralyses.

## PROFESSIONAL COURSES

## 401A-401B. Ophthalmic Optics. (2-2) Yr.

Mr. Peters, Mr. Marcus

Lecture and laboratory.

Lectures: history of the development of lenses and spectacles; the optical properties of different glasses; the theory of the design of spectacle lenses. Laboratory: lens surfacing, edging, beveling, mounting, neutralization, and frame fitting.

## 404A-404B. Practical Optometry. (3-3) Yr. Mr. Harrigan, Mr. Hobson

Prerequisite: courses 102A-102B and 401A-401B.

Lectures and problems dealing with physical eye examinations. A study of instruments and the techniques for their use, interpretation of examination data and prescribing of lenses, and orthoptic training.

## 406A-406B. Optometry Clinic. (2-2) Yr.

The Staff (Mr. Harrigan in charge)

Prerequisite: courses 102A-102B, 401A-401B, Physiology 115.

Complete physical eye examinations with clinic patients. The adaptation of lenses to the defective eye and the study of abnormal visual conditions.

## 407A-407B. Pathology of the Eye. (1-2) Yr. Mr. Dickson, Mr. Drescher

Prerequisite: Physiology 115.

Lectures and demonstrations dealing with the identification of pathological conditions in the eye, and the manifestation of systemic disease as indicated by the eye.

## 499. Special Study for Advanced Undergraduates. (1-4) I and II.

The Staff (Mr. Stoddard in charge)

## GRADUATE PROFESSIONAL COURSES

(Concerning conditions for admission to graduate courses, see page 10)

The Bachelor of Science degree in the School of Optometry, or its equivalent, is a prerequisite to all optometry courses of the graduate year.

## 409A-409B. Clinical Practice. (6-6) Yr.

The Staff (Mr. Stoddard in charge)

The examination and treatment, with lenses or orthoptic training, of patients with visual anomalies.

## 412A-412B. Advanced Clinical Procedures. (3-3) Yr.

Mr. Morgan, Mr. Peters, Mr. Lester

Lectures and class assignments on the orthoptics of strabismus and other binocular anomalies, aniseikonia, subnormal vision, telescopic spectacles, contact lens fitting, and allied subjects.

## 414A-414B. Seminar in Clinical Problems. (2-2) Yr.

The Staff (Mr. Stoddard in charge)

A discussion of the various phases of optometry associated with problems arising from clinical cases.

- 416A-416B. Advanced Pathology of the Eye. (2-2) Yr. Mr. Drescher  
An advanced consideration of topics covered in courses 407A-407B with particular reference to the application of this knowledge to the determination of diseases of the visual system in clinic patients.
417. Optometric Law and Economics. (1) II. Mr. Harrigan, Mr. Hebbard  
A consideration of the laws governing the practice of optometry, and the problems associated with the establishing of a professional optometric practice.

### PHYSIOLOGICAL OPTICS

#### UPPER DIVISION COURSES

- 105A-105B. Physiological Optics. (3-3) Yr. Mr. Stoddard, Mr. Marg, Mr. Walls  
Prerequisite: for course 105A, Physics 108A-108B, Physiology 115; for course 105B, consent of instructor.  
Lectures on the physics, physiology, and psychology of vision.  
105A: The visual pathways, the visual field, the pupil- and accommodative-mechanisms, the interaction between radiation and ocular tissue, the aberrations of the eye, illumination, and allied phenomena.  
105B: The psychophysics and physiological psychology of light, form, and color senses, and the elements of visual perception.
- 106A-106B. Physiological Optics. (1-1) Yr. Mr. Marg, Mr. Walls  
Laboratory experiments in physiological optics to accompany course 105A-105B.
- \*109. Physiological Optics. (3) II. Mr. Walls  
Lectures on the physics, physiology, and psychology of vision for students in electrical engineering whose option is illumination engineering.

#### GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 201A-201B. Seminar in Advanced Physiological Optics. (2-2) Yr. Mr. Walls, Mr. Marg  
A discussion of selected topics and current research literature in the various fields associated with vision.
203. Binocular Vision and Space Perception. (2) I. Mr. Morgan  
A consideration of the precise nature of binocular vision and monocular and binocular space perception.
205. The Evolution of the Visual System. (1) II. Mr. Walls  
The structure and the functional properties of the human eye, its orbital accessories, and the central-nervous connections and adnexa, interpreted in the light of their evolutionary development.
299. Research. (2-8) I and II. The Staff (Mr. Stoddard in charge)

#### RELATED COURSES IN OTHER DEPARTMENTS

- Morphology and Physiology of the Visual System (Physiology 115).  
Mammalian Physiology (Physiology 110A-110B).  
Geometrical and Physical Optics (Physics 108A-108B).

\* Not to be given, 1954-1955.

## ORIENTAL LANGUAGES

(Department Office, 107 Durant Hall)

Peter A. Boodberg, Ph.D., *Professor of Oriental Languages.*

\*Yuen Ren Chao, Ph.D., Litt.D., *Agassiz Professor of Oriental Languages and Literature.*

Ferdinand D. Lessing, Ph.D., *Agassiz Professor of Oriental Languages, Emeritus.*

Denzel Carr, Ph.D., *Associate Professor of Oriental Languages (Chairman of the Department).*

Shih-Hsiang Chen, B.Litt., *Associate Professor of Chinese.*

Mary R. Haas, Ph.D., *Associate Professor of Siamese and Linguistics.*

Edward H. Schafer, Ph.D., *Associate Professor of Oriental Languages.*

Søren C. Egerod, fl. lic., *Acting Assistant Professor of Oriental Languages.*

Michael C. Rogers, Ph.D., *Assistant Professor of Oriental Languages.*

Donald H. Shively, Ph.D., *Assistant Professor of Oriental Languages.*

Susumu W. Nakamura, M.A., *Associate in Oriental Languages.*



Elizabeth Huff, Ph.D., *Lecturer in Oriental Languages.*

*Letters and Science List.*—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Chen (Chinese); Mr. Shively (Japanese).

*Preparation for the Major.*—

Required: (a) Emphasis on Chinese—Courses 12, 13, 14, 15.

(b) Emphasis on Japanese—Courses 9, 19, 39, 49. Recommended: course 15.

(c) Emphasis on Oriental Linguistics—One of the curricula in (a) or (b) above.

Recommended: English 25.

Sixteen units of lower division language courses in the department are prerequisite to all upper division language courses.

*The Major:*

Required: (1) With emphasis on Chinese or Japanese:

(a) Chinese: courses 103, 113, 123, 191A–191B; or Japanese: course 119, and 4 units from 129A–129B, 129C–129D, and 132.

(b) Courses 137A–137B (or 134A–134B) or 149A–149B, 198.

(c) 5 units selected from courses 100, 113, 117, 124, 133A–133B, 139, 173A–173B, 191C–191D, 193.

(2) With emphasis on Oriental Linguistics:

(a) Courses 100, 117, 123 or 139, 135, 198, and Linguistics 130, 145, 190A–190B.

(b) 3 upper division units in an Oriental language other than the language offered in satisfaction of the lower division requirement.

Recommended: a reading knowledge of French, German, or Russian.

\* Absent on leave, 1954–1955.

Undergraduate students expecting to proceed to the M.A. or the Ph.D. degree in Oriental Languages must take courses 117, 133A-133B (required only of those students whose major emphasizes Chinese), and 193 in their senior year.

Students who fail to maintain an average of at least 1.5 grade points for each unit of work undertaken in the upper division in the department will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major.

#### LOWER DIVISION COURSES

- |  |                        |
|--|------------------------|
| 7A-7B. Elementary Korean. (3-3) Yr.  | Mr. Rogers             |
| 8. Indonesian. (3) I.  | Mr. Carr               |
| An introduction to the official language of Indonesia and Peninsular Malay, a foundation for the study of Malayo-Polynesian languages in general or Classical Malay and Indonesian literature. |                        |
| 9. Elementary Modern Japanese. (5) I.  | Mr. Rogers             |
| 12. Elementary Modern Chinese. (5) I.  | Mr. Boodberg in charge |
| 13. Classical Chinese. (5) II.<br>(Formerly numbered 12B and 13.)<br>Prerequisite: course 12.  | Mr. Boodberg in charge |
| †13G. Chinese for Graduate Students. (No credit) I.<br>(Formerly numbered 12G.)  | Mr. Schafer            |
| 14. Intermediate Chinese. (5) I.<br>Prerequisite: courses 12 and 13.   | Mr. Chen               |
| †14G. Chinese for Graduate Students. (No credit) II.   | Mr. Schafer            |
| 15. Elements of Character Analysis. (1) I and II.<br>To be taken concurrently with course 13 or 14.  | Mr. Boodberg           |
| 19. Elementary Modern Japanese (continued). (5) II.<br>Prerequisite: course 9.   | Mr. Shively            |
| 39. Intermediate Modern Japanese. (4) I.<br>Prerequisite: courses 9 and 19.  | Mr. Nakamura           |
| 49. Readings in Japanese Literature. (2) I.  | Mr. Shively            |

#### COURSES IN WHICH NO KNOWLEDGE OF ORIENTAL LANGUAGES IS REQUIRED

- |   |              |
|---|--------------|
| 22. Indonesian Civilization. (2) I.   | Mr. Carr     |
| A survey of Indonesian civilization and the effects of contacts with Indian, Islamic, and Western cultures.   |              |
| 32. Japanese Civilization. (2) II.  | Mr. Shively  |
| A broad survey of Japanese civilization dealing with cultural, literary, religious, and social developments, and giving attention to the influence of Chinese and Western cultures. |              |
| 38A-38B. Great Books of Eastern Asia. (1-1) Yr.   | Mr. Boodberg |
| Lectures and assigned readings on the great classics of Eastern Asia, in English translation.   |              |
| *42. Chinese Civilization in the Asiatic Context. (2) I.  | Mr. Boodberg |

\* Not to be given, 1954-1955.

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



UPPER DIVISION COURSES

- \*100. Languages of Eastern Asia. (2) I. Mr. Boodberg  
 A survey course on the nature and distribution of the main languages of Eastern Asia.
103. Chinese Narrative Prose. (3) II. Mr. Schafer
- \*107. Intermediate Korean. (2) I. Mr. Rogers  
 May be repeated without duplication of credit.
113. Chinese Classics. (3) I. Mr. Schafer
117. Logography and the Evolution of the Chinese Language and Script. (2) II. Mr. Boodberg
- †118. Introduction to Malayo-Polynesian Linguistics. (2) II. Mr. Carr  
 Prerequisite: course 8, an equivalent knowledge of one Malayo-Polynesian language, or Linguistics 130 or 145.
119. Advanced Japanese. (4) II. Mr. Nakamura
- \*123. Chinese Grammar. (3) I. Mr. Chao
124. Readings in Modern Chinese. (2) II. Mr. Chen
128. Classical Malay Literature. (2) II. Mr. Carr  
 Prerequisite: course 8.  
 Reading of *Séjarah Melayu* or other standard texts in Roman and Arabic characters.
- \*129A-129B. Classical and Medieval Japanese Literary Texts. (2-2) Yr. Mr. Shively  
 Prerequisite: course 119 or 119A-119B.
- 129C-129D. Japanese Historical Texts and Kambun. (2-2) Yr. Mr. Shively  
 Prerequisite: course 119 or 119A-119B.
- 133A-133B. Chinese Bibliography. (2-2) Yr. Miss Huff  
 Open to seniors.
- \*134A-134B. Cantonese. (2-2) Yr. Mr. Chao  
 Not open to students with previous experience in the dialect.
135. Phonology of Ancient Chinese. (3) I. Mr. Egerod
- †137A-137B. Advanced Colloquial Chinese. (2-2) Yr. Mr. Egerod  
 An intensive course, open only to students specializing in Oriental languages, to provide training in the active use of colloquial Chinese. Three laboratory hours per week. In the second semester, one hour per week will be devoted to lectures in Chinese on elements of Chinese culture.
139. Japanese Grammar. (2) II. Mr. Carr
- †149A-149B. Advanced Colloquial Japanese. (2-2) Yr. Mr. Nakamura  
 Three laboratory hours per week.  
 An intensive course, open only to students specializing in Oriental languages, to provide training in the active use of colloquial Japanese. In the second semester, one hour per week will be devoted to lectures in Japanese on elements of Japanese culture.
154. Mongolian. (2) I and II. Mr. Rogers  
 May be repeated without duplication of credit.
164. Tibetan. (3) I and II. Mr. Nakamura  
 May be repeated without duplication of credit.

\* Not to be given, 1954-1955.

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

- 173A-173B. Chinese Philosophical Texts. (2-2) Yr. Mr. Boodberg
- †174A-174B. Thai (Siamese). (3-3) Yr. Miss Haas
- \*174C-174D. Readings in Thai. (2-2) Yr. Miss Haas
- †187. Philological Laboratory. (2) II. Mr. Schafer  
Philological analysis of an Oriental language using textual material.  
Subject for 1954-1955: Vietnamese.
- \*191A-191B. Masterpieces of Chinese Literature and Literary Criticism.  
(2-2) Yr. Mr. Chen  
191A: Verse; 191B: Belles-lettres.  
Course 112A-112B should be taken concurrently.
- 191C-191D. Masterpieces of Chinese Literature and Literary Criticism.  
(2-2) Yr. Mr. Chen  
191C: The Short Story and Essay; 191D: The Novel.
- \*193. Language and Culture in East Asia: Readings in Sinological Literature. (3) II. Mr. Schafer
198. Special Study for Advanced Undergraduates and the Senior Essay.  
(1 or 2) I and II. Mr. Shively, Mr. Schafer  
Required of all majors in Oriental Languages.
199. Special Individual Study. (1-5) I and II. Mr. Chen

## LECTURE COURSES

Prerequisite: junior standing. Knowledge of an Oriental language not required.

- 112A-112B. Survey of Chinese Literature and Literary Criticism. (2-2) Yr.  
Mr. Chen

The general characteristics, main currents, and representative authors of Chinese literature from the beginning to modern times. Texts and references in English translation critically analyzed. Course 112A is not prerequisite to 112B.

- \*132. History of Japanese Literature. (3) I. Mr. Shively  
From the beginning to modern times, emphasizing Chinese, Buddhist, and Western influences.
- †142. Civilizations of Eastern Asia. (3) I. Mr. Schafer  
Cultures of the higher civilizations, with special emphasis on the roles of religion, mythology, and folklore.
- \*151. Western and Chinese Travelers in Asia. (2) I. \_\_\_\_\_
- \*152. Marco Polo's Asia. (2) II. \_\_\_\_\_
- \*163. Readings in Pacific Literature in English Translation. (2) II.  
Mr. Carr  
A survey of literature in non-European and non-Asiatic languages (with the exception of Malay), with selections to be read in English translation. Areas: Philippines, Malaya, Indonesia, other Pacific islands.
- \*172A-172B. Buddhism as a Cultural Factor in the Far East. (2-2) Yr. \_\_\_\_\_

\* Not to be given, 1954-1955.

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

- \*182. Life and Times of Confucius. (2) I. Mr. Boodberg  
 \*188. Philological Method: Languages and Literatures of Eastern Asia.  
 (1) I. Mr. Boodberg  
 May be repeated without duplication of credit.

GRADUATE COURSES

A reading knowledge of either French or German is prerequisite to the first year of graduate work; a reading knowledge of both French and German is prerequisite to the second year.

- \*201A-201B. Buddhist Texts. (2-2) Yr. \_\_\_\_\_  
 \*208. Malayo-Polynesian Linguistics. (2) I. Mr. Carr  
 \*212A-212B. Seminar in Chinese Literary History. (2-2) Yr. Mr. Chen  
 Textual and Aesthetic Criticism.  
 213. Seminar in Philological Analysis of Chinese Sources of the Post-Han  
 Period. (2) II. Mr. Rogers  
 214A-214B. Tenth- and Eleventh-Century Texts: Sources for the Civilization  
 of the Five Dynasties Period. (2-2) Yr. Mr. Schafer  
 219. Proseminar in Bibliography and Methods in Japanese Studies. (2) I.  
 Mr. Shively  
 229. Seminar in Japanese Literature. (2) II. Mr. Shively  
 \*235A-235B. Seminar in Chinese Dialectology. (2-2) Yr. Mr. Chao  
 May be repeated without duplication of credit.  
 \*236A-236B. Seminar in Contemporary Chinese Writings on Linguistics.  
 (2-2) Yr. Mr. Chao  
 \*237A-237B. Linguistic Methods in Teaching Oriental Languages. (2-2) Yr.  
 Mr. Carr, Mr. Chao  
 A seminar and practicum devoted to the development of teaching  
 material in an Oriental language taught in the department.  
 239. Seminar in Japanese Linguistics. (2) I. Mr. Carr  
 250. Research. (1-4) I and II. The Staff (Mr. Carr in charge)

RELATED COURSES IN ANOTHER DEPARTMENT

- Phonetics and Phonemics (Linguistics 130), formerly Oriental Languages  
 167.  
 Types of Linguistic Structure (Linguistics 145), formerly Oriental Lan-  
 guages 177.  
 American Indian Languages (Linguistics 170), formerly Oriental Lan-  
 guages 178.  
 Linguistics Laboratory (Linguistics 220A-220B), formerly Linguistics  
 190A-190B.  
 Seminar in Descriptive Linguistics (Linguistics 230), formerly Oriental  
 Languages 207A-207B.  
 Seminar in Historical Linguistics (Linguistics 250), formerly Oriental Lan-  
 guages 227A-227B.

\* Not to be given, 1954-1955.

## PALEONTOLOGY

(Department Office, 310B Hearst Memorial Mining Building)

†Charles L. Camp, Ph.D., *Professor of Paleontology and Curator of Amphibians and Reptiles in the Museum of Paleontology.*

Ralph W. Chaney, Ph.D., *Professor of Paleontology and Curator of the Paleobotanical Collection in the Museum of Paleontology.*

\*J. Wyatt Durham, Ph.D., *Professor of Paleontology, Curator of Invertebrate Collections in the Museum of Paleontology.*

Robert M. Kleinpell, Ph.D., *Professor of Paleontology and Curator of Micropaleontological Collections in the Museum of Paleontology.*

Ruben A. Stirton, Ph.D., *Professor of Paleontology (Chairman of the Department), Curator of Mammals and Director of the Museum of Paleontology.*

Ralph L. Langenheim, Ph.D., *Assistant Professor of Paleontology.*

Donald E. Savage, Ph.D., *Assistant Professor of Paleontology and Curator in the Museum of Paleontology.*



Samuel P. Welles, Ph.D., *Lecturer in Paleontology and Principal Museum Paleontologist in the Museum of Paleontology.*

*Letters and Science List.*—All undergraduate courses in Paleontology are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Savage.

*Graduate Adviser:* Mr. Kleinpell.

*Preparation for the Major.*—Two types of major programs are organized on the basis of relationships to geological sciences and to biological sciences.

Required: courses 1 (3) (or Geology 3 for transferring students) and 3 (3); Botany 1 (5) or Zoölogy 1A (4); Geology 1 (3) or 5 (3); matriculation chemistry or physics. For the majors emphasizing geology, Engineering 1A-1B (3-3) and Mineralogy 6 (4) are also required; for the majors emphasizing vertebrate paleontology, Zoölogy 1A-1B (4-4) is also required.

Recommended: Chemistry 1A-1B (5-5); French and German; Geology 118 (4-6) for I (a) (see below); Anthropology 1 (4), 152 (3) for I (b) and II (b) (see below); Botany 16 (3) for II (c) (see below). A reading knowledge of two of the following three languages: French, German, and Russian is essential for efficient advanced work and is required of candidates for the Ph.D. degree.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the departmental major.

### *The Major:*

I. Paleontology and Geological Sciences.

(a) Emphasis on invertebrate paleontology; courses 102 (3), 111 (4), 112 (4); Geology 102A-102B (2-2), 103 (3); and at least five additional units

\* Absent on leave, 1954-1955.

† Sabbatical leave in residence, fall semester, 1954-1955.

of upper division courses chosen from Paleontology or Geology or Zoölogy 112 (summer seashore course) (4).

(b) Emphasis on vertebrate paleontology; courses 102 (3) or 112 (4), 125 (3), 126 (4), 127 (4), 170 (2); Geology 102A-102B (2-2), 103 (3); Zoölogy 113 (4) or 106 (4); and Zoölogy 114 (3) or Genetics 103A-103B (2-2).

(c) Emphasis on Paleobotany: courses 102 (3), 120 (3), and 121 (3), 170 (2); Botany 110A-110B (3-3); Geology 102A-102B (2-2), 103 (3); and at least 4 units chosen from courses 111 (4), 112 (4), 126 (4), 127 (4).

## II. Paleontology and Biological Sciences.

(a) Emphasis on invertebrate paleontology: courses 111 (4), 112 (4), 114 (5) or 116 (4) or 117 (4), 136 (5) or 137 (5) or 139 (5), 170 (2); Zoölogy 112 (4) (recommended: summer seashore course); and at least five additional units of upper division courses chosen from Paleontology or Zoölogy 110 (4), 114 (3), 123 (2), 125 (2), 125C (2), or Genetics 103A-103B (2-2).

(b) Emphasis on vertebrate paleontology: courses 125 (3), 126 (4), 127 (4), 170 (2); Zoölogy 106 (4), 113 (4), 114 (3) or Genetics 103A-103B (2-2); and at least four units chosen from courses 111 (4), 112 (4), 120 (3).

(c) Emphasis on paleobotany: courses 120 (3), 121 (3), 170 (2); Botany 110A-110B (3-3), 151 (3); Forestry 114 (3); and at least 6 units chosen from courses 102 (3), 111 (4), 112 (4), 126 (4), 127 (4), 137 (5).

*Honor Students in the Upper Division.*—Honors are awarded on the basis of excellent work in the major subject.

## LOWER DIVISION COURSES

1. General Paleontology. (3) I and II. Mr. Stirton  
Two lectures and one two-hour laboratory period per week, field trip.  
A survey of the history and classification of plants and animals.  
Methods of interpretation of the fossil record; fossils as evidence of the history of life; evolution of form and structure in plants and animals; sequence of floras and faunas in the rocks.
3. Vertebrate Paleontology. (3) I and II. Mr. Welles  
Two lectures and one three-hour laboratory period per week, field trip.  
Prerequisite: course 1, or Zoölogy 1A, or Geology 3, or Anthropology 1.  
The vertebrate skeleton, vertebrate evolution, principles of vertebrate paleontology.
10. Principles of Paleontology. (2) I. Mr. Chaney  
Two lectures per week; one or more field excursions half day Saturday.  
Enrollment limited to the size of classroom available. Not open to students who have credit in course 1.  
General principles of the history of life.

## UPPER DIVISION COURSES

102. Stratigraphy. (3) II. Mr. Langenheim  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: course 1 or Geology 3, and Geology 103.  
Principles involved in the origin, composition, and relationships of stratified rocks.
111. Invertebrate Paleontology. (4) I. Mr. Langenheim  
Two lectures and two three-hour laboratory periods per week.  
Prerequisite: course 1, or Geology 1 and 3, or Zoölogy 1A. Paleobiology, morphology, and systematics of the invertebrates.

112. Stratigraphic Paleontology. (4) II. Mr. Kleinpell  
Two lectures and two three-hour laboratory periods per week.  
Prerequisite: course 1 or Geology 3, and Zoölogy 1A or course 111.  
Principles of biostratigraphy and correlation.
114. Micropaleontology. (5) I. Mr. Kleinpell  
Three lectures and two three-hour laboratory periods per week.  
Prerequisite: course 112.  
Paleobiology, taxonomy, and biostratigraphy of the microfossils, with emphasis on the foraminifera.
116. Morphology and Phylogeny of the Paleozoic Invertebrates. (4) II. Mr. Langenheim  
Two lectures and two three-hour laboratory periods per week.  
Prerequisite: course 111 or Zoölogy 112 and course 1 or Geology 3.  
Advanced studies in trilobites, brachiopods, graptolites, and pelmatozoans.
- \*117. Morphology and Phylogeny of the Mesozoic and Cenozoic Invertebrates. (4) II. Mr. Durham  
Two lectures and two three-hour laboratory periods per week.  
Prerequisite: course 111 or Zoölogy 112 and course 1 or Geology 3.  
Advanced studies in mollusks, echinoids, and corals.
120. Advanced Paleobotany. (3) I. Mr. Chaney  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: any lower division course in botany or geology, or consent of instructor.
121. Tertiary Floras of Western America. (3) II. Mr. Chaney  
Lectures, proseminar, and laboratory.  
Prerequisite: course 120.
- \*125. History of the Lower Vertebrates. (3) I. Mr. Camp  
Two lectures, proseminar, and two three-hour laboratory periods per week.  
Prerequisite: course 3 or Zoölogy 106.
126. Evolution and Classification of the Mammals. (4) I. Mr. Stirton  
Two lectures, proseminar, and two three-hour laboratory periods per week.  
Prerequisite: course 3 or Zoölogy 106.
127. History and Paleoecology of Higher Vertebrates. (4) II. Mr. Savage  
Two lectures, proseminar, and two three-hour laboratory periods per week.  
Prerequisite: course 126.
136. Paleontology and Stratigraphy of the Paleozoic and Early Mesozoic. (5) I. Mr. Langenheim  
Three lectures and one laboratory period per week, field trips.  
Prerequisite: course 111.  
Invertebrate paleontology and stratigraphy of the marine Paleozoic and Early Mesozoic of the Pacific Coast.

\* Not to be given, 1954-1955.

- \*137. Paleontology and Stratigraphy of the Late Mesozoic and Cenozoic. (5) I. Mr. Durham  
 Three lectures, laboratory, and field trips.  
 Prerequisite: course 111.  
 Invertebrate paleontology and stratigraphy of the marine Late Mesozoic and Cenozoic of the Pacific Coast.
139. Cenozoic History of the West Coast of North America. (5) II. Mr. Kleinpell  
 Three lectures and two three-hour laboratory periods per week. Assigned readings.  
 Prerequisite: course 114.  
 Emphasis on correlation, sequence, and relationships of West Coast foraminiferal faunas.
170. History of Paleontology. (2) II. Mr. Camp  
 Two lectures per week.  
 Prerequisite: consent of instructor.  
 Review of discoveries and development of ideas, principles and methods, with emphasis on modern trends and theories.
199. Special Study for Advanced Undergraduates. (1-5) I and II or in field during the summer. The Staff

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- \*252. Seminar in Stratigraphy. (2) II. Mr. Langenheim  
 Current literature and general problems.
253. Seminar in Micropaleontology. (2) I and II. Mr. Kleinpell  
 Current literature and general problems.
254. Seminar in Mammalian Paleontology. (2) I and II. Mr. Stirton, Mr. Savage
255. Seminar in Vertebrate Paleontology. (2) II. Mr. Camp
- \*256. Seminar in Invertebrate Paleontology. (2) I and II. Mr. Durham  
 Current literature and general problems.
257. Seminar in Paleobotany. (2) I and II. Mr. Chaney  
 Current literature and general problems.
290. Graduate Seminar. (No credit) I and II. The Staff (Mr. Savage and Mr. Chaney in charge)  
 Prerequisite: consent of instructor for non-majors.  
 Review of recent literature and current research in the department.  
 Required of all graduate students in the department.
299. Research in Paleontology. (1-6) I and II. The Staff

## MUSEUM OF PALEONTOLOGY

The Museum of Paleontology, situated in the Hearst Memorial Mining Building on the Berkeley campus, was organized in 1921, and is supported chiefly by funds donated by the late Miss Annie M. Alexander. The Museum maintains the largest fossil collections on the Pacific Coast, and makes use of these in teaching and research. The Matthew Memorial Library of Paleontology is a branch of the General Library which provides service to both faculty and students. Anyone wishing to make use of the facilities of the Museum should address the Director.

\* Not to be given, 1954-1955.

## PHILOSOPHY

(Department Office, 4401 Dwinelle Hall)

William R. Dennes, D.Phil., LL.D., *Professor of Philosophy.*

Stephen C. Pepper, Ph.D., L.H.D., *Mills Professor of Intellectual and Moral Philosophy and Civil Polity (Chairman of the Department of Philosophy).*

Edward W. Strong, Ph.D., *Professor of Philosophy.*

George P. Adams, Ph.D., LL.D., *Mills Professor of Intellectual and Moral Philosophy and Civil Polity, Emeritus.*

Jacob Loewenberg, Ph.D., *Professor of Philosophy, Emeritus.*

Karl Aschenbrenner, Ph.D., *Associate Professor of Philosophy.*

Benson Mates, Ph.D., *Associate Professor of Philosophy.*

Celestine J. Sullivan, Ph.D., *Associate Professor of Philosophy.*

John R. Myhill, Ph.D., *Assistant Professor of Philosophy.*

Joe Tussman, Ph.D., *Assistant Professor of Philosophy.*



Robert H. Hurlbutt, III, Ph.D., *Visiting Assistant Professor of Philosophy.*

Fundamental ideas and ideals play an indispensable part in the life and activities of each culture area and epoch. They reflect the manner in which each age organizes its knowledge and the major interests of its civilization. They disclose the problems generated by the impact of traditional habits of life and thought upon the requirements imposed by new conditions and by fresh discoveries of knowledge. They portray the efforts of reflective thought to formulate more adequate concepts and ideals for the organization and interpretation of experience.

Courses offered by the Department of Philosophy provide an opportunity for the student to become acquainted with the leading ideas in terms of which men attempt at the present time to understand the broader fundamental aspects of their world and their civilization.

*Letters and Science List.*—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Sullivan.

*Preparation for the Major.*—Courses 20A-20B and 12A.

*The Major.*—Upper division courses in philosophy are arranged in three groups, A, B, and C.

Of the 24 units required for the major, 6 units must be taken from courses in Group A, 6 units from courses in Group B, and 6 units from courses in Group C. The student is allowed to select the remaining 6 units from any courses in the department, and may, with the approval of the departmental adviser, take 3 of these units in another department, provided the course selected is regarded as relevant to the major.

### LOWER DIVISION COURSES

6A-6B. Introduction to Philosophy. (3-3) Yr. Beginning each semester.

Mr. Aschenbrenner, Mr. Hurlbutt, Mr. Mates, Mr. Pepper,  
Mr. Strong, Mr. Sullivan, Mr. Tussman

Weekly section meetings for discussion and written work.

Course 6A is prerequisite to 6B. Two sections in 6A will be given in the spring semester and two sections of 6B in the fall semester.



## SOPHOMORE COURSES

- 12A-12B. Logic. (3-3) Yr. Mr. Myhill
- 20A-20B. History of Philosophy. (3-3) Yr. Mr. Dennes, Mr. Sullivan  
 I. From the Pre-Socratics to Plotinus; Mr. Dennes.  
 II. From the Scholastics to Kant; Mr. Sullivan.
- \*30. Scientific Method. (3) II. \_\_\_\_\_

## UPPER DIVISION COURSES

*General Prerequisites.*—Students enrolling in any upper division course must have completed 6 units in course 6A-6B or 20A-20B.

## GROUP A

Courses concerned with a critical analysis and appraisal of specific human interests such as art, literature, morality, religion, science, and society.

104. Ethics. (3) II. Mr. Pepper  
 Moral Values: A study and analysis of the concepts of good and right and of the criteria of conduct.
- \*108. Social Philosophy. (3) II. Mr. Dennes  
 An examination of the fundamental notions involved (a) in the explanation, and (b) in the evaluation, of social structures and processes. Basic problems of human personality and values in relation to their social matrix.
- \*112. Philosophy of Religion. (3) II. \_\_\_\_\_  
 The nature and the validity of religious ideas.
128. Political Philosophy. (3) I. Mr. Tussman  
 Analysis of political obligation and related problems.
- 136A-136B. Aesthetics. (3-3) Yr. Mr. Pepper, Mr. Aschenbrenner  
 A study of the nature of the aesthetic experience and of the work of art with detailed applications to music, the visual arts, and literature.
- \*136C. Aesthetics. (3) I. Mr. Strong  
 A study of values in applied and fine arts, and of the place and role of art in human affairs.  
 At the discretion of the instructor in course 136A, 136B, or 136C, the general prerequisites may be waived for major students in literature or in the fine arts. Course 136C together with either 136A or 136B will be counted as a year course of 6 units in aesthetics. Course 136C may be taken in addition to both 136A and 136B without loss of credit.
138. Philosophy of Art. (3) I. Mr. Hurlbutt  
 Recommended: course 136A-136B.  
 A study of the theory of art and the arts based on historical and on recent and contemporary materials.
146. Philosophy in Literature. (3) II. Mr. Sullivan  
 At the discretion of the instructor the general prerequisite may be waived for major students in literature or in the fine arts.

\* Not to be given, 1954-1955.

## GROUP B

Courses dealing with the methods of reflective thinking and the more general features of experience.

- \*102. Recurrent Types of Philosophy. (3) II. \_\_\_\_\_
- \*111. Metaphysics. (3) II. \_\_\_\_\_
- \*113. Logic. (3) II. Mr. Mates  
Prerequisite: course 12A or equivalent.
114. Theory of Knowledge. (3) I. Mr. Myhill
- \*123. Man and Nature. (2) I. \_\_\_\_\_  
A critical survey of ideas concerning the relation between man and nature, within the western tradition.
- \*124. Philosophy of Science. (3) I. \_\_\_\_\_
125. Theory of Value. (3) I. Mr. Pepper  
Enrollment limited to twenty-five students.  
A study of the sources of value with particular emphasis on purposive behavior, and on principles of evaluation in relation to both individual and social problems.
- \*133. Philosophy of Language. (3) II. Mr. Mates  
Prerequisite: six units in 6A-6B or 20A-20B; and 12A.
- 135A-\*135B. Contemporary Tendencies in Philosophy. (3-3) Yr. Mr. Mates
140. Philosophy of Law. (3) II. Mr. Tussman  
A study of philosophical problems arising in the legal context.
- \*141A-141B. Survey of Modern Logic. (3-3) Yr. \_\_\_\_\_  
An informal exposition of some of the principal notions and results of modern logic; intended primarily for students not specializing in logic.
147. Theory of Historical Inquiry. (3) II. Mr. Strong
- Mathematical Logic (Mathematics 109A). (3) I. \_\_\_\_\_

## GROUP C

Courses dealing with individual thinkers and epochs in the history of ideas. Course 20A-20B or its equivalent is prerequisite to courses in this group.

- \*103. Philosophy of the Nineteenth Century. (3) I. \_\_\_\_\_
105. Kant. (2) I. Mr. Aschenbrenner
- \*115. Medieval and Early-Modern Thought. (3) II. Mr. Strong
116. Plato. (3) II. Mr. Sullivan
- \*117. Aristotle. (3) II. \_\_\_\_\_
118. Spinoza. (3) I. Mr. Sullivan
- 119A-119B. British Empiricism. (3-3) Yr. Mr. Hurlbutt, Mr. Myhill  
119A. With special reference to Locke and Berkeley.  
119B. With special reference to Hume.

\* Not to be given, 1954-1955.

121. Hobbes. (3) I. Mr. Tussman
- \*126. Hellenistic Philosophy: The Stoics, Epicureans, and Skeptics. (3) I.  
Mr. Mates
- \*129. Leibniz. (3) II. Mr. Sullivan
- \*130. Materialism and Naturalism. (3) II. Mr. Strong  
Historical and critical studies of the chief philosophical materialists  
from Democritus to Dewey.
- \*132. History of Cartesianism to Malebranche. (3) I. \_\_\_\_\_
- \*139. Philosophy of Kierkegaard. (3) II. \_\_\_\_\_
- \*145. American Philosophy. (3) II. Mr. Aschenbrenner
199. Special Study for Advanced Undergraduates. (1-4) I and II.  
The Staff (Mr. Pepper in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

204. Seminar in Ethics. (2) I. Mr. Hurlbutt
- \*210A-210B. Seminar in the History of Philosophy. (2-2) Yr. \_\_\_\_\_
211. Seminar in Metaphysics. (2) I. Mr. Sullivan
- 213A-213B. Seminar in Logic. (2-2) Yr. Mr. Myhill
- \*214. Seminar in the Theory of Knowledge. (2) II. \_\_\_\_\_
- 216A-216B. Seminar in Plato. (2-2) Yr. Mr. Mates
- \*218A-218B. Seminar in Semantics. (2-2) Yr. Mr. Mates
- \*221. Metaphysics and Philosophical Analysis. (2) II. Mr. Aschenbrenner
222. Seminar in the Philosophy of Mind. (2) II. Mr. Aschenbrenner
- \*225. Seminar: Theory of Value. (2) II. Mr. Pepper
228. Seminar in Political Philosophy. (2) II. Mr. Tussman
- \*231. Seminar in the Philosophy of Santayana. (2) I. Mr. Sullivan
232. Seminar in Philosophical Naturalism. (2) II. Mr. Dennes
- \*236. Aesthetics from the Metaphysical Standpoint. (2) I. Mr. Pepper
238. Seminar in the Philosophy of Art. (2) I. Mr. Aschenbrenner
247. Seminar in Theories of History. (2) I. Mr. Strong
250. Special Studies. (1-6) I and II. The Staff (Mr. Pepper in charge)  
Enrollment is ordinarily restricted to students who have been admitted  
to candidacy for the doctor's degree.

\*Not to be given, 1954-1955.

## PHYSICAL EDUCATION

(Department Office, 103 Gymnasium for Men)

Anna Espenschade, Ph.D., *Professor of Physical Education.*

Franklin M. Henry, Ph.D., *Professor of Physical Education.*

Pauline Hodgson, Ph.D., *Professor of Physical Education and Associate Director of Physical Education for Women.*

Sarah R. Davis, A.B., *Assistant Professor of Physical Education, Emeritus.*

Louise S. Cobb, Ph.D., *Supervisor of Physical Education.*

Lucile K. Czarnowski, M.S., *Supervisor of Physical Education.*

Heber A. Newsom, M.A., *Supervisor of Physical Education.*

Henry A. Stone, M.S., *Supervisor of Physical Education.*

Eleanor E. Bartlett, A.B., *Associate Supervisor of Physical Education.*

Caroline W. Coleman, M.A., *Associate Supervisor of Physical Education.*

Marie H. Glass, A.B., *Associate Supervisor of Physical Education.*

Charles J. Keeney, A.B., *Associate Supervisor of Physical Education.*

Ralfe D. Miller, M.A., *Associate Supervisor of Physical Education.*

Edgar Nemir, A.B., LL.B., *Associate Supervisor of Physical Education.*

Charles A. Pease, A.B., *Associate Supervisor of Physical Education.*

Frederica Bernhard, M.S., *Assistant Supervisor of Physical Education.*

M. June Brasted, M.S., *Acting Assistant Supervisor of Physical Education.*

Lance Flanagan, M.A., *Assistant Supervisor of Physical Education.*

Maida L. Riggs, B.S., *Acting Assistant Supervisor of Physical Education.*

Everett D. Ryan, M.S., *Acting Assistant Supervisor of Physical Education.*

Robert L. Hazelwood, M.A., *Junior Supervisor of Physical Education.*

Betty F. Jordan, M.A., *Junior Supervisor of Physical Education.*

Mary L. Norrie, M.A., *Junior Supervisor of Physical Education.*

Mary Jean Pyatt, M.S., *Junior Supervisor of Physical Education.*



Clinton W. Evans, B.S., *Lecturer in Physical Education.*

Clarence M. Price, A.B., *Lecturer in Physical Education.*

Lynn O. Waldorf, A.B., *Lecturer in Physical Education.*

Arthur W. Lane, *Assistant in Physical Education.*

*Letters and Science List.*—Course 105 is included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*The incidental fee* payable by all students at the time of registration entitles students to the use of gymnasiums, swimming pools, showers, towels, lockers, tennis courts, and the athletic fields, also to the use of costumes for certain physical education activities, including swimming.

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

*Fees.*—The fee for ice skating is \$4.50.

*Fines.*—Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulation of the department:

(a) Failure to return equipment or clothing on or before the date posted for

such return at the end of each semester, or at the end of each special session of the University, or failure to return athletic supplies (balls, bats, etc.) on the date of issue, \$1 for each twenty-four hours until the full purchase price of the article has been reached. (b) Failure to meet the appointment for the physical examination, \$2. (c) Overnight use of dressing locker, \$2. Failure to empty locker within designated time, \$2.

#### LOWER DIVISION COURSE FOR MEN

1. Physical Education Activities. (a) I and II. The Staff  
Sections meet twice weekly at various hours, M Tu W Th.

The following activities are open to those found properly qualified: archery†, baseball, softball baseball, basketball, boxing, wrestling, judo, fencing, crew, American football, touch football, rugby football, golf, gymnastics, body building, tumbling, handball, squash, figure skating†, badminton, soccer, swimming, diving, tennis, track, modern dance†, folk dance†, social dance†, elementary school skills and rhythms†, trampoline, volleyball, and weightlifting. Special guidance and facilities are provided for men wishing to correct bodily defects or accomplish specific development.

A physical examination is required of all men entering the University, and a special medical examination is demanded of all athletes prior to training for, or participation in, intramural or intercollegiate competition.

#### LOWER DIVISION COURSE FOR WOMEN

26. Physical Education Activities. (a) I and II. The Staff  
Sections meet twice weekly at various hours.

The following activities are offered in elementary, intermediate, and advanced grades for women who are in good physical condition.

*Sports*: archery†, badminton, basketball, fencing, golf, hockey, figure skating†, lifesaving, swimming, tennis, field sports, skiing fundamentals.

*Dancing*: modern dance†, folk dancing†, and social dancing†.

*General Exercise*: gymnastics, tumbling and apparatus, rhythmic work, and training in standing and walking correctly.

*Individual Exercise*: group exercises adapted to individual needs.

*Elementary School Skills and Rhythms*†.

#### LOWER DIVISION COURSES FOR MEN AND WOMEN

- 5A. First Aid. (1) I and II. Miss Coleman  
(Formerly numbered 85A.)  
Standard course. Sections meet two hours per week.  
Upon successful completion of the course, the Red Cross Certificate is awarded.
- \*5B. Advanced First Aid. (No credit) I and II. Miss Coleman  
(Formerly numbered 85B.)  
Sections meet two hours per week for eight weeks.  
Upon successful completion of the course, the Red Cross Certificate is awarded.
20. Introduction to Physical Education. (1) I and II. \_\_\_\_\_, Miss Hodgson

An interpretation of the field designed to give the prospective major student an understanding of its scope.

\* Not to be given, 1954-1955.

† See Lower Division Courses for Men and Women.

26. Physical Education Activities. (†) I and II. The Staff  
 Sections meet twice weekly at various hours.  
 Archery, folk dancing, figure skating, modern dance, social dancing.
35. Rhythmic Basis of Dance and Allied Arts. (2) I. Miss Czarnowski  
 (Formerly numbered 54.)  
 This course is planned for students interested in dance, music, and art.  
 Consideration given to nature and function of rhythm, rhythmic analysis  
 and notation, rhythmic form in the temporal and spatial arts.

## UPPER DIVISION COURSE FOR MEN

171. Conditioning of Athletes and Care of Injuries. (2) I. Mr. Stone  
 (Formerly numbered 318.)  
 Lecture and a three-hour laboratory period per week.  
 Prerequisite: course 5A, Physiology 1 or Anatomy 102.  
 Modern principles and practice in conditioning and care of athletes;  
 individual variation and needs as to sleep, diet, health, and activity habits;  
 care of injuries with special emphasis on therapy, taping, and protective  
 equipment.

## UPPER DIVISION COURSES FOR WOMEN

- 160A-†160B. Theory of Dance. (3-3) Yr. Miss Czarnowski  
 160A, II; 160B, I.  
 Lectures and laboratory.  
 Prerequisite: course 35 and Psychology 1A.
- 165A. Theory of Group Athletics. (3) I. Miss Espenschade, Miss Hodgson  
 Lectures and laboratory.  
 Recommended: course 101.
- 165B. Theory of Gymnastics. (2) I. Miss Cobb  
 Lectures and laboratory.  
 Recommended: course 101. Course 165A is not prerequisite to 165B.
166. Theory of Individual Athletics. (2) II.  
 Mrs. Glass, Miss Coleman, Miss Bartlett  
 Prerequisite: a working knowledge of the activities included.

## UPPER DIVISION COURSES FOR MEN AND WOMEN

101. Kinesiology and Body Mechanics. (4) I. Miss Bartlett  
 Lectures and laboratory.  
 Prerequisite: Physiology 1, 1L, and Anatomy 102.  
 The study and application of physical structure and muscular move-  
 ments in various physical education activities. Description and applica-  
 tion of certain anatomical concepts and physical laws to joint and muscu-  
 lar action. An analysis of certain deviations from physical growth norms.
- †102. Corrective Physical Education. (3) II. Miss Bartlett  
 Prerequisite: course 101.  
 Development of programs for those individuals whom the physician has  
 diagnosed as functionally deficient; particular attention to poor circula-  
 tion, spinal deviations, etc. Analysis of causes underlying these conditions  
 and direction of students into activities suitable to their needs.

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

105. Physiological Hygiene. (4) II. Mr. Henry  
Lectures and laboratory.  
Prerequisite: high school chemistry, Home Economics 10, Physiology 1, 1L, Public Health 5A.  
The physiology of exercise; diet, ventilation, training, fatigue, and health in relation to physical activity. Individual differences in cardiovascular and respiratory function.
110. Psychologic Bases of Physical Activity. (2) I. Mr. Henry  
Prerequisite: Psychology 1A.  
Perception, motivation, learning and emotion in relation to physical activity; reaction time and coordination. Personal adjustment and social behavior as observed in play. The psychology of competition.
120. Sports in American Society. (2) I. Mr. Flanagan  
Open to all upper division students without prerequisite.  
An examination of the interrelationships of sports and physical recreation with other aspects of American culture: industrialization and urbanization, communication and transportation, war and peace. Sports and American education. The influence of ideas, ideals, traditions and democratic concepts.
130. History and Theories of Physical Education. (3) II. Mr. Stone  
Prerequisite: course 20, Physiology 1, 1L, and Psychology 1A.  
History of American and foreign physical education. Its cultural background: political, social, educational. Comparative physical education. Designed to develop critical judgment regarding the purposes and significance of physical education in modern life and education on the basis of pertinent cultural and scientific factors.
- 131A-131B. The Organization and Administration of Physical Education. (2-2) Yr. Miss Hodgson, Mr. Miller, Mr. Stone  
131A. Miss Hodgson, Mr. Miller.  
131B. Miss Hodgson, Mr. Stone.  
Prerequisite: course 130.  
Organization of the instructional, intramural, recreational, and competitive programs; criteria for the evaluation and selection of activities offered in each. The supervision and administration of gymnasium facilities and play areas; cost and maintenance of equipment; departmental organization, regulations, and policies.
135. Tests and Measurements in Physical Education. (3) II. Miss Espenschade  
Prerequisite: Education 110 or consent of instructor.  
The historical background of measurement in physical education; statistical techniques to be used in scoring tests; the construction and uses of tests; interpretation of results; evaluation of measures now available in the field; the administration of a testing program.
140. Community Recreation. (2) I. Mr. Miller  
Prerequisite: upper division standing.  
Nature, scope and significance of recreation in the social and economic life of the American people. Meaning and nature of play. History, purpose, function, organizational patterns and interrelationships of groups, agencies and institutions which serve the recreational needs of the community.  
Course 140 is not open to students who have taken course 143A or 143B; and the latter are open for two units credit to students who have taken course 140.

- 143A. Theory and Principles of Recreation. (3) I. Mrs. Glass  
Prerequisite: upper division standing.  
The meaning and significance of leisure in modern society; essential characteristics and uses of recreation; theories of play; the recreation movement in the United States.
- 143B. The Organization and Administration of Recreation. (3) II. Mr. Miller  
Prerequisite: course 143A.  
Community interrelationships affecting recreation; the recreation program; areas and facilities and their operation, recreation organization; financial support, records, personnel administration, publicity, and public relations.
- 144A. Field Laboratory Course. (No credit) Mrs. Glass  
Prerequisite: completion of the lower division requirements of the group major in recreation.  
A minimum of six weeks' full-time field experience, or its equivalent, in a variety of recreational assignments based on the needs and experience of the student.
- 144B. Field Laboratory Course. (No credit) Mrs. Glass  
Prerequisite: course 144A.  
A continuation of course 144A including additional field experience in recreational activities.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Stone in charge)  
Prerequisite: senior standing and consent of the department. Only specially qualified students will be admitted.

## METHODS COURSES FOR MEN

- 301A. The Theory and Teaching of Gymnastics and Mass Athletics. Mr. Pease  
(1) I and II.  
One lecture and two laboratory hours to be arranged.  
Prerequisite: course 1 in body building.
303. The Theory and Teaching of Track and Field Events. (1) I. Mr. Keeney  
One lecture and two laboratory hours to be arranged.
304. The Theory and Teaching of Baseball. (1) II. Mr. Evans  
One lecture and two laboratory hours to be arranged.
305. The Theory and Teaching of Basketball. (1) I. Mr. Newsom  
One lecture and two laboratory hours to be arranged.  
Prerequisite: course 1 in basketball.
306. The Theory and Teaching of Court Sports. (1) I. Mr. Miller  
One lecture and two laboratory hours to be arranged.  
Prerequisite: course 1 in tennis or consent of instructor.
308. The Theory and Teaching of Boxing and Wrestling. (1) I and II. Mr. Stone, Mr. Nemir  
Prerequisite: course 1 in boxing and wrestling.
310. The Theory and Teaching of Swimming, Diving, and Water Polo. Mr. Flanagan  
(1) I and II.  
One lecture and two laboratory hours to be arranged.  
Prerequisite: course 1 in swimming or the equivalent.



- 311. The Theory and Teaching of Lifesaving and Water Safety. (1) I and II. Mr. Flanagan  
 One lecture and two laboratory hours to be arranged.  
 Prerequisite: course 310 or the equivalent, and Red Cross Senior Life Saving Certificate.
- 313. The Theory and Teaching of American Football. (1) II. Mr. Waldorf  
 One lecture and two laboratory hours to be arranged.
- 320. Theory and Practice of Officiating in Football and Basketball. (1) I.  
 One lecture and two laboratory hours to be arranged. Mr. Newsom
- †322. The Theory and Teaching of Field Sports. (1) II. Mr. Newsom  
 One lecture and two laboratory hours to be arranged.  
 Prerequisite: consent of instructor.

METHODS COURSES FOR MEN AND WOMEN

- 343. The Theory and Teaching of Recreational Activities. (1) II. Mr. Pease  
 Lectures, demonstrations, and reading assignments.  
 Discussion of and participation in the organization and direction of recreational activities including social and group games, rhythms and dances, parties for mixed groups, and games of low organization.
- 385. First Aid Instructor's Course. (1) II. Miss Coleman  
 Prerequisite: Standard and Advanced American Red Cross First Aid Certificates.  
 Methods and techniques in teaching first aid. Students successfully completing this course are eligible to receive the American Red Cross Instructor's Certificate.

METHODS COURSES FOR WOMEN

- 333. Theory and Teaching of Lifesaving and Water Safety (Women). (1) II. Miss Bernhard  
 Prerequisite: Red Cross Senior Life Saving Certificate.  
 Instruction and practice in the techniques of swimming, of diving, and of lifesaving; the organization of this material for teaching; methods of presentation to students; standards for grading performance. A written and a practical examination are required.
- 334. The Teaching of Advanced Swimming, Diving, and Water Ballet. (1) I. Mrs. Glass  
 One lecture and two laboratory hours per week.  
 Prerequisite: qualification for advanced swimming or consent of instructor. Recommended: course 333.  
 History of swimming; mechanical analysis and progression in the teaching of swimming strokes, with emphasis upon speed strokes, and of springboard diving; development of synchronized swimming and water ballet; conduct of competitive events.

GRADUATE COURSES FOR MEN AND WOMEN

- †231. Administration of Physical Education. (2) II. Miss Hodgson
- 260A-260B. Seminar in Physical Education. (2-2) Yr. Beginning each semester. Miss Espenschade, Miss Hodgson, Mr. Henry  
 The meaning, methods, and techniques of research procedure as applied to physical education; a critical review of selected studies, litera-

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

ture, practices and procedures in the field; application of this training to a particular problem in the field.

Two sections of 260B will be offered each semester.

290. Research. (1-6) I and II. Miss Espenschade, Mr. Henry, Miss Hodgson

#### PROFESSIONAL COURSE

400A-400B. Recreational Leadership. (2-2) Yr. Mrs. Glass, Mr. Miller

Prerequisite: course 143A.

Observation, conferences, and supervised field work in community agencies.

## PHYSICS

(Department Office, 366 LeConte Hall)

Luis W. Alvarez, Ph.D., *Professor of Physics.*

Robert B. Brode, Ph.D., *Professor of Physics.*

August C. Helmholtz, Ph.D., *Professor of Physics (Vice-Chairman of the Department).*

<sup>1</sup>Francis A. Jenkins, Ph.D., *Professor of Physics.*

Charles Kittel, Ph.D., *Professor of Physics.*

Ernest O. Lawrence, Ph.D., Sc.D., LL.D., *Professor of Physics and Director of the Radiation Laboratory.*

Victor F. Lenzen, Ph.D., *Professor of Physics.*

Leonard B. Loeb, Ph.D., *Professor of Physics.*

Edwin M. McMillan, Ph.D., *Professor of Physics.*

Burton J. Moyer, Ph.D., *Professor of Physics.*

Wilson M. Powell, Ph.D., *Professor of Physics.*

Emilio G. Segrè, Ph.D., *Professor of Physics.*

Edward Teller, Ph.D., *Professor of Physics.*

Robert L. Thornton, Ph.D., *Professor of Physics.*

<sup>1</sup>Harvey E. White, Ph.D., *Professor of Physics.*

Raymond T. Birge, Ph.D., *Professor of Physics, Emeritus.*

Ralph S. Minor, Ph.D., *Professor of Physics and Optometry, Emeritus.*

William H. Williams, Graduate, United States Military Academy, *Professor of Physics, Emeritus.*

Hiram W. Edwards, Ph.D., *Associate Professor of Physics, Emeritus.*

Owen Chamberlain, Ph.D., *Associate Professor of Physics.*

William B. Fretter, Ph.D., *Associate Professor of Physics.*

Robert Karplus, Ph.D., *Associate Professor of Physics.*

Arthur F. Kip, Ph.D., *Associate Professor of Physics.*

William A. Nierenberg, Ph.D., *Associate Professor of Physics.*

Chaim Richman, Ph.D., *Associate Professor of Physics.*

\*Herbert F. York, Jr., Ph.D., *Associate Professor of Physics.*

Gerson Goldhaber, Ph.D., *Assistant Professor of Physics.*

\*Erwin L. Hahn, Ph.D., *Assistant Professor of Physics.*

Carson D. Jeffries, Ph.D., *Assistant Professor of Physics.*

Walter D. Knight, Ph.D., *Assistant Professor of Physics.*

John H. Reynolds, Ph.D., *Assistant Professor of Physics.*

Robert J. Riddell, Jr., Ph.D., *Assistant Professor of Physics.*

<sup>1</sup> In residence fall semester only, 1954-1955.

\* Absent on leave, 1954-1955.

Malvin A. Ruderman, Ph.D., *Assistant Professor of Physics.*  
 Henry B. Silsbee, Ph.D., *Assistant Professor of Physics.*  
 Earl W. Friesen, B.A., *Associate in Physics.*



Norris E. Bradbury, Ph.D., *Professor of Physics, Los Alamos Laboratory.*  
 David L. Judd, Ph.D., *Lecturer in Physics.*  
 Wulf B. Kunkel, Ph.D., *Lecturer in Physics.*  
 Samuel Silver, Ph.D., *Professor of Engineering Science.*  
 Gregor Wentzel, Ph.D., *Visiting Professor of Physics for the fall semester.*

#### MEDICAL PHYSICS

Joseph G. Hamilton, M.D., *Professor of Medical Physics, Experimental Medicine and Radiology, and Director of the Crocker Laboratory.*  
 Hardin B. Jones, Ph.D., *Professor of Medical Physics and Physiology and Assistant Director of the Donner Laboratory.*  
 John H. Lawrence, M.D., *Professor of Medical Physics, Associate Professor of General Medicine and Director of the Donner Laboratory.*  
 John W. Gofman, M.D., Ph.D., *Associate Professor of Medical Physics.*  
 Cornelius A. Tobias, Ph.D., *Associate Professor of Medical Physics.*  
 Robert K. Mortimer, Ph.D., *Instructor in Medical Physics.*  
 Victor W. Burns, B.S., *Associate in Medical Physics.*



R. Lowry Dobson, M.D., Ph.D., *Lecturer in Medical Physics.*  
 Warren M. Garrison, Ph.D., *Lecturer in Medical Physics.*  
 James E. Roberts, M.D., *Lecturer in Medical Physics.*  
 Robert W. Wijsman, Ph.D., *Lecturer in Medical Physics and Biophysics.*

*Letters and Science List.*—All undergraduate courses in physics except 125, 128, 131 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Knight, Mr. Kip.

*Preparation for the Major.*—Required: Courses 4A, 4B, 4C, or the equivalent (under special circumstances courses 2A–2B and 3A–3B may be accepted); Chemistry 1A–1B, Mathematics C, 3A–3B, 4A–4B, or their equivalents. Recommended: Mathematics 8, and a reading knowledge of French and German.

*The Major.*—The major must include courses 105A–105B, 108B, 110A–110B, 115, 121, and 3 additional units chosen, with the approval of the major adviser, from other upper division courses in physics or mathematics. Beginning in the spring semester, 1956, course 110C or 110D will be added to the major requirements with 2 additional units required, in place of the 3 units indicated above. The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the major in physics.

*Engineering Physics.*—The College of Engineering with the cooperation of the Physics Department offers a curriculum in engineering physics leading to the degree of Bachelor of Science. Major Adviser, Mr. Fretter. (See section on Program of Study in Engineering Physics in CIRCULAR OF INFORMATION, DEPARTMENTS AT BERKELEY.)

*Physics and Biology.*—It is possible in individual cases to arrange a group major in the fields of Physics and Biology, subject to the approval of the Dean of the College of Letters and Science.

*Honors.*—Honor students may do special work in course 199. Other special courses will not be given.

#### LOWER DIVISION COURSES

Courses 4A, 4B, 4C are fundamental and are designed to meet the needs of students whose major is physics and of students preparing for applications of physics in the colleges of Engineering and Chemistry.

Prerequisite for all lower division courses except course 10: (1) either high school physics or chemistry or Physics 10; (2) trigonometry (may be taken concurrently). Prerequisite for course 10: elementary algebra and plane geometry.

2A-2B. General Physics Lectures. (3-3) Yr. Beginning each semester.

Mr. Friesen, Mr. Fretter, Mr. Goldhaber, Mr. Jeffries, Mr. Kunkel

Three lectures and one discussion section per week.

Elective in the College of Letters and Science. Required for premedical students and students in architecture.

Mechanics, properties of matter, heat, sound, light, electricity and magnetism, atomic and nuclear physics.

3A-3B. General Physics Laboratory. (1-1) Yr. Beginning each semester.

Mr. Friesen

Required for premedical students. Recommended for all students who elect course 2A-2B.

Mechanics, properties of matter, heat, sound, light, electricity and magnetism, atomic and nuclear physics. Experimental work planned to accompany the lectures in course 2A-2B.

4A. General Physics. (4) I and II.

Mr. Chamberlain, Mr. Judd, Mr. Lenzen, Mr. Silsbee

Three lectures and one three-hour laboratory period per week.

Prerequisite: Mathematics 3A-3B or equivalent. Mathematics 3B may be taken concurrently.

Open to students in all colleges. Together with course 4B-4C, required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.

Mechanics, properties of matter.

4B. General Physics. (4) I and II. Mr. Kip, Mr. Knight, Mr. Reynolds

Three lectures and one three-hour laboratory period per week.

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) I and II. Mr. Helmholtz, Mr. Moyer, Mr. Ruderman

Three lectures and one three-hour laboratory period per week.

Prerequisite: courses 4A and 4B.

Open to students in all colleges. Required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.

Heat, wave motion, sound, and light.

## 10. Descriptive Introduction to Physics. (3) I and II.

Mr. Nierenberg, Mr. White

A brief presentation of some of the more important phenomena in physics, with experimental illustrations. Open to students with or without high school physics, but not open to those who have had a course in college physics.

## 24. Supplementary Laboratory Courses in General Physics. (1)

Lower Division Staff (Mr. Lenzen in charge)

These courses are intended primarily for students entering the University with partial credit in general physics and are part of the regular work of courses 4A, 4B, 4C in the semester indicated for each. Students should enroll under one or more of the following numbers:

24A. Mechanics and Properties of Matter. (1) I and II.

24B. Electricity and Magnetism. (1) I and II.

24C. Heat, Wave Motion, Sound, and Light. (1) I and II.

## 31-34. Supplementary Lecture Courses in General Physics. (1-3)

Lower Division Staff (Mr. Lenzen in charge)

These courses are intended primarily for students entering the University with partial credit in general physics. Courses 32A, 32B cover part of the lecture work in 2A-2B, and 31D covers part of the lecture work in 4C, whereas courses 34A, 34B, 34C cover the lecture work only of 4A, 4B, 4C, respectively. Students should enroll under one or more of the following numbers:

31D. Wave Motion, Sound, and Light. (2) I and II.

32A. Mechanics, Properties of Matter, Sound, and Heat. (1-3) I and II.

32B. Light, Electricity, and Magnetism. (1-3) I and II.

34A. Mechanics and Properties of Matter. (3) I and II.

34B. Electricity and Magnetism. (3) I and II.

34C. Heat, Wave Motion, Sound, and Light. (3) I and II.

## 41A. Properties of Matter. (1) I and II.

Mr. Chamberlain, Mr. Judd, Mr. Lenzen, Mr. Silsbee

Equivalent to part of 4A. Students enrolled under 41A will attend the lectures and laboratory of 4A, but will be held only for the portion of that course covering properties of matter (formerly included in course 1B).

## 41B. Heat. (1) I and II.

Mr. Helmholtz, Mr. Moyer, Mr. Ruderman

Equivalent to part of 4C. Students enrolled under 41B will attend the lectures and laboratory of 4C, but will be held only for the portion of that course covering heat (formerly included in course 1B).

## 41D. Wave Motion, Sound, and Light. (3) I and II.

Mr. Helmholtz, Mr. Moyer, Mr. Ruderman

Equivalent to part of 4C. Students enrolled under 41D will attend the lectures and laboratory of 4C, but will be held only for the portion of that course covering wave motion, sound, and light (formerly included in course 1D).

## UPPER DIVISION COURSES

Courses 4A, 4B, 4C, and differential and integral calculus are prerequisite to all upper division courses except course 108A-108B, Sec. 2.

## 104. Vector Analysis. (3) I and II.

Mr. Riddell, Mr. Ruderman

I: Mr. Ruderman; II: Mr. Riddell.

Elements of vector analysis and its application to physics. Importance of an invariant formulation of physical laws. Elements of tensor analysis only in regard to general applications.

- 105A-105B. Analytic Mechanics. (3-3 or 2†) Yr. Beginning each semester.  
Mr. Jeffries, Mr. Judd, Mr. Moyer, Mr. Reynolds, Mr. Riddell  
105A. I: Mr. Judd, Mr. Riddell; II: Mr. Reynolds.  
105B. I: Mr. Jeffries; II: Mr. Moyer.  
Prerequisite: Mathematics 110B (may be taken concurrently and may precede Mathematics 110A).  
Fundamental principles of Newtonian mechanics. Brief introduction to Lagrange's and Hamilton's equations.
- 108A. Geometrical Optics. (3) I. Mr. White  
Two lectures and one three-hour laboratory period per week.  
Prerequisite: courses 2A-2B, 3A-3B.  
Geometrical methods applied to the optics of mirrors, prisms, and lenses.
- 108B. Physical Optics. (3) I and II.  
Mr. Goldhaber, Mr. Jenkins, Mr. Reynolds  
Lectures, I: Sec. 1, Mr. Jenkins; II: Sec. 1, Mr. Reynolds; Sec. 2, Mr. Goldhaber.  
Two lectures and one three-hour laboratory period per week.  
Section 2 open only to students in optometry.  
Course 108A is not prerequisite to 108B.  
The phenomena of diffraction, interference, and polarization of light, and their applications.
- 110A-110B. Electricity and Magnetism. (3-3) Yr. Beginning each semester.  
Mr. Brode, Mr. Knight  
110A. I: Mr. Brode; II: Mr. Knight; 110B. I: Mr. Knight; II: Mr. Brode.  
Prerequisite: Mathematics 110A-110B.  
Elementary and mathematical theory of electrostatics, magnetostatics, magnetism, steady and varying currents, electron theory, and electromagnetic waves.
- 110C. Advanced Electrical Laboratory. (2) I and II.  
Mr. Jeffries, Mr. Silsbee  
The use and calibration of precision electrical instruments and electronic devices.
- 110D. Modern Physics Laboratory. (2) I and II. Mr. Jeffries, Mr. Silsbee  
Prerequisite: course 121.  
The experimental foundation for the theory of atomic structure.
112. Heat. (3) I and II. Mr. Loeb, Mr. Nierenberg  
I: Mr. Nierenberg; II: Mr. Loeb.  
The thermal properties of matter, with an introduction to the mathematical theory of heat conduction, the kinetic theory of matter, and thermodynamics.
115. Introduction to Quantum Mechanics. (3) I and II.  
I: Mr. Segrè; II: Mr. McMillan. Mr. McMillan, Mr. Segrè  
Prerequisite: courses 105A, 121, Mathematics 110A-110B.  
The classical background, basic ideas and methods of quantum mechanics, with applications to atomic physics.
121. Introduction to Atomic Structure. (3) I and II.  
Mr. Karplus, Mr. Kunkel, Mr. Loeb, Mr. Thornton  
I: Mr. Loeb, Mr. Kunkel; II: Mr. Karplus, Mr. Thornton.

† Beginning in the spring semester, 1955, credit for 105B will be 2 units.

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.

124. Radioactivity and Nuclear Structure. (3) I and II.

Mr. Goldhaber, Mr. Thornton

I: Mr. Thornton; II: Mr. Goldhaber.

Prerequisite: course 121.

Discovery of radioactivity, nature of radioactivity,  $\alpha$ ,  $\beta$ , and  $\gamma$  rays, theory of successive transformation, artificial transmutations, nuclear structure.

129A-129B. Nuclear Physics. (3-3) Yr.

Mr. Alvarez

Prerequisite: course 121.

Natural and artificial radioactivity, nuclear transformations, nuclear structure, magnetic moments, nuclear radiations, mesons, high energy physics. Designed to cover more thoroughly the material of course 124.

130. Introduction to Solid State Physics. (3) II.

Mr. Kip

Prerequisite: course 121.

An elementary treatment of the basic physics of ionic crystals, dielectrics, magnetic substances, superconductors, and the electrical and mechanical properties of metals.

199. Special Study for Advanced Undergraduates. (1 or 2) I and II.

The Staff (Mr. Birge in charge)

All special work of upper division grade not included in courses announced above. Designed to introduce students to advanced topics and to the technique and methods of research. Credit value to be fixed in each case.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

204A-204B. The Reduction of Observations. (2-2) Yr.

Mr. Birge

Instruments and methods, analytical and graphical, employed in reduction of data to final results, and errors of the results—including numerical interpolation and integration, theory of least squares, theory of errors.

205A. Advanced Dynamics. (3) I.

Mr. Lenzen

Prerequisite: course 105A-105B.

The generalized methods of Lagrange, Hamilton, and Jacobi.

205B. Advanced Dynamics. (3) II.

Mr. Silver

Prerequisite: course 105A-105B or equivalent. Course 205A is not prerequisite to 205B.

Theory of elasticity and hydrodynamics.

208A-208B. Advanced Physical Optics. (2-2) Yr.

Mr. Powell

Prerequisite: course 108B.

A résumé of the more important experimental and theoretical material concerning the properties of light, when treated as a wave motion.

210A-210B. Theory of Electricity and Magnetism. (3-3) Yr. Beginning each semester.

Mr. Chamberlain, Mr. Helmholtz, Mr. Richman

210A. I: Mr. Richman; II: Mr. Chamberlain.

210B. I: Mr. Helmholtz; II: Mr. Richman.

Prerequisite: course 110A-110B and a working knowledge of differential equations.

Classical description of the electromagnetic field, including special relativity and electron theory.

- \*211. Spectroscopy and Atomic Structure. (3) II. Mr. White  
Prerequisite: courses 108B and 121.  
Methods of excitation and analysis of line and band spectra. Energy levels of atoms and diatomic molecules interpreted in terms of the vector model. Experimental results and applications.
212. Thermodynamics. (3) I and II. Mr. Riddel, Mr. Ruderman  
I: Mr. Ruderman; II: Mr. Riddel.  
Principles of thermodynamics and applications to heat capacities, reaction equilibria, radiation, phase transitions and low temperature physics.
219. Statistical Mechanics and Kinetic Theory. (3) I and II.  
I: Mr. Kittel; II: Mr. Lenzen. Mr. Kittel, Mr. Lenzen  
Foundations of statistical mechanics. Classical and quantum statistics with applications to properties of matter; kinetic theory; gases at very low pressure; Boltzmann transport equation; irreversible processes.
- 221A-221B. Theoretical Atomic Physics. (3-3) Yr. Mr. Teller  
Physical principles of quantum theory, correspondence, complementarity; atomic states and transitions; elementary atomic and nuclear collision problems.
222. Mathematical Methods of Theoretical Physics. (3) I. Mr. Silver  
The setting up and solution of differential and integro-differential equations; statistical and algebraic methods for the treatment of problems of physics.
- 223A-223B. Advanced Quantum Mechanics of Atoms, Molecules, and Solids. (3-3) Yr. Mr. Karplus, Mr. Kittel  
223A: Mr. Karplus; 223B: Mr. Kittel.  
The first semester treats the quantum mechanics of atoms and molecules, using group theoretical methods. The second semester, which may be taken independently, treats solid state theory.
- 224A-224B. Nuclear Physics. (2-2) Yr. Mr. McMillan, Mr. Segrè  
224A: Mr. McMillan; 224B: Mr. Segrè.  
Prerequisite: a knowledge of the elements of quantum mechanics.  
The structure of the nucleus. Spontaneous nuclear transformations and radiations accompanying them. Induced nuclear reaction. Neutron physics.
- 230A-230B. Quantum Theory of Fields. (3-3) Yr. ———, Mr. Wentzel  
230A: Mr. Wentzel; 230B: ———.  
Quantization of the electromagnetic field; formal and phenomenological meson theories with applications; general relativity.
- 232A-232B. Techniques of Modern Physical Measurements. (2-2) Yr.  
The Staff (Mr. Fretter in charge)  
Open to graduate students contemplating research in contemporary physics, chemistry or engineering who have, in the instructor's opinion, the necessary background knowledge.  
An introduction to modern experimental developments in the techniques of physical measurements. Lectures on the various measuring techniques developed in recent years will be given by a number of experts in the different fields of experimentation.
290. Seminar. (1-3) The Staff (Mr. Birge in charge)  
Advanced study in various fields of modern physics. Topics will vary from year to year. The program for 1954-1955 will probably include semi-

\* Not to be given, 1954-1955.



nars in (a) Theoretical Physics (I and II, Karplus and Riddell); (b) Cosmic Rays (I and II, Brode and Fretter); (c) Discharge through Gases (I and II, Loeb); (d) Spectroscopy (I, Jenkins); (e) Nuclear Physics (I and II, Chamberlain and Segrè); (f) Molecular Beams and Low Temperature Physics (I and II, Nierenberg and Silsbee); (k) Solid State Theory (I and II, Kittel and Kip); (r) Special Topics of Meson Theory (I, Wentzel); (s) Nuclear Resonance (I and II, Jeffries and Knight).

295. Research. (1-6) I and II. The Staff (Mr. Birge in charge)

#### MEDICAL PHYSICS

125. Introduction to Medical Physics and Biophysics. (1) I.  
The Staff (Mr. Gofman in charge)  
Applications of recent advances in nuclear physics to biological and medical problems.
126. Artificial Radioactivity in the Biological Sciences. (2) II.  
Mr. Hamilton  
Prerequisite: course 2A-2B, Chemistry 1A-1B, and one of the following: Zoölogy 1A-1B, Physiology 1, 1L, or Botany 1.  
The theory, methods and interpretation of the use of artificial radioactive elements for research in the biological sciences. Special emphasis is placed upon the role of radioactive tracers for the interpretation of the dynamic aspects of metabolic phenomena in biological systems.
- 126L. Artificial Radioactivity in the Biological Sciences. (1) II.  
Laboratory work to accompany course 126. Mr. Hamilton
128. Measurement of Radiations. (3) I. Mr. Burns, Mr. Mortimer  
(Formerly numbered 128, 128L.)  
One lecture and two three-hour laboratory periods per week.  
Prerequisite: course 2A-2B, 3A-3B, or equivalent, and consent of instructor.  
An introduction to the measurement of nuclear radiations and the interaction of radiations with matter. Special attention is given to the biological methods and dosimetry.
131. Biological Effects of Radiation. (3) II. Mr. Dobson  
Two four-hour laboratory sections per week.  
Prerequisite: course 128, or 124, or equivalent, and one of the following: Physiology 108, Zoölogy 1A-1B, bacteriology laboratory, or equivalent, and consent of instructor.  
Actions of ionizing radiations and ultraviolet light on microorganisms and on higher animals. Designed to introduce students to the experimental approach to problems of radiobiologic mechanisms.
133. Physics of Biological Systems. (3) II. Mr. Tobias  
Prerequisite: courses 4A, 4B, 4C, or equivalent; Mathematics 110A, 110B or equivalent.  
Aspects of physics important for the understanding of living phenomena; portions of dynamics, electricity, kinetics, and quantum physics, as physical framework for biological phenomena.
225. The Use of Radioactive Isotopes in Experimental Medicine. (1) I.  
Mr. J. H. Lawrence  
Consideration of safe tracer doses, biologic and genetic effects, principles of internal radiation therapy, tracer techniques and examples; review of literature.

290. Seminar. (1-3) I and II. The Staff (Mr. J. H. Lawrence in charge)  
 Advanced study in various fields of medical physics. Topics will vary from year to year. The program for 1954-1955 will probably include seminars in (g) Biological Effects of Radiation (II, Dobson and Mortimer); (i) Biophysics of Large Molecules (I and II, Gofman); (l) Radiation Effects at the Molecular Level (II, Garrison); (n) Theoretical Biophysics (I and II, Wijsman); (p) Progress in Biophysics (I, Mortimer and Roberts); (q) Physiology of Circulation (I, Jones and Dobson).
299. Research: Medical Physics and Biophysics. (1-6) I and II.  
 The Staff (Mr. Jones in charge)

RELATED COURSES IN OTHER DEPARTMENTS

- Elastic Waves. (See Geology 204A-204B.)  
 Advanced Seismometry. (See Geology 217.)  
 Radiation Physiology. (See Physiology 108.)  
 Physical Biochemistry. (See Biochemistry 206A-206B.)

**PHYSIOLOGICAL CHEMISTRY**

A Department of the School of Medicine (See Biochemistry, page 42.)

**PHYSIOLOGY**

A Department of the School of Medicine

(Department Office, 2549 Life Sciences Building)

- Leslie L. Bennett, M.D., Ph.D., *Professor of Physiology (Chairman of the Department)*.  
 I. Lyon Chaikoff, M.D., Ph.D., *Professor of Physiology*.  
 Sherburne F. Cook, Ph.D., *Professor of Physiology and Lecturer in Optometry*.  
 Hardin B. Jones, Ph.D., *Professor of Physiology and Medical Physics*.  
 James M. D. Olmsted, Ph.D., Sc.D., *Professor of Physiology, Emeritus*.  
 Benjamin Libet, Ph.D., *Associate Professor of Physiology*.  
 Nello Pace, Ph.D., *Associate Professor of Physiology*.  
 Ralph H. Kellogg, M.D., Ph.D., *Assistant Professor of Physiology*.  
 Adrienne A. Batts, M.D., Ph.D., *Associate in Physiology*.



- Spencer W. Brown, Ph.D., *Associate Professor of Genetics and Lecturer in Physiology*.  
 Ernest L. Dobson, Ph.D., *Lecturer in Physiology*.  
 Ellsworth C. Dougherty, Ph.D., M.D., *Lecturer in Physiology*.  
 Dorothy H. Eichorn, Ph.D., *Lecturer in Physiology for the fall semester*.  
 Harold T. Gordon, Ph.D., *Lecturer in Physiology and Lecturer in Entomology*.  
 Gordon L. Walls, Sc.D., *Lecturer in Physiology and Professor of Physiological Optics and Optometry*.

*Letters and Science List.*—All undergraduate courses in physiology are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Kellogg.

*Preparation for the Major.*—Required: course 1-1L (5) or Zoology 1A-1B (8); Physics 2A-2B (6); Chemistry 1A-1B (10); 5 (3), 8 (3); Mathematics 3A-3B or 16A-16B. Recommended: Anatomy 102; Chemistry 109; and a reading knowledge of French and German.

*The Major.*—The major must include courses 100A–100B (6), 110A–110B (6), 112 (3); of the remaining 9 units necessary to complete the required 24, at least 6 units must be selected from other upper division courses in physiology; 3 units may be selected from upper division courses in related departments, subject to the approval of the major adviser.

Students will be required to have at least a 1.5 grade-point average in courses taken to satisfy the major requirements in physiology.

For fees charged in the School of Medicine, see the ANNOUNCEMENT OF THE SCHOOL OF MEDICINE.

#### LOWER DIVISION COURSES

1. Introductory Physiology. Lectures. (3) I. Mr. Cook  
Prerequisite: either high school chemistry or at least 4 units of college physics or biology. Not open to entering freshmen.
- 1L. Introductory Physiology. Laboratory. (2) I. Mr. Cook  
Prerequisite: course 1 (may be taken concurrently).  
Each laboratory section will be limited to ninety students.

#### UPPER DIVISION COURSES

- 100A–100B. General Physiology. (3–3) Yr. Mr. Pace  
Prerequisite: Chemistry 1A–1B, 8; Physics 2A–2B; course 1–1L, or Zoölogy 1A–1B, or Botany 1. Recommended: Mathematics 3A–3B or 16A–16B.  
Lectures on the chemical, mathematical, and physical characteristics of the life process with particular reference to the cell.
- 101M. Human Physiology. (8) II. Mr. Bennett, Mr. Chaikoff, Mr. Libet, Mr. Kellogg, Mrs. Batts, and Assistants  
Lectures, laboratory, and conferences or demonstrations.  
Prescribed for, and limited to, students in the first year of the School of Medicine. (See ANNOUNCEMENT OF THE SCHOOL OF MEDICINE for statement concerning fees.)
102. Physiology of Growth and Development in the Child. (2) I. Mrs. Eichorn  
Prerequisite: course I, or Zoölogy 1A–1B, or the equivalent.  
Lectures on the physiological changes taking place during development of the child, including those occurring *in utero*, at birth, during growth, and at puberty. The influence of heredity, congenital defects, nutrition, and other factors on growth and development will also be discussed.
104. Physiology of the Endocrines. (2) I. Mr. Chaikoff  
Prerequisite: course 1–1L or Zoölogy 1A–1B, or consent of instructor.  
Not open to students who have taken course 110B.
- \*106. History of Human Physiology. (2) I. \_\_\_\_\_  
Lecture and reports.  
Prerequisite: upper division standing and a laboratory course in one of the following: physiology, biochemistry, anatomy, zoölogy.
107. Environmental Physiology. (3) II. Mr. Pace, Mr. Cook  
Prerequisite: course 1, or Zoölogy 1A–1B, or consent of instructor.  
Lectures on the physical, chemical, and biotic influences of the environment on man, and the adaptive changes in response to environment.
108. Radiation Physiology. (3) II. Mr. Jones, Mr. Dobson  
Prerequisite: Chemistry 1A–1B, Physics 2A–2B, and course 1–1L, or Zoölogy 1A–1B.  
Lectures on the physiological effects of radiation.

\* Not to be given, 1954–1955.

- 110A-110B. Mammalian Physiology. (3-3) Yr.  
Mr. Bennett, Mr. Chaikoff, Mr. Libet, Mr. Kellogg, Mrs. Batts  
Prerequisite: course 1-1L or Zoölogy 1A-1B, Physics 2A-2B, Chemistry 1A, 8.  
A comprehensive survey of mammalian physiology.
112. Mammalian Physiology. Laboratory. (3) II.  
Mr. Bennett, Mr. Chaikoff, Mr. Libet, Mr. Kellogg,  
Mrs. Batts, and Assistants  
Prerequisite: course 110A-110B (may be taken concurrently).  
Course 112 covers the laboratory work of course 101M and is limited to twenty-five students.
115. Morphology and Physiology of the Visual System. (4) I.  
Lectures and laboratory. Mr. Walls, Mr. Cook  
Prerequisite: course 1-1L or Zoölogy 1A.  
Open to students in the School of Optometry and to others with consent of instructor.
- 120A. Comparative Physiology. (3) I. Mr. Cook  
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1-1L or Zoölogy 1A-1B.  
A survey of the muscular, nervous, and sensory systems of animals in general from the comparative point of view.
- 120B. Comparative Physiology. (3) II. Mr. Cook  
Prerequisite: the same as for 120A.  
Circulation, respiration, and blood.
- \*120C. Comparative Physiology. (3) II. Mr. Cook  
Prerequisite: the same as for 120A.  
Digestion, metabolism, the endocrines, and excretion.
199. Special Study for Advanced Undergraduates. (1-4) I and II.  
Mr. Bennett (in charge), Mr. Chaikoff, Mr. Cook,  
Mr. Pace, Mr. Libet, and Mr. Kellogg  
Prerequisite: at least 6 units of upper division courses in physiology.

## GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 10)
200. Seminar in Cell Physiology. (1) II. Mr. Pace  
Prerequisite: courses 100A-100B and Chemistry 109.  
Topics will vary from year to year, and emphasis will be placed on the current literature.
- 201A-201B. Research. (2-8; 2-8) Yr.  
Mr. Bennett (in charge), Mr. Chaikoff, Mr. Cook,  
Mr. Pace, Mr. Libet, Mr. Kellogg
- 203A-203B. Seminar in Physiology. (1-1) Yr. Mr. Kellogg  
Designed to give students an acquaintance with recent physiological literature, and practice in making reports.
204. Seminar in the Endocrines. (1-3) I. Mr. Chaikoff
205. Physiological Evolution. (2) I.  
Mr. Dougherty, Mr. Brown, Mr. Gordon  
Lectures on the evolution of physiological systems in the different

groups of organisms, including a consideration of the genetic background for evolutionary mechanisms and the genetic control of physiological processes.

207. Seminar in Environmental Physiology. (1) I and II.  
Prerequisite: courses 107 and 110A-100B. Mr. Cook, Mr. Pace  
Topics will vary from year to year. The program for 1954-1955 will be announced.
220. Seminar in Comparative Physiology. (1) I. Mr. Cook  
Prerequisite: courses 110A-110B and consent of instructor.  
The topic for 1954-1955 will be announced.

## PLANT BIOCHEMISTRY

A Department of the College of Agriculture (See Biochemistry, page 41.)

### PLANT NUTRITION

(Department Office, 3044 Life Sciences Building)

- Daniel I. Arnon, Ph.D., *Professor of Plant Physiology.*  
Perry R. Stout, Ph.D., *Professor of Plant Nutrition (Chairman of the Department).*  
James P. Bennett, Ph.D., *Professor of Plant Physiology, Emeritus.*  
John S. Burd, B.S., *Professor of Plant Nutrition, Emeritus.*  
Walter H. Dore, B.S., *Professor of Plant Nutrition, Emeritus.*  
Louis Jacobson, Ph.D., *Associate Professor of Plant Nutrition.*
- ◊
- Geoffrey B. Bodman, Ph.D., *Professor of Soil Physics.*  
Hans Jenny, Sc.D., *Professor of Soil Chemistry and Morphology.*  
Gordon Mackinney, Ph.D., *Professor of Food Technology.*  
Roy Overstreet, Ph.D., *Professor of Soil Chemistry.*  
Leonard Machlis, Ph.D., *Associate Professor of Botany.*  
Edward C. Stone, Ph.D., *Assistant Professor of Forestry.*  
John G. Torrey, Ph.D., *Assistant Professor of Botany.*
- ◊
- Theodore C. Broyer, B.S., *Lecturer in Plant Nutrition.*  
Albert Ulrich, Ph.D., *Lecturer in Plant Nutrition.*

*Letters and Science List.*—Courses 115 and 117 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

#### UPPER DIVISION COURSES

115. The Nutrition of Green Plants. (2) I. Mr. Arnon  
Prerequisite: Botany 111.  
Evolution of modern concepts of plant nutrition; absorption, accumulation, assimilation, and functional aspects of inorganic nutrients; special phases of photosynthesis; nitrogen metabolism; effects of hydrogen ion; deficiency and toxicity diseases; certain relations of plant nutrition to animal nutrition.
117. The Nutrition of Green Plants Laboratory. (2) I. Mr. Jacobson  
Prerequisite: Chemistry 5; course 115 (taken concurrently if possible).  
Laboratory and greenhouse experiments in plant nutrition to accompany course 115.

199. Special Study for Advanced Undergraduates. (1-5) I and II.  
Mr. Stout (in charge), Mr. Arnon, Mr. Bodman,  
Mr. Jacobson, Mr. Jenny, Mr. Overstreet  
Prerequisite: senior standing and consent of the student's major adviser.

## RELATED COURSES

- The Soil as a Medium for Plant Growth. (See Soil Science 110.)  
Soil Chemistry in Relation to Plant Growth. (See Soil Science 112 and 113.)

## GRADUATE COURSES

- 201A-201B. Research. (1-9; 1-9) Yr.  
Mr. Arnon, Mr. Bodman, Mr. Jacobson,  
Mr. Jenny, Mr. Overstreet, Mr. Stout  
Prerequisite: graduate standing and consent of instructor.  
Research on problems of plant nutrition and plant physiology.
206. Seminar in Plant Physiology. (1) I.  
Mr. Overstreet (in charge), Mr. Arnon, Mr. Jacobson, Mr. Machlis,  
Mr. Mackinney, Mr. Stone, Mr. Stout, Mr. Torrey  
Prerequisite: graduate standing and consent of the staff member in charge.  
Seminar in problems of plant physiology in the fields of botany, food technology, forestry, plant nutrition, and soil science.  
The spring semester of this seminar is listed under Botany 206.
- 235A-235B. Staff Seminar in Plant Nutrition. (No credit) Yr.  
The Staff (Mr. Arnon in charge)
- \*280. Chemistry of Plant Growth. (2) I.  
Prerequisite: Chemistry 1A, 1B, 8; Biochemistry 102; Botany 160B.  
Recent advances in knowledge of biochemical mechanisms influencing plant growth; chemistry of plant growth substances and their physiological effects on plants; correlation of chemical changes accompanying growth; methods of research.

## PLANT PATHOLOGY

(Department Office, 145 Hilgard Hall)

- Peter A. Ark, Ph.D., *Professor of Plant Pathology.*  
Max W. Gardner, Ph.D., D.Sc. (hon.c.), *Professor of Plant Pathology.*  
Hans N. Hansen, Ph.D., *Professor of Plant Pathology.*  
James B. Kendrick, Sr., Ph.D., *Professor of Plant Pathology, Davis (Chairman of the Department).*  
Thomas E. Rawlins, Ph.D., *Professor of Plant Pathology.*  
William C. Snyder, Ph.D., *Professor of Plant Pathology.*  
Harvey E. Thomas, Ph.D., *Professor of Plant Pathology.*  
Cecil E. Yarwood, Ph.D., *Professor of Plant Pathology.*  
James T. Barrett, Ph.D., *Professor of Plant Pathology, Emeritus.*  
William N. Takahashi, Ph.D., *Associate Professor of Plant Pathology.*  
Robert D. Raabe, Ph.D., *Assistant Professor of Plant Pathology.*  
Stephen Wilhelm, Ph.D., *Assistant Professor of Plant Pathology.*  
David E. Schlegel, Ph.D., *Instructor in Plant Pathology.*



- A. Herbert Gold, Ph.D., *Lecturer in Plant Pathology.*  
Leo J. Klotz, Ph.D., *Professor of Plant Pathology, Ewerside.*

\* Not to be given, 1954-1955.

*Departmental Major Adviser.*—Mr. Rawlins.

*Preparation for the Major.*—See Plant Science curriculum, College of Agriculture, page 85, in the CIRCULAR OF INFORMATION. Zoölogy 1A or 10 and Soil Science 100, 110, or 106 must be included.

*The Major.*—Required: twelve units of Plant Pathology in addition to Plant Pathology 120. In satisfaction of part of this 12-unit requirement, related courses approved by the adviser may be accepted.

## UPPER DIVISION COURSES

100. Forest Pathology. (3) II. Mr. Hansen  
Lectures and laboratory.  
Prerequisite: Botany 1 or 12 and 16. Restricted to forestry students.  
Diseases of forest plants.
120. Plant Diseases. (4) I. Mr. Yarwood, Mr. Raabe  
Lectures and laboratory.  
Prerequisite: Botany 1 or 12 and 16. Recommended: Bacteriology 1.  
A general course on the nature, cause, and control of plant diseases.
121. Technique of Plant Histochemistry and Virology. (3) II.  
Mr. Rawlins, Mr. Gold, Mr. Takahashi, Mr. Schlegel  
Prerequisite: course 120.  
Application of histochemical methods to the study of diseased plant tissues; photography; virus techniques.  
Given in the spring semester of odd-numbered years.
122. Plant Pathology Methods. (3) II. Mr. Ark  
Prerequisite: course 120.  
The laboratory methods and techniques used in the study of plant diseases.
123. Principles of Plant Pathology. (3) II. Mr. Wilhelm, Mr. Thomas  
Prerequisite: course 120.  
A consideration of some of the principles broadly applicable to fungus, bacterial, virus, and nutritional diseases of plants.
- 125A. Diseases of Crop Plants. (3) I. Mr. Snyder, Mr. Gardner  
Lectures and laboratory.  
Prerequisite: course 120.  
The pathology of field and vegetable crops. Diagnosis, host reaction, factors influencing inception and severity of disease, etiology, dissemination and control.  
Given in the fall semester of even-numbered years.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Rawlins in charge)

## GRADUATE COURSES

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr. Mr. Gold
- 230A-230B. Research in Plant Pathology. (1-9; 1-9) Yr.  
The Staff (Mr. Gardner in charge)

(GIVEN AT RIVERSIDE)

## GRADUATE COURSES

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr.  
The Staff (Mr. Klotz in charge)
- 230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr. Mr. Klotz

## POLITICAL SCIENCE

(Department Office, 202 South Hall)

- Charles Aikin, LL.B., Ph.D., *Professor of Political Science.*  
 Eric C. Bellquist, Ph.D., *Professor of Political Science.*  
 Thomas C. Blaisdell, Jr., Ph.D., *Professor of Political Science and Director of the Bureau of International Relations.*  
 Joseph P. Harris, Ph.D., *Professor of Political Science.*  
 Albert Lepawsky, Ph.D., *Professor of Political Science.*  
 Leslie Lipson, Ph.D., *Professor of Political Science.*  
 Austin F. Macdonald, Ph.D., *Professor of Political Science.*  
 Samuel C. May, M.A., LL.B., *Professor of Political Science and Director of the Bureau of Public Administration.*  
 Peter H. Odegard, Ph.D., *Professor of Political Science (Chairman of the Department).*  
 † Julian Towster, J.D., Ph.D., *Professor of Political Science.*  
 C. Dwight Waldo, Ph.D., *Professor of Political Science.*  
 David P. Barrows, Ph.D., LL.D., Litt.D., *Professor of Political Science, Emeritus.*  
 Hans Kelsen, Ph.D., *Professor of Political Science, Emeritus.*  
 P. Orman Ray, Ph.D., LL.D., *Professor of Political Science, Emeritus.*  
 Frank M. Russell, Ph.D., *Professor of Political Science, Emeritus.*  
 George Lenczowski, J.D., *Associate Professor of Political Science.*  
 N. Wing Mah, Ph.D., *Associate Professor of Political Science.*  
 Robert A. Scalapino, Ph.D., *Associate Professor of Political Science.*  
 \* Eugene L. Burdick, Ph.D., *Assistant Professor of Political Science.*  
 Ernst B. Haas, Ph.D., *Assistant Professor of Political Science.*  
 \* Norman Jacobson, Ph.D., *Assistant Professor of Political Science.*  
 Richard L. Park, Ph.D., *Assistant Professor of Political Science.*  
 Victor Rosenblum, Ph.D., *Assistant Professor of Political Science.*  
 Paul Seabury, Ph.D., *Assistant Professor of Political Science.*  
 Sheldon Wolin, Ph.D., *Assistant Professor of Political Science.*



- Hannah Arendt (Hannah Arendt Bluecher), Ph.D., *Visiting Professor of Political Science.*  
 Joan Bondurant, Ph.D., *Lecturer in Political Science.*  
 Hugh M. Clokie, Ph.D., *Lecturer in Political Science.*  
 Julian R. Friedman, M.A., *Lecturer in Political Science.*  
 William H. Gardner, Ph.D., *Lecturer in Political Science.*  
 Boynton S. Kaiser, A.B., *Lecturer in Political Science.*  
 Adrienne Koch, Ph.D., *Visiting Associate Professor of Political Science.*  
 Leslie G. McConnell, Jr., Ph.D., *Lecturer in Political Science.*  
 Frederick C. Mosher, Ph.D., *Visiting Professor of Political Science.*  
 Lawrence Preuss, Ph.D., *Visiting Professor of Political Science.*  
 Joseph W. Rupley, B.S., *Lecturer in Political Science for the fall semester.*

*Letters and Science List.*—All undergraduate courses in political science except course 183 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

\* Absent on leave, 1954-1955.

† Sabbatical leave in residence, fall semester, 1954-1955.



*The American Institutions requirement* may be satisfied by completing any one of the following courses in political science: 1, 100A, 101A, 102A, 104A, 105A, 157A, 157B, 163.

*Departmental Major Advisers:* Mr. Aikin, Mr. Haas, Mr. Lenczowski, Mr. Lipson, Mr. Macdonald, Mr. Mah, Mr. May, Mr. Scalapino, Mr. Seabury, Mr. Waldo.

*Preparation for the Major.*—Students may be accepted in the major if they have at least a C average in the prerequisite courses, namely, Political Science 1 and 2, Economics 1A–1B, and one of the following History courses: 4A–4B, 17A–17B. Students whose major field of undergraduate concentration will be in Group VI (Parties, Pressure Groups, and Public Opinion) or Group VII (Public Administration and Public Policy), or who wish to take a graduate degree, will be required to take a course in statistics approved by their departmental adviser. In addition, majors are strongly recommended to study allied subjects in the social sciences, and to that end are advised to include in the program of their freshman and sophomore years some of the following lower division courses: Anthropology 2A–2B; Geography 5A–5B; History 8A–8B; Philosophy 6A–6B; Psychology 1A; Sociology and Social Institutions 1, 2. Students who were accepted as majors under the plan in force until the year 1952–1953 will be permitted to continue with their programs as then approved.

*Fields of Study.*—Courses in the Department are grouped into the following fields: I. American Government; II. Political Theory; III. International Relations; IV. Comparative Government; V. Public Law and Jurisprudence; VI. Public Opinion, Parties, and Pressure Groups; VII. Public Administration and Public Policy. A major is required to select one of these for special emphasis.

*The Major.*—Candidates' programs must be submitted to a departmental adviser for approval. The department will certify to the completion of a major program for graduation upon fulfillment of the following requirements:

1. Completion of at least 24 units of upper division courses in the major, of which 18 units must be in political science. Six (6) upper division units taken in other departments may be accepted as a part of the major, provided they are related to the candidate's field of emphasis and have been approved by his departmental adviser.
2. Majors in the Department will include in their programs, normally in the junior year, four courses, one each from any four groups in the following list including the group emphasized:
  - I. 101A, 102A
  - II. 110A
  - III. 120A, 120B
  - IV. 141A, 141B, 144A
  - V. 150A, 157A, 157B
  - VI. 162A, 163
  - VII. 181, 184

3. Students in Political Science must maintain a C average in the major.

*Special Study Course.*—In the senior year, students who have shown high attainment may pursue a systematic scheme of reading under the direction of some member of the Department. The maximum credit for this course (199) will usually not exceed 4 units in any semester.

#### LOWER DIVISION COURSES

1. Introduction to Government. (3) I and II. Mr. Odegard, Mr. Rosenblum  
Two lectures and two section meetings per week.  
An introduction to the principles and problems of government, with

particular emphasis on national government in the United States. This course is accepted in satisfaction of the American Institutions requirement.

2. Introduction to Government (Comparative Government). (3) I and II.  
Two lectures and two section meetings per week. Mr. Lipson  
A comparative study of constitutional principles, governmental institutions, and political problems of selected national governments.

#### UPPER DIVISION COURSES

Nonmajors who plan to take upper division courses in political science are strongly advised to take courses 1 and 2. Lacking these, students with satisfactory equivalents may be admitted to upper division courses with consent of the instructor.

Courses which are given the same number followed by letters "A," "B," "C," etc., may be taken independently unless otherwise indicated.

#### Group I—American Government

(Other courses in American Government, listed in other Groups, may also be regarded as belonging to Group I for the purposes of the program of the major: namely, 113, 128A, 128B, 157A, 157B, 158, 159, 175.)

- 100A. Government in the United States. (3) I. Mr. McConnell  
(Formerly numbered 150.)  
Not open to students who have taken course 1 or 151 (as formerly numbered).  
A survey of the powers, structure, and operation of government at national, state, and local levels.
- 101A. Basic Factors in American Politics. (3) I. Mr. Waldo  
(Formerly numbered 159.)  
The constitutional-legal background of American political action; historical, social, and ideological factors affecting American politics; the politics of economic interests and geographical areas; emergent political patterns in the two-party system.
102. State Government and Administration. (3) II. Mr. Macdonald  
(Formerly numbered 172.)  
Organization of state government; federal-state relations; elections and politics; the courts; county government; current administrative problems such as state finance, the merit system, regulation of business, the state and labor, conservation of natural resources, health, welfare, correction.
- 103A. Municipal Government and Administration. (3) I. Mr. Macdonald  
(Formerly numbered 162.)  
How cities are organized and what they are doing; municipal politics; relations of city and state; problems and activities of modern cities; traffic regulation, city and regional planning, zoning, police and fire protection, budget making; the war against crime.
- 104A. State and Local Government in California. (3) II. Mr. McConnell  
An examination of the constitution; legislative, administrative, judicial and electoral system of California; parties and interest groups; city and county government; California in national politics.

## 105A. The Legislative Process. (3) II.

Mr. Harris

(Formerly numbered 154.)

A study of the organization and functioning of legislative bodies, with particular attention to Congress and state legislatures, functions; membership; committee system; executive-legislative relations; pressure groups; lobbying; movement for reform.

**Group II—Political Theory**

## 110A. Contemporary Issues and Political Theory. (3) I and II.

Mr. Wolin, Miss Arendt

An examination of current trends which illuminate the structure of modern society, and an inquiry into the theoretical aspects of controversial political issues including some of the main concepts of liberal democracy in the light of recent criticism.

## 111A. Principles of Political Theory. (3) II.

Miss Koch

(Formerly numbered 111.)

An analytical approach to problems of citizenship and authority from the standpoint of the individual, the group, and the state.

## 113. American Political Theory. (3) I.

Miss Koch

Basic problems of political theory as viewed within the context of American history and institutions.

## 115A. Development of Political Thought in Asia. (3) II.

(Formerly numbered 122.)

Mr. Scalapino, Mr. Park

Analysis of the political thought of South and Southeast Asia and the Far East, with particular attention to China, Japan, and India; an historical survey of traditional and modern thought in Asia, leading to a discussion of contemporary issues. Emphasis: the Western impact, nationalist movements, current ideological trends.

## \*116A. Soviet Political Theory. (3) I.

Mr. Towster

(Formerly numbered 108.)

Analysis of Soviet political theory. Class conflict and dictatorship. Evolution of views on state, the nationality problem, sovereignty, and related concepts. Bureaucracy and democracy in theory and in the reality of Soviet public life.

## 118A-118B. History of Political Theory. (3-3) Yr. Mr. Wolin, Miss Arendt

I: 118A, Mr. Wolin. II: 118B, Miss Arendt

Man as a political animal as viewed by Machiavelli, Hobbes, Spinoza, Locke, Montesquieu, Rousseau, Kant, Tocqueville, Hegel, Marx.

**Group III—International Relations**

## 120A-120B. Elements of International Relations. (3-3) Yr.

120A: The International Society.

Mr. Haas, Mr. Seabury

Analysis of ideological, legal, military, and economic factors creating harmony and hostility among nations. Development of international institutions reflecting and molding such factors. Not open to students who have had course 123 or 124.

120B: National Foreign Policies.

Factors—political, economic, cultural, and geographic—shaping the foreign policies of nation-states, with emphasis on the Great Powers.

\* Not to be given, 1954-1955.

- 121A. National Security and Foreign Policy. (3) I. Mr. Blaisdell  
Development of strategic concepts; utilization of manpower resources; impact of major weapons, i.e., tank, battleship, airplane, electronic and nuclear weapons; economic potential in relation to national power; international trade and autarchy; place of propaganda and diplomacy.
124. International Organization. (3) II. Mr. Haas  
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.
127. Theories of International Relations. (3) II. \_\_\_\_\_  
Historical development and present range of political thought on relations between nations; origins and implications of the idea of sovereignty; the theory of an international community; theories of imperialism; Christian, Communist, and Fascist ideas; geopolitical theories.
- 128A. Concepts in American Foreign Policy. (3) I. Mr. Seabury  
(Formerly numbered 128.)  
Analysis of competing concepts of the American "national interest" operative since World War I: Wilsonianism, isolationism, the Open Door, the Monroe Doctrine, and the Good Neighbor Policy; continentalism; national security, containment and liberation; their relation to substantive policies, and the character of American democracy.
- 128B. The Conduct of American Foreign Relations. (3) II. Mr. Bellquist  
(Formerly numbered 175.)  
Diplomacy and the conduct and control of foreign relations. The Department of State and the Foreign Service. Case studies in recent diplomacy to illustrate policy formation and execution. Some comparative materials will be introduced but emphasis will be placed upon the United States.
129. Nationalism and Imperialism. (3) II. Mr. Haas  
The growth of national consciousness in selected European countries. Ideological content of various national belief systems and their development into imperialism. Colonial rule and the growth of new nationalisms as the older doctrines diminish in intensity.
- 130A. The Conduct and Control of Foreign Relations. (3) II. Mr. Seabury  
Comparative study of several selected significant modern states—the United States, the Soviet Union, France, Germany, and Great Britain—to examine the institutions and processes and constitutional aspects of "decision-making" in foreign relations, under democratic, oligarchic, and totalitarian systems.
- 131A. Soviet Foreign Policy. (3) II. Mr. Towster  
(Formerly numbered 142.)  
The constant factors in Russian foreign policy. Policy of the early years as affected by Marxian ideology, internal conditions, and foreign interference. Period of truce and limited cooperation with the Western Powers. Effect of the breakdown of the League. The Second World War and aftermath.

- 133A-133B. Principles of International Law. (3-3) Yr. Mr. Preuss  
The nature and sources of international law, its historical development, and its scope and function as a part of the contemporary legal system.
- 136A. Latin America in World Affairs. (3) II. Mr. Macdonald  
(Formerly numbered 149.)  
Relations of Latin America with the United States and other world powers. Pan-Americanism and its relation to world organization. The future of Latin America in the community of nations.
- 137A. International Relations in the Middle East. (3) I. Mr. Lenczowski  
(Formerly numbered 189.)  
A study of politics and diplomacy of eleven independent states in the Middle East. Emphasis is laid on the interrelation of foreign and domestic politics.
- 137B. Basic Strategic and Political Problems in the Middle East. (3) II. Mr. Lenczowski  
An analysis of those problems which transcend the limits of single countries, such as the position of the Middle East in world strategy and economics; supranational political movements; political concepts, techniques, and propaganda of major powers; global and regional security arrangements; and the role of international agencies in the area.
- 138A-138B. International Relations in the Far East. (3-3) Yr. Mr. Mah  
It is strongly recommended that Part A be taken before Part B.  
138A. A general survey to provide an essential background for the understanding of contemporary political events and developments in the area. (Formerly numbered 138.)  
138B. An analysis of political issues of world significance and ramifications posed by the conflict of interests of the powers in the area. (Formerly numbered 136.)
- \*138C. India and Pakistan in World Affairs. (3) I. Mr. Park  
Policies of India and Pakistan in relation to each other, as members of the British Commonwealth, and of the United Nations. Their relations with the Great Powers.
- \*138D. Nationalism and Diplomacy in the Far East. (3) II. ———  
(Formerly numbered 194.)  
East Asian trade, investment, and diplomacy in the modern era. Rise of modern national states: Japan, China, Korea, and Southeast Asia. End-of-the-century diplomatic rivalries. The two World Wars. Economics and politics of twentieth-century Eastern nationalism. Postwar developments.
- 138E. International Relations: the Southeast Asia Region. (3) I. Mr. Scalapino  
A study of the regional and international relations of the Southeast Asian societies: emphasis will be placed on twentieth-century developments with such topics as neutralism, policy toward other Asian communities, and relations with the United States receiving special attention.
- 139A. International Relations of Western Europe and the Atlantic Region. (3) I. Mr. Haas  
Analysis of the foreign policy aims of significant Western European groups and parties, and their impact on the emergence of a United Europe. Influence of American and Soviet policy on European events and the integration of the Atlantic Area.

**Group IV—Comparative Government**

- 141A\*–141B. Government in the Soviet Union. (3–3) Yr. Mr. Towster  
Demographic, historical, and ideological bases of Soviet rule. The social and governmental structure. Nationalities and federalism. The Party. Trade unions and cooperatives. The church; army; courts, prosecutors and organs of police. Statics and dynamics of power in the U.S.S.R.
- \*141C. Government and Politics in Eastern Europe. (3) II. Mr. Towster  
(Formerly numbered 130.)  
The origins and nature of the present social and ethnic structures, governmental systems, and international position of the East European satellites. Primary emphasis upon the political evolution and status of the Soviet satellites.
- 142A. Government and Politics in the Middle East. (3) I. Mr. Lenczowski  
(Formerly numbered 188.)  
A study of political institutions, traditions, and mores of the people of the Middle East in their geographical and cultural setting.
- 142B. Government and Politics in South Asia. (3) I. Miss Bondurant  
The interrelation of nationalism and imperial policy in the independence movements in India, Pakistan, and Ceylon; constitutional development; the formation of Pakistan and its consequences for South Asia; nationalist thought and institutions.
- 142C. Government and Politics in South Asia. (3) II. Miss Bondurant  
The theory and practice of parliamentary government in India, Pakistan, and Ceylon; political parties, constitutional law, economic planning, legislation; an evaluation of the institutional impact of British rule.
- 142D–142E. Political Institutions in Africa South of the Sahara. (3–3) Yr.  
Mr. Friedman  
142D. Survey and analysis of indigenous African political institutions and of the problems of the Africans in tribes, villages, towns, and cities. European influence on African ways of life examined.  
142E. British statecraft in Africa: nation-building, economic development, social progress, Dominion-colony relations, and international questions. Comparison with French, Portuguese, and South African colonial statecraft. (Formerly numbered 197.)
- 142F. Evolution and Revolution in the Middle East. (3) II. Mr. Lenczowski  
A study of the transformation of the traditional Moslem society into a modern society; the impact of democratic, Fascist, and Communist ideologies on the political attitudes in the area; liberal and anti-liberal trends in contemporary Islam; and a review of principal revolutionary experiments in the Middle East.
- 143A–143B. Comparative Government in East Asia. (3–3) Yr.  
(Formerly numbered 132A–132B.) Mr. Scalapino  
A survey of basic political, economic, social factors which determine the nature of the Far East Societies. Approximately equal time will be devoted to Japan, China, and Southeast Asia, with emphasis on twentieth-century development.

\* Not to be given, 1954–1955.

- 143C-143D. Government and Politics in China. (3) II. Mr. Mah  
 143C. China as a nation in the Oriental world; impact of the Occident and its repercussions; internal and external aspects of the struggle for the creation of a modern democratic state; China in world politics. (Formerly numbered 135.)  
 143D. China from Monarchy to Republic. China's republican experiment, its problems, failures, and successes. China's internal politics and external relations under Communist rule. (Formerly numbered 143C.)
- \*143E. Government, Politics, and External Relations of the Philippines. (3) II.  
 (Formerly numbered 187.)  
 Annexation of the Philippines; political repercussions in the United States and influence on over-all United States Far Eastern policy. Independence movement; Jones Act of 1916; Tydings-McDuffie Act of 1934; formation of the Philippine Commonwealth. Constitution of the Philippines. Impact of the war years. Establishment of the independent Republic of the Philippines (1946). Problems of independence. External relations.
- \*143F. The Problems of Colonialism in the Far East. (3) II. Mr. Mah  
 (Formerly numbered 143D.)
- 144A. Government in Great Britain. (3) I. Mr. Lipson  
 (Formerly numbered 144.)  
 A study of the democratic process in Britain, as it operates through party politics and the machinery of government; the nature of the cabinet system; the functions undertaken by the state; and the gradualist blending of tradition and change.
- 144B. Government in the British Commonwealth. (3) II. Mr. Lipson  
 (Formerly numbered 143.)  
 The evolution of the British Commonwealth and changing status of its members; the internal politics of Australia, Canada, South Africa, and New Zealand: their similarities and differences.
- \*145. Government and Politics in Japan. (3) II. Mr. Scalapino  
 (Formerly numbered 145M.)  
 How Japan is governed, with consideration of major changes in her basic political structure and policies under Allied military occupation.
146. Government and Politics of the Northern European Countries. (3) II.  
 Mr. Bellquist  
 Constitutionalism and parliamentarism in the countries of Northern Europe—Denmark, Finland, Iceland, Norway, and Sweden. Their constitutional history and present governmental systems. Social legislation in Scandinavia; foreign policies; inter-Scandinavian coöperation.
- \*147A. Government and Politics in Western Europe: France and Italy. (3) I.  
 Mr. Seabury  
 A study of the experiments in democracy and the opposition to democracy in two countries sufficiently similar and sufficiently different to provide comparisons and contrasts.
- 147B. Government and Politics in Western Europe: Germany and Switzerland. (3) I. Mr. Seabury  
 A comparative treatment of the political record of two western European communities; the problem of attaining national unity through uni-

formity or diversity, through a federal or unitary state; the nature of party groupings; the causes of the phenomenon of Nazism.

For 1954-1955, emphasis will be placed upon Germany.

148. Governments of Latin America. (3) I. Mr. Macdonald  
Latin-American parties and politics; governmental activities and problems; the structure of government. Emphasis is placed on political realities rather than formal constitutional provisions.

**Group V—Public Law and Jurisprudence**

- 150A. Origins of Legal Institutions. (2) II. Mr. Rosenblum  
(Formerly numbered 100.)  
The development and agencies of legal growth since primitive times and the interrelations between law and government. The early legal institutions of Europe and their influence on the modern juridical systems.

- 150B. Elements of Jurisprudence. (3) I. Mr. Rosenblum  
(Formerly numbered 117.)  
Fundamental legal principles, especially from the analytical, historical, philosophical, and sociological points of view. Particular attention will be given to modern theories of the function of law.

- 151A-151B. Legal Order of a Communist State. (3-2) Yr. \_\_\_\_\_  
151A. Foundations of the social and economic structure of the Soviet Union and its satellites. Soviet legal theory. Functions of law in a classless society. Principles of a People's Democracy. Social structure and its legal basis. Family law. Crime and punishment. Soviet justice. Principles of International Law.

151B. Economic legislation of the Soviet Union and People's democracies. State Socialist property. Personal property and the sphere of economic freedom. Kolkhoses. Labor law. Penalties and rewards as incentives for work. Inheritance law. General appraisal of the universal monopoly of the state.

156. Administrative Law. (3) II. Mr. Aikin  
A study of the position of the executive branch of government in the American constitutional system, of the foundation of administrative power, of the area of judicial supervision of administration, and of the liability of public officers and of the state based on misuse of administrative power.

- 157A-157B. Constitutional Law of the United States. (3-3) Yr. Mr. Aikin  
An examination of the structure of public power in American national, state and local government.

157A. The federal system: expansion of national authority; interstate barriers; separation of powers; admission of states to the Union; interstate compacts; constitutional amendments; treaties.

157B. Rights of individuals; citizenship; suffrage; education; civil liberty; rights of accused; rights in war; slavery.

158. Government and Business. (3) I. Mr. Aikin  
A study of the basis of national and state control of industry and agriculture, and the extent to which government may control competition, maintain prices, protect home industries, prevent waste, establish quality standards, regulate conditions of labor, etc.



159. American Judicial Administration. (3) I. Mr. Rosenblum  
 (Formerly numbered 177.)  
 The organization and operation of American courts. Problems of jurisdiction, staffing, civil and criminal procedure.

**Group VI—Parties, Pressure Groups, and Public Opinion**

- 160A–160B. Pressure Groups and Political Power. (3–3) Yr.  
 (Formerly numbered 140, 160, 163.) Mr. McConnell  
 160A. The Government of the Private Association.  
 An examination of the internal government and politics of the private association. Materials will be drawn from trade unions, the church, agricultural, business, professional, and other organizations. Special attention will be paid to the concepts of majoritarianism, constitutionalism, oligarchy, and constituency.  
 160B. Private Power and Public Policy.  
 The nature and sources, strategy and tactics of group power within the context of the American institutional setting. Business, agriculture, labor, religion, the professions as organized power. Ramifications for a democratic society.
- 161A–161B. Political Behavior. (3–3) Yr. \_\_\_\_\_  
 The individual and group determinants of political belief and action. Political institutions considered in relation to individual values and behavior.
- 162A. Public Opinion. (3) I. Mr. Bellquist  
 (Formerly numbered 114.)  
 An analysis of the nature of public opinion and propaganda in modern society. Major attention given to basic principles of communication and group behavior with emphasis on their political implications at home and abroad.
163. Political Parties. (3) I. Mr. Harris  
 (Formerly numbered 152.)  
 Nature and functions of political parties; their origin, development, structure, economic and social composition, internal management and control; relation of parties and pressure groups to legislation and administration; analysis of pressure politics as distinguished from party politics.
164. Problems in Analysis of Political Behavior. (3) I. \_\_\_\_\_  
 Problems in analysis of voting behavior and other manifestations of public participation in politics. The conceptual tools and the techniques of research used in the analysis of political processes. Problems in the design and execution of research projects.
- \*165. Soviet Propaganda. (3) II. Mr. Towster  
 (Formerly numbered 109.)  
 A critical analysis of the content and role of Soviet propaganda. Government control of the press, radio, and other media of communication. The nature of public opinion in the U.S.S.R. The main themes and stereotypes of internal and external propaganda.

\* Not to be given, 1954–1955.

**Group VII—Public Administration and Public Policy**

175. National Administration in the United States. (3) I. Mr. Lepawsky  
(Formerly numbered 155.)  
History, organization, personnel, business methods, and accomplishments of the departments of the administrative branch of the United States Government, with special reference to the development since 1933.
176. Recent National Policy. (3) II. Mr. Waldo  
An analytical survey of the Federal government's relations to business, agriculture, labor, and the economy as a whole. Transportation, communication, and energy resources policies; and welfare programs. The government's foreign policies and national defense programs are excluded.
180. Administrative Theory. (3) I. Mr. Waldo  
Administration as rational coöperation; development of administration; origins, premises, and techniques of administrative science, and its relations with the various social sciences; administration in relation to its environment; role of public administration in modern society.
181. Principles of Public Administration. (3) I. Mr. May  
Development of public administration and its relation to other branches of government; powers and liabilities of administrative officials; organization for different governmental functions, including line, staff, and auxiliary services, with special reference to budget and personnel administration and administrative planning.
183. Public Personnel Administration. (3) II. Mr. Harris  
A survey of public personnel administration, including the history of civil service, the personnel agency, classification, recruitment, examination techniques, promotion, service ratings, training, discipline, employee organizations, and retirement.
184. Advanced Principles of Public Administration. (3) II. Mr. Lepawsky  
Advanced study of organization, financial administration, planning, overhead management, and the relationships of administration to the legislature, public opinion, and pressure groups.
- 185A-185B. Government Planning. (3-3) Yr. Mr. Lepawsky, Mr. May  
185A. Conservation and development of natural resources.  
185B. Economic and social planning and development.  
An analysis of governmental agencies which conduct research and disseminate information concerning our physical, economic, and human resources, and stimulate, regulate, or control their use through orderly programs of national, regional, local, and international development directed toward optimum utilization and social stability in peace and mobilization for defense.
186. Organization and Management. (3) II. Mr. Mosher  
An analytical examination through case studies of public administrative organization, and the techniques and processes of public management; the growth and significance of the management movement; the organization of administrative authority; the relation of organization to operational processes.

**GRADUATE INSTRUCTION**

Admission to graduate work is limited to graduate students who have adequate undergraduate course preparation to participate in and benefit from such work. Admission to graduate courses or seminars is at the discretion of the instructor. See also page 10.

Unless otherwise stated, the first half (A) of any course or seminar is not prerequisite to the second half (B).

## GRADUATE COURSES

- \*201. Concepts of Political Philosophy. (2) I. \_\_\_\_\_  
 A review of philosophical method as it bears on the study of politics. Scientific method in the social sciences, nature of proof, value systems will be studied.
- 209A-\*209B. European Political Thought in the Nineteenth Century. (2-2) Yr. Mr. Wolin  
 An examination of the principal themes of political thought in England and on the Continent from the French Revolution to World War I. Special emphasis will be placed on the development of modern conservative thought.
- 230A. International Relations. (2) I. Mr. Seabury  
 (Formerly numbered 232A.)  
 The bases of international relations in conflicting ideologies and philosophies. Special problems; imperialism, demogogy, economic relations, regionalism, military, and geographic factors.
- \*240. Recent Indian Political Thought. (2) II. Mr. Park  
 A study of modern Indian political and nationalist thought, with special reference to the influence of European ideas. Emphasis will be given to the contributions of Tilak, Gokhale, Aurobindo, Sapru, Tagore, Gandhi, J. Nehru, Subhas Bose, S. P. Mookerjee, J. P. Narayan, and M. N. Roy.
243. Problems of Comparative Government. (2) I. Mr. Lipson  
 An inquiry at an advanced level into the comparative study of politics and institutions, with emphasis upon the economic, geographic, cultural, and historical context within which the state operates.
- 261A-261B. Municipal Administration. (2-2) Yr. Mr. May, Mr. Gardner  
 Techniques of municipal administration, with emphasis on the function, tools, and skills of management. Consideration of factors influencing the administrative process. Synthesis of theory and practice.
- 281A-281B. Public Administration. (2-2) Yr. Mr. Harris, Mr. Lepawsky  
 An advanced study of the theory and practice of public administration, with special emphasis upon the decision-making process and the relation of administration to public policy formation.

## GRADUATE SEMINARS

200. Bibliography and Research Methods in Political Science. (2) I. \_\_\_\_\_  
 Mr. May  
 Governmental research as a focal point in the formulation of public policy and the utilization of existing information through the various social science disciplines.
- \*205. Research in American Government. (2) II. Mr. Harris
211. American Political Theory. (2) II. Miss Koch  
 Basic problems of political theory will be examined within the context of American political development.
- 212A\*-212B. European Political Theory. (2-2) Yr. Miss Arendt  
 Significance and techniques of totalitarianism. Examination of European nihilism and 19th-century ideologies; imperialism and the nation-state; class- and mass-society; class and national dictatorships; state and party; secret police and concentration camps; totalitarian ideology and total terror.

\* Not to be given, 1954-1955.

- \*214. The Scope and Method of Political Science. (2) II. \_\_\_\_\_  
 Politics as one among the social sciences. Contributions of history, anthropology, economics, and sociology as methods to the development of a science of politics.
224. Public Opinion. (2) I. \_\_\_\_\_
226. Comparative Party Systems. (2) I. Mr. Clokie  
 The origin of political parties, with special reference to Britain; significance of party for constitutional and democratic government; experience with single-party dictatorship and coalitions; the peculiarities of the two-party system, past and present; trends in political thought about party government.
- 228A-228B. Russian and Soviet Law. (2-2) Yr. \_\_\_\_\_  
 Systematic study of the Soviet Constitution and the constitutions of the People's democracies. Conferences on particular problems of pre-revolutionary Russian law and Soviet law. Study of Soviet legal theory and Soviet interpretation of International Law.
- 230B. International Relations. (2) II. Mr. Seabury  
 (Formerly numbered 232B.)  
 Research seminar on selected topics, with emphasis chiefly upon contemporary approaches to the study of international relations.
231. International Organization. (2) I. Mr. Haas  
 Analytical studies of the ideologies and attitudes of political parties, pressure groups and elites with respect to the evolution of a consensus toward organization above the state level. The impact of organization on consensus is considered. Emphasis is placed on regional rather than universal trends.
- 232A-232B. American Foreign Policy. (2-2) Yr. Mr. Blaisdell  
 (Formerly numbered 230A-230B.)  
 American military, economic, social and political policies toward various parts of the world. Normally, North Atlantic and South American countries are considered during the first semester and Asian and African countries during the second semester.
- 233A-233B. International Law. (2-2) Yr. Mr. Preuss  
 Technique of international law and legal problems of international organization; critical analysis of the Charter of the United Nations; discussion of some actual projects for world organization from a legal point of view.
- 236A-236B. Seminar in Major Problems of the Middle East. (2-2) Yr. Mr. Lenczowski  
 A study of selected problems in politics, international relations, and political theory and institutions of Moslem and non-Moslem states in the area.
- \*237. Changing Institutions in Postwar Japan. (2) I. \_\_\_\_\_
- 238A-238B. International Relations of the Far East and the Pacific Area. (2-2) Yr. Mr. Mah
239. Political, Economic, and Social Problems of Southeast Asia. (2) I. \_\_\_\_\_

- 241A-241B. Problems of Government in the U.S.S.R. and Eastern Europe. (2-2) Yr. Mr. Towster
242. Constitutional, Political, and Administrative Problems of Dependent Areas. (2) II. Mr. Clokie
- 244A-244B. Contemporary Problems of Far Eastern Politics. (2-2) Yr. Mr. Scalapino  
A study of major problems of the contemporary Asian societies with particular relation to the broad political problems of the area as a whole.
- \*245A-245B. Contemporary Political Problems of Japan. (2-2) Yr. Mr. Scalapino
- \*246. American Far Eastern Policy. (2) II. \_\_\_\_\_  
Nineteenth- and early twentieth-century backgrounds. The two World Wars. United States' role in the postwar Far East.
- 247A-247B. Problems of India and Pakistan. (2-2) Yr. Mr. Park
- 248A-248B. Comparative Government. (2-2) Yr. Mr. Bellquist
249. Research in Comparative Government. (2) II. Mr. Lipson
- 250A-250B. Governments and International Relations of Latin America. (2-2) Yr. Mr. Macdonald  
Problems of government, politics, and administration in Latin America: inter-American relations.
- 252A. Dependent Peoples and Trusteeship. (2) II. Mr. Haas  
Colonial empires and the attempt to eliminate or to supervise them through international organization. Comparisons between colonial administration with and without international supervision. The probable impact of international supervisory techniques on the future status of dependent areas.
253. Seminar in Comparative National Administration. (2) I. Mr. Waldo  
Comparative studies of national administration in relation to constitutional structures, economic systems, historical traditions, and cultural patterns.
- 255A\*-255B. Federal Administration. (2-2) Yr. Mr. Lepawsky  
Special studies in problems of federal administration.
- 255C. Federal and Intergovernmental Administration. (2) I. Mr. Rupley  
Seminar in American federalism and intergovernmental relations, including fiscal relations, administrative relations in field offices, and relations in the course of legislative or executive decision-making, and of quasi-governmentally sponsored inquiries.
- 257A-257B. Constitutional and Administrative Law. (2-2) Yr. Mr. Aikin  
Fundamental principles of constitutional law; leading cases; judicial decisions affecting the liabilities, rights, duties, and procedure of governmental officers and agencies.
258. Private Power and Public Policy. (2) I. Mr. McConnell  
Research into the nature and sources, strategy and tactics of group power in the United States. Economic, religious and professional associations as organized power and its relationship to public policy.

\* Not to be given, 1954-1955.

- 259A-259B. American Politics. (2-2) Yr. Mr. Odegard
260. Jurisprudence. (2) II. Mr. Rosenblum  
The emphasis will be mainly on the analysis of legal concepts such as rights, duties and other fundamental legal conceptions, personality, ownership, possession, and the various types of obligation.
272. State Administration. (2) II. Mr. May
273. Public Personnel Administration. (2) II. Mr. Kaiser, Mr. Mosher  
Techniques and problems in the field of public personnel administration with special reference to federal, state, and local agencies.
274. Financial Administration and Budgeting. (2) II. Mr. Mosher  
Role of the budget system in the determination of public policy, in administrative planning and management, in control of government operations, in intergovernmental relations, and in relation to the private economy. Emphasis upon the administrative aspects of budgeting.
280. Administrative Theory. (2) II. Mr. Waldo
- 285A-\*285B. Regional Planning and Resources Management. (2-2) Yr. Mr. Lepawsky

## COURSES COMMON TO ALL GROUPS

199. Special Study for Advanced Undergraduates. (1-4) I and II.  
The Staff (Mr. Aikin in charge)
298. Individual Study. (1-4) I and II. The Staff (Mr. Harris in charge)

## BUREAU OF PUBLIC ADMINISTRATION

The Bureau of Public Administration, located in the Library Annex, maintains one of the most extensive collections to be found anywhere of current pamphlets, periodicals, documents, and fugitive materials pertaining to public affairs. Approximately 250,000 items and several thousand periodicals supplement the main collections of the University. The card catalog of approximately 750,000 entries under 2,000 subject headings greatly facilitates the use of the collection and renders it an extremely workable tool for the investigation of public affairs problems.

In addition to providing facilities for research by students, faculty, government officials, and civic organizations, the Bureau maintains its own research staff, representative of many of the social science disciplines, which upon request makes numerous studies for governmental agencies—for example, about 600 studies since 1934 for members and committees of the California State Legislature. An extensive bibliographic service in many fields is also provided. A monthly digest of significant public developments throughout the United States, of particular interest to California, is issued by the Bureau of Public Administration under the title: *California Public Survey*. Among its many projects is an occasional inventory of public affairs and social science research in the Western States, made for the Western Governmental Research Association. The Bureau serves as headquarters for that organization and also for the University campus and the San Francisco Bay Area Chapters of the American Society for Public Administration.

Opportunities are afforded to properly qualified graduate students to observe and participate in the research activities of the Bureau staff, as a part of the educational process.

The Bureau assists and cooperates with governmental agencies wishing to recruit university graduates for professional employment.

For further information, write to Professor Samuel C. May, Director, Room 346, Library Annex.

\* Not to be given, 1954-1955.

## BUREAU OF INTERNATIONAL RELATIONS

The Bureau of International Relations of the Department of Political Science, located in the Library Annex, was established by the University in 1921. The Bureau Library provides facilities for upper division and graduate students and members of the faculty to pursue research in the field of international relations, including international economics, international law, international organization, and international politics. Among other primary sources, it contains a complete set of official documents of the League of Nations, including its Treaty Series, the Publications of the Permanent Court of International Justice, and some of the principal documentary series of the United Nations. In addition to the documentary collection, the Library has many important secondary works dealing with current international problems, a number of outstanding American and foreign periodicals, and a limited number of English-language and other foreign newspapers regarded as most useful in this field.

In addition to providing the facilities for research, the Bureau is engaged in a number of other activities in the field of international relations. It provides the administrative service for the University's Committee on International Relations. It has responsibility for making arrangements to acquaint foreign visitors with the resources of the University. It works with the community agencies, such as the World Affairs Council of Northern California. It issues a *Monthly Review of Periodical Articles* in the field of international relations, and the *Indian Press Digests*.

Students interested in acquiring a knowledge of the forces and influences affecting present-day world politics or in preparing for careers in international relations and the Foreign Service of the United States, are afforded special opportunities through the facilities of the Bureau of International Relations.

Further information may be obtained from the office of the Bureau, Room 376 Library Annex, or from the Library of the Bureau, Room 388 Library Annex.

**POMOLOGY**

(Dean's Office, Agriculture, 133 Giannini Hall)

Warren P. Tufts, Ph.D., *Professor of Pomology, Davis (Chairman of the Department)*.

William H. Griggs, Ph.D., *Associate Professor of Pomology, Davis*.

## \*2. Principles of Fruit Growing. (3) I.

Mr. Griggs

Prerequisite: Botany 1 or 12.

An introduction to the principles underlying the behavior of fruit trees, their response to environment and cultural operations.

Given in the fall semesters of odd-numbered years.

**POULTRY HUSBANDRY**

(Department Office, 100 Poultry Husbandry Laboratory)

Samuel Lepkovsky, Ph.D., *Professor of Poultry Husbandry*.

I. Michael Lerner, Ph.D., *Professor of Poultry Husbandry*.

George F. Stewart, Ph.D., *Professor of Poultry Husbandry, Davis (Chairman of the Department)*.

Lewis W. Taylor, Ph.D., *Professor of Poultry Husbandry*.

\* Not to be given, 1954-1955.

## LOWER DIVISION COURSE

- \*1. Poultry Production. (3) I.  
Lectures and laboratory.  
An introductory study of the relation of the several sciences underlying poultry production to flock management.

## UPPER DIVISION COURSES

102. Experimental Incubation. (3) II. Mr. Taylor  
Lectures and laboratory.  
Prerequisite: Zoölogy 100 or equivalent; Chemistry 8.  
Problems of embryonic development, causes of embryonic mortality in poultry, and principles of artificial incubation.
198. Directed Group Study. (1-2) II. Mr. Taylor  
Prerequisite: senior standing and consent of instructor.  
Group study of methods employed in poultry production and management.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
The Staff (Mr. Taylor in charge)  
Prerequisite: course 1, courses basic to the problems elected, and consent of instructor.  
Problems may be elected relating to the nutrition, breeding, incubation, physiology, or egg and meat quality of chickens.

## GRADUATE COURSE

- 200A-200B. Research in Poultry Husbandry. (1-6; 1-6) Yr.  
Mr. Lepkovsky, Mr. Lerner, Mr. Taylor

**PSYCHOLOGY**

(Department Office, 1023 Life Sciences Building)

- Clarence W. Brown, Ph.D., *Professor of Psychology (Chairman of the Department)*.
- \*Egon Brunswik, Ph.D., *Professor of Psychology*.  
Richard S. Crutchfield, Ph.D., *Professor of Psychology*.  
Edwin E. Ghiselli, Ph.D., *Professor of Psychology*.
- †Harold E. Jones, Ph.D., *Professor of Psychology and Director of the Institute of Child Welfare*.  
David Kreech, Ph.D., *Professor of Psychology*.  
Jean Walker Macfarlane, Ph.D., *Professor of Psychology*.
- †Donald W. MacKinnon, Ph.D., *Professor of Psychology and Director of the Institute of Personality Assessment*.
- \*R. Nevitt Sanford, Ph.D., *Professor of Psychology*.  
Robert Choate Tryon, Ph.D., *Professor of Psychology*.  
Olga L. Bridgman, M.D., Ph.D., Sc.D., *Professor of Psychology, Emeritus*.  
Warner Brown, Ph.D., *Professor of Psychology, Emeritus*.  
George M. Stratton, Ph.D., *Professor of Psychology, Emeritus*.  
Edward C. Tolman, Ph.D., Sc.D., *Professor of Psychology, Emeritus*.  
Egerton L. Ballachey, Ph.D., *Associate Professor of Psychology*.

\* Not to be given, 1954-1955.

† Absent on leave, 1954-1955.

‡ In residence fall semester only, 1954-1955.

\* In residence spring semester only, 1954-1955.



- Harrison G. Gough, Ph.D., *Associate Professor of Psychology.*  
 \*Mason Haire, Ph.D., *Associate Professor of Psychology.*  
 Rheem F. Jarrett, Ph.D., *Associate Professor of Psychology.*  
 Leo J. Postman, Ph.D., *Associate Professor of Psychology.*  
 Benbow F. Ritchie, Ph.D., *Associate Professor of Psychology.*  
 Theodore R. Sarbin, Ph.D., *Associate Professor of Psychology.*  
 Alex C. Sherriffs, Ph.D., *Associate Professor of Psychology.*  
 Read D. Tuddenham, Ph.D., *Associate Professor of Psychology.*  
 Hubert S. Coffey, Ph.D., *Associate Clinical Professor of Psychology.*  
 Audrey Schumacher, Ph.D., *Associate Clinical Professor of Psychology.*  
 Ralph R. Canter, Jr., Ph.D., *Assistant Professor of Psychology.*  
 John P. McKee, Ph.D., *Assistant Professor of Psychology.*  
 Donald A. Riley, Ph.D., *Assistant Professor of Psychology.*  
 Mark R. Rosenzweig, Ph.D., *Assistant Professor of Psychology.*  
 William B. Sickles, M.A., *Associate in Psychology.*



- Edward N. Barnhart, Ph.D., *Lecturer in Psychology and Associate Professor of Speech.*  
 Frank Barron, Ph.D., *Lecturer in Psychology for the spring semester.*  
 Nancy Bayley (Nancy Bayley Reid), Ph.D., *Lecturer in Psychology.*  
 Morton E. Bitterman, Ph.D., *Visiting Associate Professor of Psychology.*  
 Dorwin P. Cartwright, Ph.D., *Visiting Professor of Psychology for the spring semester.*  
 Else Frenkel-Brunswik, Ph.D., *Lecturer in Psychology.*  
 James J. Gibson, Ph.D., *Visiting Professor of Psychology for the fall semester.*  
 Robert E. Harris, Ph.D., *Lecturer in Psychology and Associate Professor of Medical Psychology.*  
 Mary C. Jones, Ph.D., *Lecturer in Psychology and Associate Professor of Education.*  
 Catherine Landreth, Ph.D., *Lecturer in Psychology and Associate Professor of Home Economics.*

*Letters and Science List.*—All undergraduate courses in this department except 3, 104, 114, 116, 117, 180, 185, and 186 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Ballachey, Mr. McKee, Mr. Rosenzweig, Mr. Sarbin, Mr. Tuddenham.

*Preparation for the Major.*—Required: courses 1A, 1B, 5, Physiology 1, 1L, and Zoölogy 10. (Zoölogy 1A–1B may be substituted for Physiology 1, 1L and Zoölogy 10.) Second-year high school algebra or Mathematics D is prerequisite to Psychology 5. Psychology 1A, 1B, 5, Physiology 1 and 1L are not open to entering freshmen. The required courses should be completed before the beginning of the junior year and must be completed before the beginning of the senior year. Recommended: English composition, mathematics, philosophy, anthropology, sociology, and economics. Completion of prerequisites for upper division work in several of these fields is highly desirable, since the psychology major requires advanced work in departments other than psychology.

\* Absent on leave, 1954–1955.

‡ In residence spring semester only, 1954–1955.

*The Major.*—The major consists of not less than 24 units in upper division courses to include the following: (1) a year course, 100A–100B, Survey of General Psychology, to be taken when possible in the junior year; (2) 6 units in an area of concentration to be selected from the list of areas presented below; (3) 3 units in each of two areas (see below) other than the area of concentration; (4) 6 units in courses outside of psychology to be selected from the list of courses presented below. For honors majors Psychology 101A–101B may be used to satisfy requirement (3) above.

#### Required Courses in Areas of Concentration

Animal Psychology: courses 150A and 150B or 151 or 130  
 Abnormal Psychology: courses 160, 168  
 Clinical Psychology: courses 162, 165  
 Developmental Psychology: courses 112 and 113 or 114  
 Differential Psychology: courses 146A and 146B or 165  
 Experimental Psychology: courses 106A and 130 or 131  
 History and Systems of Psychology: courses 120, 126  
 Industrial Psychology: courses 185 and 187 or 188  
 Personality: course 148A–148B, or courses 136 and 141  
 Physiological Psychology: course 108A–108B  
 Social Psychology: courses 145 and 142A or 142B  
 Tests and Measurements: courses 186 and 104 or 165

*List of courses in other departments acceptable as part of the major in psychology:*

Anatomy 102, 103  
 Business Administration 151  
 Economics 106A–106B, 150, 152, 180  
 Education 110, 116, 153, 154, 161, 164  
 Genetics 100, 102  
 Home Economics 132, 133, 142  
 Optometry (Physiological Optics) 105B, 106B  
 Political Science 181, 183  
 Social Welfare 106  
 Speech 117A–117B, 118, 119  
 Zoölogy 114, 115

Any upper division course in:

Anthropology  
 Mathematics  
 Philosophy  
 Physiology  
 Sociology and Social Institutions.

The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses included in the major. Students who do not maintain such an average may be required at any time to withdraw from the major in psychology.

*Honor Students.*—Honors are granted on the basis of the whole record of the student.

#### LOWER DIVISION COURSES

1A. General Psychology. (3) I and II. Mr. Krech, Mr. Crutchfield  
 Three lectures and one section meeting per week. Not open to entering freshmen.

The sequence 1A–1B or 1A–33 will be accepted in fulfillment of requirement (e) for the degree of Associate in Arts.

- 1B. General Psychology. (3) I and II. Mr. C. W. Brown, Mr. Sickles  
 Prerequisite: course 1A.  
 Two lectures and one three-hour laboratory per week.  
 A continuation of course 1A with a detailed treatment of the application of the scientific method in the study of behavior. Basic assumptions, limitations, and advantages of the method of experiment. Intended primarily for prospective major students.
- \*3. Introduction to Applied Psychology. (3) II. Mr. Ghiselli  
 Prerequisite: sophomore standing.  
 A survey of psychological problems occurring in the setting of daily life, particularly vocational choice; personal adjustment and efficiency; employee selection, training, motivation, and labor relations; advertising, selling, and market research; public opinion measurement; safety; mental hygiene; law; and medicine.
5. Introduction to Psychological Measurements. (3) I and II. Mr. Jarrett, Mr. Tuddenham  
 Three lectures and one section meeting per week.  
 Open only to students whose major subject is psychology.  
 Prerequisite: second-year high school algebra or Mathematics D, and course 1A (may be taken concurrently). Not open to students who are taking, or have taken, another course in statistics.  
 Arrays of experimental measurements, central tendencies, variability, correlation, significance of measures; elementary reliability and validity of tests.
33. Personal and Social Adjustment. (3) I and II. Mr. Sherriffs  
 Prerequisite: course 1A. A continuation of course 1A intended primarily for students who will not major in psychology.  
 The dynamics of normal personality development. Family relationships, social adjustment, and factors modifying self-evaluation are emphasized.

## UPPER DIVISION COURSES

Unless otherwise stated courses 1A, 1B, and junior standing are prerequisite to all upper division courses.

- 100A-100B. Survey of General Psychology. (3-3) Yr. Mr. Postman, Mr. Bitterman, Mr. Gibson, Mr. Riley  
 Two lectures and one two-hour laboratory section per week.  
 Prerequisite: courses 1A, 1B, and 5.  
 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.
- \*101A-101B. Methods of Psychology. (3-3) Yr. Mr. Jarrett, Mr. Riley  
 Lectures and laboratory.  
 Prerequisite: courses 1A, 1B, 5, and consent of instructor. Restricted to major students.  
 Exercises in the application of experimental and statistical methods to problems in the various areas of specialization in psychology. Formulation of problems, research design, control of variables, treatment of data, evaluation and interpretation of results.

\* Not to be given, 1954-1955.

- \*102A-102B. Advanced General Psychology. (3-3) Yr. \_\_\_\_\_  
 Prerequisite: consent of instructor. Restricted to major students.  
 102A will be offered in the spring semester.  
 A consideration of the basic psychological processes of motivation, perception, learning, thinking, and emotion, as exhibited in behavior and consciousness and as modified by differences in capacity and in individual and social experience. Lectures, demonstrations, and class discussions.
- \*104. Principles of Test Construction. (3) I. Mr. Ghiselli  
 Lectures and demonstrations.  
 Prerequisite: courses 1A, 1B, and 5 or an equivalent course in statistics.  
 Methods of constructing and validating psychological tests and scales, devising adequate criteria, principles of item construction, item reliability and validity, determining optimal scoring and weighting, devising relative and absolute scales.
- \*105. Psychology of Speech and Communication. (3) I. Mr. Rosenzweig  
 Prerequisite: courses 1A, 1B, and 5.  
 A broad examination of research and theories of communication including the physical nature of speech sounds, psychophysics of perception, physiological mechanisms of speech and audition, communication, development of speech in children, and individual differences in speech.
- 106A. Experimental Psychology. (3) II. Mr. Riley  
 Lectures and laboratory.  
 Prerequisite: courses 1A, 1B, and 5 or an equivalent course in statistics.  
 A survey with performance of typical experiments on reaction tendencies, perception, learning and problem-solving. Emphasis on methods of experimentation.
- \*106B. Experimental Psychology. (3) I and II. \_\_\_\_\_  
 Lectures and four hours of laboratory to be arranged.  
 Individual laboratory problems.
107. Advanced Statistical Methods in Psychology. (3) I. Mr. Jarrett  
 Lectures and laboratory.  
 Prerequisite: course 5 or an equivalent course in statistics.  
 Reference points and units of measurement, correlation, reliability and validity, scoring of individual achievement, partial and multiple correlation, construction of scaled tests, representation of learning functions.
- 108A-108B. Physiological Psychology. (3-3) Yr. Mr. Rosenzweig  
 Lectures and laboratory.  
 Prerequisite: courses 1A, 1B, 5, and Physiology 1 and 1L or consent of instructor.  
 A survey of relations between behavior and biological processes. Coordination of behavior; anatomy and physiology of the nervous system; sensory processes; perceptual dynamics; neural and hormonal processes in motivation; changes in the organization of the nervous system in maturation and learning.
- \*109. Representative Design of Psychological Experiments. (3) II. Mr. Brunswik  
 Prerequisite: senior or graduate standing, and either 106A and 107, or 101A-101B (which may be taken concurrently), or equivalent preparation in experimental and statistical methods.  
 Theory and application of experimental designs particularly suited to the problems of psychology, with special emphasis on examples from physical and social perception.

111. Child Psychology. (2) I. \_\_\_\_\_  
 Prerequisite: course 1A, and either 1B, 5, or 33 (1B, 5, or 33 may be taken concurrently).  
 Behavior of normal children. Prenatal development; the period of infancy; mental, social, and personality development in childhood.
112. Developmental Psychology. (3) II. Mr. McKee  
 Prerequisite: courses 1A, 1B, and 5.  
 Primarily for majors in psychology; majors in closely related departments will be admitted by consent of instructor. Not open to students who have taken course 111 or Home Economics 132.  
 The development of motor functions, social and emotional traits, language, and mental abilities. Individual differences in development and performance, as related to physical, social, and psychological factors.
113. Adolescence. (2) II. \_\_\_\_\_  
 Prerequisite: courses 1A, 1B, and 5. Primarily for majors in Psychology.  
 A survey of current research, with particular reference to the analysis and interpretation of data from growth studies.
- 113N. Adolescent Psychology. (2) II. Mr. Sherriffs  
 Prerequisite: course 1A and one other course in psychology.  
 A survey of adolescent development and the problems of adolescents. This course is for non-majors; it is not open to students who have taken Psychology 113.
114. Laboratory in Child Study. (2) II. Mr. McKee  
 One hour of lecture and three hours of laboratory to be arranged.  
 Prerequisite: courses 1A, 1B, and 5.  
 Experience is given in specific observational and test procedures and in the collection and analysis of records for individual studies of young children.
- \*115. Laboratory in Adolescent Development. (1) II. Mr. Jones  
 Three hours to be arranged.  
 Prerequisite: consent of instructor.  
 Offered to a limited number of students also enrolled in course 113.  
 Individual projects and reports.
116. Tests and Measurements of Infants and Preschool Children. (1) I. Miss Bayley  
 Prerequisite: courses 5 and 112 or Home Economics 132.  
 Instruction in the most commonly used techniques of measurement of physical, motor, and mental development, with evaluation and interpretation of test scores and measures of infants and young children.
117. Laboratory Tests and Measurements of Infants and Preschool Children. (2) I. Miss Bayley  
 Prerequisite: consent of instructor.  
 Laboratory work at the Institute of Child Welfare, accompanying course 116.
- \*120. Introduction to History and Systems of Psychology. (3) II. Mr. Postman  
 Prerequisite: course 1A and at least 12 upper division units in psychology, or graduate standing in philosophy, biology, or sociology.  
 Major stages in the emergence of psychology as an independent science

\* Not to be given, 1954-1955.

from its beginnings in ancient philosophy and medicine to the present. Classical nineteenth-century structuralism will be compared with such modern schools as functionalism, behaviorism, Gestalt psychology, and psychoanalysis.

- \*126. Contemporary Psychology. (3) II. \_\_\_\_\_  
 Prerequisite: courses 1A, 1B, and at least 6 upper division units in psychology. Primarily for seniors.  
 Reading and discussion of current books and monographs, affording a survey of contemporary aims, methods, and achievements.
130. Learning. (3) I. Mr. Postman  
 Survey of experimental and theoretical work in the psychology of memory and learning.
131. Perception. (3) I. Mr. Gibson  
 Lectures and demonstrations on the perception of form (Gestalt) and of objects in three-dimensional space, and on first impressions from photographs and from other reduced social contact; interaction of cognition and motivation.
134. Motivation. (3) I. Mr. MacKinnon  
 Prerequisite: courses 1A, 1B, and at least 6 upper division units in psychology. Primarily for seniors and graduates.  
 The nature of primary and secondary drives; the theories concerning drives found in animal, child, experimental, social, and abnormal psychology, and in philosophy.
135. Thinking. (3) II. Mr. Sarbin  
 Prerequisite: courses 1A, and 1B or 33.  
 Survey of experimental and theoretical work on concept formation and thought processes.
136. Psychology of the Unconscious. (3) II. Mr. Barron  
 Prerequisite: course 1A.  
 A consideration of the evidence for, and the nature and role of, unconscious psychological processes in behavior.
- \*141. Personality in Society and Culture. (3) II. Mr. Sarbin  
 Prerequisite: courses 1A, 1B, and senior standing.  
 A consideration of the social and cultural determinants of personality.
- 142A-142B. Experimental Social Psychology. (3-3) Yr. Mr. Ballachey, Mr. Tryon  
 Prerequisite: courses 1A, 5, and 145, or equivalent, and consent of instructor.  
 142A. The design of experiments in social psychology utilizing the social survey methodology. II.  
 142B. The design of experiments in social psychology utilizing laboratory and field methods other than the social survey. I.  
 Either half of the course may be taken independently.
144. Social Psychology of the Interview. (3) I. Mr. Ballachey  
 Lectures and laboratory.  
 Prerequisite: courses 1A and 145 or consent of instructor.  
 Processes of communication in interview techniques used in the social sciences, with special reference to distortions arising from differences in psychosociological frames of reference of the participants.

145. Social Psychology. (3) II. Mr. Krech  
Prerequisite: course 1A.  
Sections to be arranged.  
Psychological nature of: society, its functions and instruments; social groups, their ways, sanctions, symbols, social controls; social status, prestige and mobility; social interaction, including conflict; social change. The person's adjustment to these phenomena.
- 146A-146B. Differential Psychology. (3-3) Yr. Mr. Tryon  
Prerequisite: courses 1A, 5 or equivalent, and one other course in psychology, or consent of instructor. (Course 146A may be omitted as prerequisite to 146B with consent of instructor.)  
146A. Hereditary and environmental bases of individual differences in intelligence and personality. Family, sex, class, and race differences.  
146B. Continuation of 146A. An introduction to factor and cluster analysis of individual and group differences.
- 148A-148B. Personality. (3-3) Yr. Mrs. Schumacher, Mr. Sanford  
Prerequisite: course 1A and either 1B or 33; 162 or 134 or 136 and senior or graduate standing.  
A survey of recent thought and research in the field of personality, with emphasis on dynamic and genetic problems.
- 150A. Animal Psychology. (3) I. Mr. Bitterman  
General survey of the behavior of the higher animal forms.
- \*150B. Animal Psychology. (3) II. Mr. Ritchie  
Lectures and laboratory.  
A more intensive survey of the experimental literature on learning, motivation, and problem solving in the higher forms.
151. Experiments in Animal Psychology. (3) II. Mr. Ritchie  
Lecture and laboratory.  
Prerequisite: course 150A and consent of instructor.
160. Mental Deficiency. (3) I. Miss Bridgman  
Prerequisite: course 1A and upper division standing.  
Mental deficiency and abnormality in children, including a consideration of tests used in clinical examinations.
161. Personality Development. (3) II. Mrs. Schumacher  
Prerequisite: senior standing; either course 111, 112, 113, 160, or Home Economics 132. Limited to nonpsychology majors.  
A survey of biosocial factors in the dynamics of normal personality development.  
Students may not obtain credit for both 161 and 162.
162. Clinical Psychology. (3) I. Mrs. Macfarlane  
Prerequisite: courses 1A, 1B, 5 or equivalent, and either course 112, 113, 160, 168.  
Dynamics of personality development with special reference to clinical methods and problems. Limited to psychology majors.  
Students may not obtain credit for both 161 and 162.
165. Introduction to Clinical Methods. (3) I. Mr. Tuddenham  
Prerequisite: courses 1A, 1B, and 5.  
A consideration of the methods and procedures of clinical diagnosis. Historical development of psychometric theory. Description and evaluation of the principal tests of ability and personality.

168. Abnormal Psychology. (3) II. Miss Bridgman  
Prerequisite: course 1A and at least 6 units of upper division psychology or, with consent of instructor, premedical status.  
The relations of psychology to the psychoneuroses and psychoses; the appearance of abnormal traits in incipient stages of mental disturbance.
180. Psychological Aspects of Advertising and Marketing. (3) II. Mr. Canter  
Prerequisite: course 1A or 3.  
A consideration of the application of psychological techniques and principles derived from controlled observation to the study of problems in advertising, selling, and market research. Field work.
185. Personnel and Industrial Psychology. (3) I. Mr. Canter  
Prerequisite: course 1A.  
A discussion of techniques for the selection and classification of employees, the psychological aspects of the study of work methods, conditions of work, training, employee motivation, and morale.
186. Individual Appraisal and Occupational Analysis. (3) II. Mr. Ghiselli  
Lectures and laboratory.  
Prerequisite: courses 1A, 1B, 5.  
Theories and principles of differences among individuals relevant to industrial problems; concepts and methods in occupational analysis classification.
187. Human Relations in Industry. (3) II. Mr. Canter  
Prerequisite: course 185.  
The motivation of workers, psychological aspects of worker-management relationships, factors in employee morale, the maladjusted worker, leadership.
188. Attitudes and Perception in the Industrial Society. (3) II. Mr. Cartwright  
Prerequisite: courses 1A, 1B, and 5.  
Theoretical problems of perceptual and attitudinal organization in industrial situations, role perceptions in labor and management relations, genesis of attitudes, morale surveys and similar problems.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff  
By permission, honor students who are adequately prepared may carry on study or research under the guidance of a member of the department.

## GRADUATE COURSES AND SEMINARS

Full graduate status in psychology and consent of the instructor are prerequisite to all graduate offerings. Graduate students in neighboring fields may participate in certain courses or seminars by consent of the instructor.

There will be a general colloquium of staff and graduate students which will be scheduled as the situation warrants. There will be no credit offered for these meetings.

- †204E. Seminar in Principles of Measurement. (2) I and II. Mr. C. W. Brown, Mr. Jarrett
- 206E. Seminar in Experimental Psychology. (2) I and II. Mr. Jarrett, Mr. Riley, Mr. Postman  
Limited to students who are engaged in experimental work.
207. Quantitative Methods in Psychology. (3) II. Mr. Jarrett  
A discussion of quantitative research methods in psychology. Principles necessary to the understanding and use of rational and empirical equa-

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



tions in psychology, together with problems arising in connection with some of the more common statistical hypotheses encountered in psychological research.

- 208E. Seminar in Physiological Psychology. (2) I and II. Mr. Rosenzweig
- 209E. Seminar in Individual Differences. (2) II. Mr. Tryon
- †210E. Seminar in Constitutional Psychology. (2) II. Mr. Tuddenham
- \*212E. Seminar in Developmental Psychology. (2) I.  
Mr. Jones, Mrs. Jones, Mr. McKee
228. The Conceptual Framework of Psychology. (3) II. Mr. Brunswik  
Prerequisite: course 120 or any acceptable course in history or systems of psychology. Graduate students in philosophy, sociology, biology, or physics may be admitted by consent of instructor.  
Further discussion of history and systems of psychology, with special emphasis on the philosophy of science as applied to psychology. Introspective and objective, molecular and molar, peripheral and central-distal point of view. The status of theory in modern psychology; description versus explanation, idiographic versus statistical versus nomothetic approach.
- 231E. Seminar in Perception. (2) I. Mr. Gibson  
Prerequisite: consent of instructor.  
Discussion of published or current work on the cognitive aspects of perception.
- †235E. The Nature of Psychological Change. (2) I. Mr. Sherriffs  
Examination of the basic principles applicable to the major categories of psychological change such as learning and problem-solving, personality restructuring, and modification of social patterns. Critical evaluation of the constructs available for the study of such change will be undertaken.
- †239E. Social Perception. (2) II. Mr. Cartwright  
A detailed consideration of the relationship between behavior and the individual's organization of the environment, with special attention to diagnosis of the perceptual fields, and the circumstances under which behavior will change.
- \*240. Personality Assessment. (3) II. Mr. Gough  
Lectures and laboratory.  
The rationale and practice of procedures for the diagnosis and assessment of personality.
- 240E. Seminar in Personality Tests and Assessment Methods. (2) I. Mr. Gough  
Prerequisite: graduate standing; course in personality testing; consent of instructor.  
Critical review and evaluation of personality tests and assessment methods.
- \*241E. Seminar in Personality and Culture. (2) I. Mr. Sarbin  
Prerequisite: graduate standing.  
Lecture and discussion of problems and theoretical formulations encountered in the study of social and cultural determinants of personality organization.

\* Not to be given, 1954-1955.

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

- 243E. The Social Psychology of Behavior Disorders. (2) II. Mr. Ballachey  
Critical examination of the relationships between social psychological environmental variables and behavior disorders with especial emphasis on research problems.
- 245E. Seminar in Social Psychology. (2) II. Mr. Krech  
Enrollment limited to sixteen students.  
For students primarily interested in conducting research in social psychology. Students will be expected to prepare an outline for a projected study, do the necessary library research for such a study, and conduct a test run of the study (or pilot study). Seminars will be devoted to a critical discussion of the student's work at each stage.
- 246E. Perception and Personality. (2) II. Mrs. Frenkel-Brunswik, Mr. Krech  
An examination of current theory of perceptual and cognitive processes with special attention to these processes as aspects of the personality structure of the individual. Emphasis will be on the experimental approach.
247. Advanced Group Dynamics and Group Therapy. (3) I and II.  
Two two-hour sessions per week. Mr. Coffey, Mr. Cartwright  
Ways in which groups may be utilized in the training and therapy of the individual, survey of pertinent literature, and actual experience with group techniques such as role playing, psychodrama, reality testing, as training and therapeutic devices.  
Social welfare and public health students may be admitted.
- \*247E. Seminar in Group Dynamics and Group Therapy. (2) II. Mr. Coffey
- 248E. Seminar in Personality. (2) II. Mr. Sanford
- \*249. Experimental Psychodynamics. (3) II. Mr. Sarbin  
Two hours of lecture and four hours of laboratory work per week to be arranged.  
A general survey of the psychodynamics of behavior, with special emphasis upon the experimental literature.
- 249E. Seminar in Dynamic Psychology. (2) I. Mr. MacKinnon
- †250E. Seminar in Animal Psychology. (2) I and II. Mr. Bitterman, Mr. Ritchie
- 261A-261B. Clinical Methods. (3-3) Yr. Mr. Tuddenham, Mr. Coffey  
Lecture and laboratory; four hours of field work to be arranged.  
Consideration of clinical methods of measurement, interview, and observation.
- 263A-263B. Advanced Clinical Diagnostic Testing. (3-3) Yr. Mr. Gough, Mr. Sarbin  
Prerequisite: course 261B or consent of instructor.  
Theory and practice of personality testing. Administration, scoring, and interpretation of diagnostic tests used in clinical settings. Emphasis on the Rorschach method, the Thematic Apperception Test, and Minnesota Multiphasic Personality Inventory, and other established techniques.
- 264E-264F. Seminar in Case History. (2-2) Yr. Mr. Sarbin, Mr. Coffey  
Prerequisite: course 261B.  
The case history method in psychology with emphasis on diagnostic aspects.

\* Not to be given, 1954-1955.

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

- 265E-265F. Advanced Seminar in Case History. (2-2) Yr.  
Prerequisite: course 264F. Mrs. Schumacher, Mr. Sherriffs  
The case history method in psychology with emphasis on therapeutic aspects.
- 266E. Seminar in Theories of Therapy. (2) II. Mrs. Schumacher  
Prerequisite: course 264F.  
A critical survey of the major theories upon which psychotherapy is based.
- \*267E. Seminar in Medical Psychology. (2) II. \_\_\_\_\_
- †268E. Seminar in Abnormal Psychology. (1) II. Miss Bridgman
- 269E. Seminar in Clinical Research Methods. (2) I and II. Mrs. Macfarlane
- 285E. Seminar in Applied and Industrial Psychology. (2) II. Mr. Ghiselli
- 287E. Seminar in Psychology of Human Relations. (2) I. Mr. Canter  
The role of psychology in the field of human relations with emphasis upon experimental and other methodological approaches.
298. Proseminar in Research Methods. (2) I.  
Mr. Ballachey, Mr. Ghiselli, Mr. Kreeh  
Introduction to research in psychology. Problems of experimental design and analysis considered in relation to individual projects.
299. Research. (1-6) I and II. The Staff  
Laboratory, library, or field work as the problem requires.
300. Seminar in the Presentation of Psychological Material. (2) II.  
Mr. Crutchfield  
Critical approach to presentation of psychological material in publications, lectures, demonstrations, etc., with emphasis on content, evidence, and significance of material, and relevant techniques of presentation.

## PUBLIC HEALTH

(Department Office, 216 Building T-4)

- Margaret Beattie, M.A., Gr.P.H., *Professor of Public Health.*
- †Jessie M. Bierman, M.D., M.S.P.H., *Professor of Maternal and Child Health.*
- Vera S. Fry, R.N., A.M., Ed.D., *Professor of Nursing Administration.*
- Harold B. Gotaas, Sc.D., *Professor of Sanitary Engineering.*
- Dorothy Bird Nyswander (Dorothy Nyswander Palmer), Ph.D., *Professor of Public Health.*
- William C. Reeves, Ph.D., M.P.H., *Professor of Epidemiology.*
- Edward S. Rogers, M.D., M.P.H., *Professor of Public Health and Medical Administration.*
- Charles Edward Smith, M.D., D.P.H., *Professor of Public Health (Chairman of the Department).*
- Jacob Yerushalmy, Ph.D., *Professor of Biostatistics.*
- Robert T. Legge, Ph.G., M.D., F.A.C.S., *Professor of Hygiene, Emeritus.*
- William Griffiths, Ph.D., *Associate Professor of Public Health.*
- \*Nell F. Hollinger, Ph.D., *Associate Professor of Public Health.*

\* Not to be given, 1954-1955.

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

‡ In residence fall semester only, 1954-1955.

- \*Edith M. Lindsay, Ed.D., *Associate Professor of Public Health.*  
 Walter S. Mangold, B.S., *Associate Professor of Public Health.*  
 William W. Stiles, M.D., M.P.H., *Associate Professor of Public Health.*  
 Bernard D. Tebbens, Sc.D., *Associate Professor of Industrial Hygiene Engineering.*  
 Edwin S. Crosby, Ph.D., *Assistant Professor of Public Health and Sanitary Science.*  
 Warren J. Kaufman, Sc.D., *Assistant Professor of Sanitation and Sanitary Engineering.*  
 Chin Long Chiang, Ph.D., *Instructor in Public Health.*  
 Calvin Zippin, Sc.D., *Instructor in Public Health.*  
 Henry P. Anderson, M.A., *Associate in Public Health.*  
 Elizabeth B. Austin, M.P.H., *Associate in Public Health.*  
 Dorothy L. Chandler, M.P.H., *Associate in Public Health.*  
 Marjorie A. Gonzalez, M.A., *Associate in Public Health.*  
 Flora J. Hanks, R.N., A.B., *Associate in Public Health.*  
 Richard K. Lansing, M.P.H., *Associate in Public Health.*  
 Marian E. Leach, M.P.H., *Associate in Public Health.*  
 Robert S. McInnes, A.B., *Associate in Public Health.*  
 Sarah Mazelis, M.P.H., *Associate in Public Health.*  
 Morgan J. Morley, M.P.H., *Associate in Public Health.*  
 Charles R. Nicewonger, M.A., *Associate in Public Health.*  
 William D. Simmons, M.P.H., *Associate in Public Health for the spring semester.*  
 Richard V. Walker, M.P.H., *Associate in Public Health.*



- Lewis W. Hackett, M.D., Dr.P.H., *Visiting Professor of Public Health.*  
 Rodney R. Beard, M.D., M.P.H., *Clinical Professor of Occupational Health.*  
 Richard J. Stull, A.B., *Clinical Professor of Hospital Administration.*  
 Charles H. Hine, Ph.D., M.D., *Associate Clinical Professor of Public Health.*  
 Mortimer A. Benioff, M.D., *Lecturer in Public Health.*  
 Lester Breslow, M.D., *Lecturer in Public Health.*  
 Harold D. Chope, M.D., Dr.P.H., *Lecturer in Public Health.*  
 William H. Clark, M.D., M.P.H., *Lecturer in Public Health.*  
 Bennett J. Cohen, D.V.M., Ph.D., *Lecturer in Public Health.*  
 Robert McCall Drake, M.D., M.P.H., *Lecturer in Public Health.*  
 John E. Dunn, Jr., M.D., M.P.H., *Lecturer in Public Health.*  
 Robert Dyar, M.D., Dr.P.H., *Lecturer in Public Health.*  
 Seymour M. Farber, M.D., *Lecturer in Public Health.*  
 George M. Foster, Ph.D., *Lecturer in Public Health and Visiting Professor of Anthropology.*  
 Charles B. Frasher, M.A., M.Ed., *Lecturer in Public Health.*  
 Fern E. French, M.A., *Lecturer in Public Health.*  
 David Frost, M.D., M.P.H., *Lecturer in Public Health.*  
 George L. Hall, LL.B., *Lecturer in Hospital Administration.*  
 Floyd W. Hartmann, Sc.D., *Lecturer in Public Health.*  
 Ritz E. Heerman, *Lecturer in Hospital Administration.*  
 Arthur C. Hollister, Jr., M.D., M.P.H., *Lecturer in Public Health.*

\* Absent on leave, 1954-1955.

Ruth L. Huenemann, D.Sc., *Lecturer in Public Health Nutrition and Lecturer in Home Economics.*

Richard A. Koch, M.D., M.P.H., *Lecturer in Public Health.*

Edwin H. Lennette, M.D., Ph.D., *Lecturer in Virology and Lecturer in Bacteriology for the spring semester.*

John R. McKinley, M.A., *Lecturer in Public Health.*

Alfred E. Maffly, B.S., F.A.C.H.A., *Lecturer in Hospital Administration.*

Malcolm H. Merrill, M.S., M.D., M.P.H., *Lecturer in Public Health.*

Cornelius Martin Mills, M.D., M.S.P.H., *Lecturer in Public Health.*

Beulah Parker, M.D., *Lecturer in Public Health.*

William W. Sampson, Ph.D., *Lecturer in Public Health.*

Henry C. Schumacher, M.D., LL.D., *Lecturer in Public Health.*

William W. Stadel, M.D., *Lecturer in Hospital Administration.*

Tracy I. Storer, Ph.D., *Lecturer in Public Health.*

Keith O. Taylor, Ph.B., M.B.A., F.A.C.H.A., *Lecturer in Hospital Administration.*

Helen E. Walsh, M.A., *Lecturer in Public Health.*

James Watt, M.D., Dr.P.H., *Lecturer in Public Health.*

George U. Wood, Ph.C., *Lecturer in Hospital Administration.*

Kent Zimmerman, M.D., *Lecturer in Public Health and Lecturer in Social Welfare.*

*Letters and Science List.*—Courses 5A–5B, 35, 106, 160A–160B, 163 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

#### LOWER DIVISION COURSES

- 5A. Individual and Community Health. (3) I and II. Mr. Stiles  
A survey of the entire field of public health, including field observations and a consideration of the evolution of disease prevention and control; the social, medical, and economic aspects of sickness, disability, and death.
- 5B. Individual and Community Health. (3) I and II. Mr. Stiles  
Prerequisite: course 5A.  
Continuation of 5A.
35. Personal Health Problems. (3) I and II. Mrs. Fry  
Enrollment limited to students in the lower division. Sections limited to fifty students.  
A consideration of the factors which determine physical, mental, and emotional health and influence the prevention of disease. Application of these factors to the solution of individual health problems.
- †49. Field Training Course. (No credit) Given during the four weeks following the close of each semester. Mr. Mangold, Mr. Sampson  
Prerequisite: consent of instructor.  
Field training in health departments and/or military establishments for learning administrative methods and practical procedures in environmental sanitation.

#### UPPER DIVISION COURSES

- 100A. Introduction to Health Administration. (3) I and II. \_\_\_\_\_  
Prerequisite: course 5A–5B or consent of instructor.  
Principles of public administration and fundamentals of organization and administration in public health.

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

100B. Introduction to Health Administration. (3) II. Mr. K. O. Taylor  
Principles of hospital and medical care organization and administration.

103A-103B. Hospital Organization and Management. (3-3) Yr.  
Mr. K. O. Taylor, Mr. Stull

Prerequisite: Business Administration 1A-1B. Restricted to students enrolled in the Hospital Administration curriculum or consent of instructor.

Consideration of the fundamentals of organization, business and financial management, personnel management, plant operation, staff organization, and community relationships as applied to hospital administration.

106. Medical Sociology. (3) I. Mr. Rogers  
A consideration of the social and economic factors related to health, disease, and the receipt of medical care.

†108. Advanced Problems in Public Health Administration. (1-5) I and II.  
Mr. Rogers

109. Advanced Problems in Medical Administration. (1-5) I and II.  
Prerequisite: consent of instructor. Mr. K. O. Taylor, Mr. Rogers

111. Environmental Sanitation. (2) I and II.  
Mr. Gotaas, Mr. Kaufman, Mr. Mangold  
A condensed presentation of the principles and practices of environmental sanitation for advanced public health students.

112. Control of Vector and Reservoir Animals Affecting the Public Health. (3) I. Mr. Sampson  
Prerequisite: consent of instructor.  
Principles and practices governing the control of invertebrate and lower vertebrate animals harboring, transmitting, and causing diseases of public health importance.

113. Sanitary Control of Foods. (3) II. Mr. Sampson  
Prerequisite: consent of instructor.  
Principles of sanitary science as related to food production, processing, and distribution, and to food-handling.

114. Advanced Problems in Sanitation. (1-5) I and II. Mr. Mangold

117. Sanitary Microbiology of Water and Sewage. (4) I. Mr. Crosby  
Primarily for students specializing in sanitary science or sanitary engineering, but open to others with consent of instructor.  
Principles of biology and their application to sanitary science, with emphasis on the microbiology of water and sewage.

118. Sanitary Microbiology of Foods and Beverages. (4) II. Mr. Crosby  
Prerequisite: Bacteriology 2 or course 117, or consent of instructor.  
Principles of biology and their application to sanitary science, with emphasis on the microbiology of foods and beverages.

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

## 119. Administrative Aspects of Sanitary Science. (2) I and II.

Mr. Mangold

Prerequisite: Civil Engineering 124 and course 113 (may be taken concurrently), or consent of instructor.

The administrative aspects of sanitary science as applied to the fields of communicable disease control, schools, recreation, housing, emergencies, and including organizations, laws, and personnel.

## 125. Child Health. (3) I.

Miss Bierman

Lectures, three hours: group conferences, and field observations.

A consideration of factors pertaining to the health of children from conception to the end of puberty; community health facilities.

## 131. Health Education Laboratory. (2) I and II.

Prerequisite: consent of instructor. Miss Nyswander, Mr. Griffiths

Emphasis will be placed on techniques of teaching health to adults through the media of radio, films, slides, posters, press, printed materials, and lectures. Research in these fields will be evaluated, and exercises in preparing and using materials will be included.

## \*132. Group Study in Health Instruction. (2) II.

Miss Lindsay

Prerequisite: open to seniors majoring in health education and graduate students in public health.

Considerations basic to health instruction with community groups. Evaluation of objectives, methods, and resource materials.

## 133. Introduction to Group Process. (2) II.

Miss Nyswander

Prerequisite: open only to undergraduate students in public health with consent of instructor.

Consideration of dynamics of interpersonal relationships as they affect group membership, leadership ability, and community work in the public health field.

## 134. Community Health Education. (3) I and II.

Mr. Griffiths

Primarily for students specializing in some area of health work who have taken basic courses in biological sciences, education, and psychology. Theory and field problems in community health education. Review of studies relating to factors affecting group learning.

## \*135. Individual Health. (3) I.

Miss Lindsay

A consideration of fundamental physiological mechanisms and application to promotion and protection of health.

## \*136. Health Programs for the School-Age Child. (2) II.

Miss Lindsay

Consideration of the community resources contributing to a health program for the school-age child; administrative and organizational principles involved.

## 145. Community Control of the Communicable Diseases. (3) I and II.

The epidemiology and community control of communicable diseases, including tuberculosis and the venereal infections.

## 147A. Principles of Epidemiology. (2) I.

Mr. Reeves, Mr. Smith

Prerequisite: knowledge of medical microbiology.

Principles of epidemiology and a study of the infection chains of certain type diseases.

\* Not to be given, 1954-1955.

- 147B. Applied Epidemiology. (2) II. Mr. Reeves, Mr. Smith  
Discussion and lectures, one hour; laboratory, three hours. Separate discussion hours for undergraduate and graduate students.  
Prerequisite: course 147A or 245 and 162 or equivalent, or consent of instructor.  
Methods of investigating epidemics, collection, analysis, and reporting of data.
- †149. Advanced Problems in Epidemiology. (1-5) I and II. Mr. Hackett, Mr. Reeves, Mr. Smith  
Prerequisite: course 147B or consent of instructor.
- 150A. Clinical and Public Health Laboratory Procedures. (8) I. The Staff (Miss Hollinger in charge)  
Prerequisite: Biochemistry 102, Bacteriology 101, and consent of instructor. Enrollment limited to forty students.  
Basic principles and laboratory methods in clinical chemistry, hematology, and mycology, as required in clinical and public health practices.
- 150B. Clinical and Public Health Laboratory Procedures. (8) II. The Staff (Miss Beattie in charge)  
Prerequisite: Bacteriology 101, and consent of instructor.  
Enrollment limited to forty students.  
Laboratory identification of the etiological agents of communicable diseases and bacteriological and chemical examination of water, milk, and utensils.
- †154. Advanced Problems in Public Health Laboratory. (1-5) I and II.  
Prerequisite: consent of instructor. Miss Beattie, Miss Hollinger  
Special investigations of public health and clinical laboratory problems.
- \*155. Optical and Electrical Techniques. (2) II. Miss Hollinger  
Lecture, one hour; laboratory, to be arranged.  
Prerequisite: consent of instructor. Enrollment limited.  
The applications of optical and electrical methods to analysis in biological laboratories.
- 160A. Biometry. (3) I and II. Mr. Zippin  
Lectures, two hours; laboratory, three hours.  
Prerequisite: open only to students who have completed at least 8 units of laboratory courses in the biological sciences.  
Students who have completed courses in statistics may enroll only with the consent of the instructor.  
Elements of statistical analysis; introduction to the methods of statistical analysis and their applications in the fields of the biological sciences.
- 160B. Biometry. (3) II. Mr. Chiang  
Lectures, two hours; laboratory, three hours.  
Prerequisite: course 160A, or consent of instructor.  
Bivariate distributions, elementary methods of sampling, introduction to analysis of variance, special methods applicable to biological data.
- 161A. Applied Biostatistics. (3) I. Mrs. French  
Lectures, two hours; laboratory, four hours.  
Prerequisite: consent of instructor.  
Elements of vital statistics and demography. Includes consideration of problems of registration, enumeration, morbidity and mortality statistics.

\* Not to be given, 1954-1955.

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



- †161B. Applied Biostatistics. (4) II. Mr. Yerushalmy  
Lectures, two hours; laboratory, six hours.  
Prerequisite: course 161A.  
Extension of methods introduced in course 161A to more advanced problems. Methods of establishing record systems for health activities including case registers for chronic diseases; evaluation and analysis.
162. Public Health Statistics. (3) I and II. Mr. Yerushalmy, Mrs. French  
Lectures, two hours; laboratory, three hours.  
An applied course in public health statistics designed primarily for students in the School of Public Health not majoring in biostatistics. Fall semester enrollment limited to graduate students; spring semester to undergraduate students.
- †163. Demography. (2) II. The Staff (Mr. Yerushalmy in charge)  
Lecture, one hour; laboratory, three hours.  
Prerequisite: course 160A or 161A or consent of instructor.  
Introduction to demography and population problems.
- †164. Advanced Biometry. (2) I. The Staff (Mr. Yerushalmy in charge)  
Lecture, one hour; laboratory, three hours.  
Prerequisite: course 160B.  
Extension of methods introduced in course 160B including methods of small samples, analysis of variance.
- †169. Advanced Biostatistics. (1-5) I and II. The Staff (Mr. Yerushalmy in charge)  
Prerequisite: consent of instructor.
170. Introduction to Occupational Health and Industrial Hygiene. (3) I and II. Mr. Tebbens, Mr. Beard  
A survey of the field of industrial health and hygiene. Discussion of occupational hazards and their control; industrial safety; industrial health problems; and organizations concerned with industrial hygiene and health.
171. Industrial Environment Control: Sanitary Air Analysis. (2) II. Mr. Tebbens  
Prerequisite: Chemistry 5 or Civil Engineering 123 or equivalent; Physics 2A-2B or equivalent.  
Physical, chemical, and sanitary analysis of the condition of the air and other environmental factors affecting the health and welfare of workers in industry. Application of principles of sanitation in industry.
172. Industrial Toxicology. (2) II. Mr. Hine  
Prerequisite: Chemistry 5 and 9, Physics 2A-2B, Physiology 1-1L; or equivalent courses.  
Chemical and clinical laboratory techniques applied to investigation of toxic manifestations of industrial hazards.
186. Social, Medical, and Public Health Aspects of Venereal Disease Control. (2) I and II. Mr. Koch  
Discussion and field observation, two hours.  
Prerequisite: consent of instructor.  
Study of the social causes of the venereal diseases and remedial procedures; administrative control methods, etiology, epidemiology, and treatment; importance of family life education and health education pertaining to their control.

---

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

187. Medical Background for Public Health. (2) I. ———, Mr. Frost  
 Observation, six hours.  
 Prerequisite: consent of instructor.  
 Preventive and remedial medical practice illustrated by ward and clinic visits, conferences, and demonstrations. The nature of disease and the basis of therapy are presented to acquaint the nonmedical health worker with the major causes of morbidity.
189. Nutrition Problems in Public Health. (1) II. Miss Huenemann  
 Study of the application of nutrition knowledge to public health.
198. Directed Group Study. (1-5) I and II. The Staff (Mr. Smith in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 The Staff (Mr. Smith in charge)

## GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 10)
- 200A-200B. Principles of Public Health Organization and Administration.  
 (3-2) Yr. Mr. Rogers  
 A systematic study of the principles of organization and administration and of their application to public health practice.
202. Special Studies in Hospital Administration. (1-5) I and II.  
 Prerequisite: consent of instructor. Mr. Taylor  
 Special studies in the field of hospital administration under direction of the staff.
- 203A-203B. Seminar in Hospital Administration. (2-2) Yr.  
 Mr. K. O. Taylor, Mr. Stull
- 206A-206B. Seminar in Medical Care Administration. (2-2) Yr. Mr. Rogers  
 Limited to graduate students specializing in hospital or medical care administration, or by consent of instructor.  
 Detailed consideration of organization, operation, and appraisal of medical care programs.
- 209A-209B. Seminar in Public Health Administration. (1-1) Yr.  
 Mr. Rogers
213. Advanced Study in Sanitation. (1-5) I and II.  
 Mr. Mangold, Mr. Kaufman
- 214A-214B. Seminar in Sanitation. (2-2) Yr. Mr. Mangold
224. Seminar in Public Health Nursing Administration. (1) I and II.  
 Mrs. Fry
227. School Health Administration. (2) II.  
 Miss Bierman, Miss Nyswander, Miss Lindsay  
 Consideration of the principles basic to organization, administration, and supervision of school health programs in elementary and secondary schools. Health services, environmental factors, communicable disease control, and hygiene of the school day. Students will undertake field studies and will furnish their own transportation.
228. Special Studies in Maternal and Child Health. (1-5) I and II.  
 Miss Bierman  
 Special studies undertaken by students under the direction of the staff.
- 229A-229B. Seminar in Maternal and Child Health. (1-1) Yr.  
 Miss Bierman

231. Seminar in Mass Media Techniques of Health Education. (1) II.  
Prerequisite: consent of instructor. Mr. Griffiths, Miss Nyswander  
Problems associated with the use of mass media in health education.  
Field experience in evaluative procedures will be undertaken and new  
trends in the use of mass media will be reviewed.
233. Group Work Procedures in Health Education. (2) I. Miss Nyswander  
Prerequisite: open only to graduate students in public health.  
A consideration of the more usual techniques of group work together  
with investigations of the social and psychological factors which determine  
the effectiveness of group work in promoting public health activities.
- 234A-234B. Seminar in Community Health Education. (1-2) Yr.  
Mr. Griffiths  
Prerequisite: course 200A-200B (may be taken concurrently).  
Problems in relating the philosophy of health education to public  
health administration. Field observations and studies.
238. Seminar in Mental Health. (1) II. Mr. Zimmerman
239. Special Studies in Health Education. (1-5) I and II.  
Prerequisite: consent of instructor. Mr. Griffiths, Miss Nyswander  
Research projects in public health education.
245. Biology of Infectious Diseases (Epidemiology). (4) I.  
Mr. Reeves, Mr. Smith, Mr. Hackett  
Lectures and demonstrations, six hours.  
Prerequisite: an M.D. degree or consent of instructor for those with  
adequate background in medical bacteriology, immunology, and medical  
entomology. To be taken concurrently with course 162.  
Discussion of parasite, vector, reservoir host, and the infection chain.  
Consideration of most recent advances in microbiological laboratory meth-  
ods and interpretation of results, particularly as applied to epidemiolog-  
ical investigations.
- †248. Advanced Problems in Epidemiology. (1-5) I and II.  
Mr. Hackett, Mr. Reeves, Mr. Smith  
Prerequisite: courses 245 and 147B; 162 or 160A and 161A.
- †249A-249B. Seminar in Epidemiology. (1-1) Yr.  
Mr. Hackett, Mr. Reeves, Mr. Smith
- †254A-254B. Seminar in Public Health Laboratory Administration. (1-1) Yr.  
Miss Beattie, Miss Hollinger, Mr. Merrill
- †260. Biostatistics. (4) I. Mr. Yerushalmy  
Prerequisite: consent of instructor.  
Quantitative methods in medicine and public health primarily for  
graduate students specializing in biostatistics. Includes study of discrete  
and continuous distributions of a single variable, bivariate distributions,  
sampling.
262. Advanced Biostatistics. (3) II. Mr. Yerushalmy  
Lectures, two hours; laboratory, three hours.  
Prerequisite: course 260.  
Extension of methods introduced in course 260 to more advanced prob-  
lems.
- †268. Special Studies in Biostatistics. (1-5) I and II.  
The Staff (Mr. Yerushalmy in charge)  
Research projects undertaken by students under the direction of the  
staff.

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

- †269A-269B. Seminar in Biostatistics. (1-1) Yr.  
The Staff (Mr. Yerushalmy in charge)
- †274A-274B. Seminar in Industrial Health. (1-2) Yr.  
Mr. Beard, Mr. Tebbens
278. Special Studies in Industrial Health. (1-5) I and II.  
Mr. Tebbens, Mr. Beard, Mr. Hine  
Prerequisite: graduate status; consent of instructor.  
Research projects in industrial environment control, industrial toxicology, sanitary air analysis, or industrial medical administration.
- \*284A-284B. Seminar in Public Health Dentistry. (1-1) Yr. ———
287. Clinical Problems in Public Health. (1-4) I and II. Mr. Smith  
Deals with selected clinical subjects of major importance to public health and presents clinical observations and discussions of the most recent advances in diagnosis, treatment, and prevention.
- 289A-289B. Seminar in Public Health Nutrition. (2-2) Yr.  
Miss Huenemann
297. Directed Field Study. (No credit.) Given immediately following the close of each semester.  
The Staff (Mr. Smith in charge)
298. Directed Group Study for Graduate Students. (1-5) I and II.  
The Staff (Mr. Smith in charge)
299. Special Study for Graduate Students. (1-5) I and II.  
The Staff (Mr. Smith in charge)

## RANGE MANAGEMENT

(Department Office, 243 Forestry Building)

### *Committee in Charge:*

Frederick S. Baker, F.E., *Professor of Forestry (Chairman of the Committee).*

Harold H. Biswell, Ph.D., *Professor of Forestry.*

Floyd D. Carroll, Ph.D., *Assistant Professor of Animal Husbandry, Davis.*

John P. Conrad, Ph.D., *Professor of Agronomy, Davis.*

Alden S. Crafts, Ph.D., *Professor of Botany, Davis.*

Robert L. Crocker, Ph.D., D.Sc., *Professor of Soil Morphology.*

Harold F. Heady, Ph.D., *Assistant Professor of Forestry.*

Horton M. Laude, Ph.D., *Associate Professor of Agronomy, Davis.*

A. Starker Leopold, Ph.D., *Associate Professor of Zoology.*

Glen P. Lofgreen, Ph.D., *Assistant Professor of Animal Husbandry, Davis.*

R. Merton Love, Ph.D., *Professor of Agronomy, Davis.*

Maurice L. Peterson, Ph.D., *Associate Professor of Agronomy, Davis.*

Carl O. Sauer, Ph.D., *Professor of Geography.*

Edward C. Stone, Ph.D., *Assistant Professor of Forestry.*

Henry J. Vaux, Ph.D., *Professor of Forestry.*

\* Not to be given, 1954-1955.

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

Frank J. Veihmeyer, C.E., Ph.D., *Professor of Irrigation, Emeritus, Davis.*  
 William C. Weir, Ph.D., *Associate Professor of Animal Husbandry, Davis.*

William A. Williams, Ph.D., *Lecturer in Agronomy, Davis.*

Instruction in range management is not organized as a single administrative unit in the University, but the relevant courses are offered by a number of departments at Berkeley and at Davis, and are coordinated by the committee in charge.

*Major Adviser:* Mr. Heady.

#### LOWER DIVISION COURSE

49. Range Management Field Practice Course. (No credit) Mr. Heady  
 (Formerly Forestry 49R.)

Six weeks devoted to field studies of range conditions and methods of utilization in various parts of the state. Required of all students with a major in range management.

#### UPPER DIVISION COURSES

101. Introduction to Range Management. (3) I. Mr. Biswell  
 (Formerly Forestry 101.)

Basic principles of range management and development in the United States; relation to agriculture and wildland management.

102. Range Management Technique. (3) II. Mr. Heady  
 (Formerly Forestry 102.)

Lecture and laboratory.

Prerequisite: Engineering 1A; Forestry 103. Recommended: Botany 108.

Field and laboratory procedure in determination of range adequacy and quality. Special field trips will be arranged.

123. Range Forage Utilization. (3) I. Mr. Biswell  
 (Formerly Forestry 123.)

Lectures and laboratory.

Prerequisite: course 49 or 101.

Principles of range forage utilization and effects; forage preference of animals; control means to obtain proper utilization. Special field trips will be arranged.

133. Grassland Ecology. (3) II. Mr. Heady  
 (Formerly Forestry 133.)

Prerequisite: Forestry 103.

Composition, structure, development, and habitat factors of the native North American grasslands. Principles of grassland management for forage production.

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

Prerequisite: senior standing and consent of instructor.

#### GRADUATE COURSES

- 200A-200B. Research in Range Management. (1-6; 1-6) Yr.  
 The Staff (Mr. Biswell in charge)

Course 200A is not prerequisite to 200B.

- 201A-201B. Seminar in Range Management. (2-2) Yr.  
 (Formerly Forestry 208A-208B.) The Staff (Mr. Biswell in charge)

Course 201A is not prerequisite to 201B.

## ROMANCE PHILOLOGY

Francis J. Carmody, Ph.D., *Professor of French.*

Ronald N. Walpole, Ph.D., *Professor of French.*

Yakov Malkiel, Ph.D., *Professor of Romance Philology.*

*Departmental Major Adviser:* Mr. Malkiel.

200. Linguistic History of the Roman Empire. (2) I. Mr. Malkiel  
 The external history of the spread of Latin over the Western Mediterranean area, its gradual diversification, and change into the Romance dialects, with emphasis on substrata and superstrata.
- \*201. Late Latin Language and Literature. (2) I. Mr. Malkiel  
 The internal history of colloquial Latin and Late Latin, down to the Carolingian period, on the basis of original sources.
- \*202. General Romance Linguistics. (2) II. Mr. Malkiel  
 Prerequisite: graduate standing and undergraduate major in languages.  
 Problems of methodology in historical linguistic reconstruction, applied to the major and minor Romance languages.
- 203A-203B. Old Provençal. (2-2) Yr. Mr. Walpole  
 An introductory study of Old Provençal language and literature, with emphasis on the form and content of the different literary genres and on questions of cultural origins and influences.
- \*205. Linguistic Geography Applied to Romance Dialectology. (2) I. Mr. Malkiel  
 This course is designed to introduce to students the methods of interpreting maps of linguistic atlases (with special reference to Romance-speaking countries) and of using them as a basis for various types of dialectological studies.
206. Medieval Latin and Romance Learning. (2) II. Mr. Carmody  
 Prerequisite: consent of instructor.  
 Interpretation of original texts in Latin, Old French, and Old Spanish and the cultural problems involved in their transmission.
299. Special Advanced Study. (1-4) I and II. Mr. Carmody, Mr. Malkiel, Mr. Walpole

### RELATED COURSES IN OTHER DEPARTMENTS

Historical French Grammar (French 201A-201B).

Reading and Interpretation of Typical Old French Texts (French 206A-206B).

Old Spanish (Spanish 212A-212B).

\* Not to be given, 1954-1955.

## SCANDINAVIAN

(Department Office, 1218 Dwinelle Hall)

Assar Götrik Janzén, Ph.D., *Professor of Scandinavian (Chairman of the Department)*.

Håkon Hamre, *Associate Professor of Scandinavian*.



Arthur G. Brodeur, Ph.D., *Professor of Germanic Philology and English*.

Madison S. Beeler, Ph.D., *Associate Professor of German*.

Margrethe Schioler, M.A., *Lecturer in Scandinavian*.

*Letters and Science List.*—All undergraduate courses in Scandinavian are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Janzén.

*Preparation for the Major.*—At least 8 units from the lower division course sequences 1A-1B, 3A-3B, 4A-4B; or the equivalent.

*The Major.*—Twenty-four units in upper division courses, including at least 9 units made up from courses 101A-101B, 103A-103B, 104A-104B, 111, 113, 114. Six of the 24 units may be in related work in other departments.

*Honors.*—Candidates for honors must do distinguished work in 24 units of upper division courses, as outlined in the requirements for the major.

### LOWER DIVISION COURSES

- |   |               |
|---|---------------|
| 1A-1B. Elementary Swedish. (4-4) Yr.                        | Mr. Janzén    |
| 1A. Elementary grammar, reading of easy prose.              |               |
| 1B. Elementary grammar, reading, conversation, composition. |               |
| 3A-3B. Elementary Norwegian. (4-4) Yr.                      | Mr. Hamre     |
| 3A. Elementary grammar, reading of easy prose.              |               |
| 3B. Elementary grammar, reading, conversation, composition. |               |
| 4A-4B. Elementary Danish. (4-4) Yr.                         | Miss Schioler |
| 4A. Elementary grammar, reading of easy prose.              |               |
| 4B. Elementary grammar, reading, conversation, composition. |               |

### UPPER DIVISION COURSES

#### I

- |   |               |
|---|---------------|
| *101A-101B. Advanced Swedish (4-4) Yr.  | Mr. Janzén    |
| Prerequisite: course 1A-1B or equivalent.   |               |
| Advanced grammar with emphasis on syntax and phraseology, reading, conversation, composition. |               |
| 103A-103B. Advanced Norwegian. (4-4) Yr.  | Mr. Hamre     |
| Prerequisite: course 3A-3B or equivalent.   |               |
| Advanced grammar with emphasis on syntax and phraseology, reading, conversation, composition. |               |
| 104A-104B. Advanced Danish. (4-4) Yr.   | Miss Schioler |
| Prerequisite: course 4A-4B or equivalent.   |               |
| Advanced grammar with emphasis on syntax and phraseology, reading, conversation, composition. |               |
| *111. Swedish Poets of the Nineteenth Century. (1) II.  | Mr. Janzén    |
| Prerequisite: a reading knowledge of Swedish.   |               |

\* Not to be given, 1954-1955.

- \*113. Romanticism in Norway. (1) II. Mr. Hamre  
Prerequisite: a reading knowledge of Norwegian.
- \*114. Holberg and Oehlenschläger. (1) II. Miss Schioler  
Prerequisite: a reading knowledge of Danish.
- \*121. Conversational Swedish. (1) I. Mr. Janzén  
Prerequisite: course 1A-1B.
- \*123. Conversational Norwegian. (1) I. Mr. Hamre  
Prerequisite: course 3A-3B.
- \*124. Conversational Danish. (1) I. Miss Schioler  
Prerequisite: course 4A-4B.

## II

## COURSES WHICH REQUIRE NO KNOWLEDGE OF A SCANDINAVIAN LANGUAGE

- 100A-100B. History of Scandinavian Literature. (3-3). Mr. Janzén  
Survey course: reading of selected works of Danish, Norwegian, and Swedish literature in translation; lectures.  
100A. From the oldest times up to 1800.  
100B. 1800 to the present.  
Course 100A is not prerequisite to 100B.
- \*106. History of Scandinavian Drama up to 1900. (2) I. Mr. Hamre  
Reading of Danish, Norwegian, and Swedish plays in translation; discussions; lectures on the development of the drama.
- \*107. The Plays of Ibsen. (3) I. Mr. Janzén  
Reading and discussion of Ibsen's most important plays; lectures.
108. Strindberg and His Writings. (3) II. Mr. Janzén  
Reading and discussion of the most important of Strindberg's works in connection with his biography.
- \*109. Scandinavian Drama of the Twentieth Century. (2) II. Mr. Hamre  
Reading of modern Scandinavian dramas in translations; discussions; lectures.
- 120A-120B. The Novel in Scandinavia. (3-3) Yr. Miss Schioler  
Reading and discussion of great Scandinavian novels; lectures on the development of the novel. Course 120A is not prerequisite to 120B.
125. Masterpieces of Old Norse Literature. (3) I. Mr. Janzén  
Reading and discussion of some of the sagas and representative selections from the Eddas and the Scaldic songs; lectures on Scandinavian literature in the Middle Ages.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
The Staff (Mr. Janzén in charge)

## GRADUATE COURSE

(Concerning conditions for admission to graduate courses, see page 10)

298. Special Study for Graduate Students. (1-4) I and II.  
Mr. Janzén, Mr. Hamre

\* Not to be given, 1954-1955.



## RELATED COURSES IN OTHER DEPARTMENTS

- Romanticism in Western Europe (Comparative Literature 121).  
 The Theater in Western Civilization (Dramatic Art 140A-140B).  
 The Novel in Western Civilization (English 125B).  
 Early German Romanticism (German 228).  
 German Realism, 1850-1900 (German 238).  
 Germanic Linguistics (German 260).  
 Gothic (German 265).  
 Introduction to General Linguistics (Linguistics 100).  
 Introduction to Indo-European Comparative Grammar (Linguistics 150).

**SLAVIC LANGUAGES AND LITERATURES**

(Department Office, 4118 Dwinelle Hall)

- Waclaw Lednicki, Ph.D., *Professor of Slavic Languages and Literatures*  
*(Chairman of the Department)*.  
 Gleb Struve, B.A. (Oxon.), *Professor of Slavic Languages and Literatures*.  
 Oleg A. Maslenikov, Ph.D., *Associate Professor of Slavic Languages and Lit-*  
*eratures*.  
 Francis J. Whitfield, Ph.D., *Associate Professor of Slavic Languages and*  
*Literatures*.  
 Lawrence L. Thomas, Ph.D., *Instructor in Slavic Languages*.  
 Michael K. Pawlikowski, LL.M., *Associate in Polish and Russian*.  
 Herman Ermolaev, M.A., *Associate in Russian*.



- Ante Kadić, Ph.D., *Lecturer in Serbo-Croatian*.  
 Ludmilla A. Patrick, M.A., *Lecturer in Russian*.  
 Božena Pospishil, Ph.D., *Lecturer in Czech*.

*Letters and Science List*.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser*: Mr. Whitfield.

*The Major*.—Required: 24 upper division units, including courses 130 or 133A, and 140 and at least 12 units in language courses in the department; not more than 6 units may be chosen from other departments. Courses in other departments that will be accepted as part of the major are upper division courses in the Greek, Latin, or Gothic languages, in phonetics or comparative linguistics, and any upper division courses in European literature, or in history, that may be specifically approved by the department as combining properly with the work in Slavic languages and literatures. Such courses are, for example, those given by the English Department on the novel and on nineteenth-century poetry, and by the History Department on modern European history, particularly the history of Eastern Europe.

*Honor Students in the Upper Division*.—Candidates for honors must take at least 24 units of upper division work in the department, of which at least 12 units must be of grade A and the remaining 12 units must average not below grade B. The 24 units must include at least 18 units of work in upper division language courses in the department.

## LOWER DIVISION COURSES

1. Elementary Russian. Beginners' Course. (4) I and II.

Mr. Thomas in charge

Two lectures and three recitation hours per week. The conversation course of corresponding level is 18A.

2. Elementary Russian (continuation of 1). (4) I and II.  
Prerequisite: course 1. Mrs. Patrick in charge  
Two lectures and three recitation hours per week. The conversation course of corresponding level is 18B.
3. Intermediate Russian. (3) I and II.  
Mrs. Patrick, Mr. Pawlikowski, Mr. Whitfield  
(Formerly course 102A.)  
Prerequisite: course 2.  
Reading, composition, translation. The conversation course of corresponding level is 19.
- 5A-5B. Elementary Ukrainian. (3-3) Yr. Mr. Thomas
- 6A-6B. Elementary Polish. (3-3) Yr. Mr. Thomas
- 10A-10B. Elementary Serbo-Croatian. (3-3) Yr. Mr. Kadić
- \*12A-12B. Elementary Bulgarian. (3-3) Yr. Mr. Whitfield
- 14A-14B. Elementary Czech. (3-3) Yr. Miss Pospishil
- 18A. Elementary Russian Conversation. (2) I and II. Mr. Ermolaev  
Prerequisite: course 1 (may be taken concurrently).
- 18B. Elementary Russian Conversation. (2) I and II. Mr. Ermolaev  
Prerequisite: course 2 (may be taken concurrently).
19. Intermediate Russian Conversation. (2) I and II. Mr. Pawlikowski  
(Formerly course 119A.)  
Prerequisite: course 3 (may be taken concurrently).
30. Great Writers of Russian Literature. (3) I. Mr. Maslenikov  
No knowledge of Russian is required.

## UPPER DIVISION COURSES

## A. Language Courses

102. Intensive Russian Reading, Grammar, and Composition. (3) II.  
(Formerly course 102B.) Mr. Maslenikov  
Prerequisite: course 3.  
The conversation course of corresponding level is 119.
- 103A-103B. Advanced Russian. (3-3) Yr. Mrs. Patrick  
Prerequisite: course 102.  
The conversation course of corresponding level is 120.
104. Russian Composition. (3) I. Mr. Struve  
(Formerly course 104A.)  
Prerequisite: course 103B.
105. Written Translation from Slavic Languages. (1-3) I and II.  
The Staff (Mr. Whitfield in charge)  
May be taken only in combination with some other advanced course in Slavic languages.
- 107A-107B. Intensive Polish Reading, Grammar, and Composition. (3-3) Yr.  
Prerequisite: course 6B. Mr. Pawlikowski
108. Advanced Studies in Polish Grammar. (3) II. Mr. Thomas  
Prerequisite: course 107B.

\* Not to be given, 1954-1955; to be given, 1955-1956.

- 111A-111B. Intensive Serbo-Croatian Reading, Grammar, and Composition. (3-3) Yr. Mr. Kadić  
Prerequisite: course 10B.
112. Advanced Studies in Serbo-Croatian Grammar. (3) I. Mr. Kadić  
Prerequisite: course 111B.
- 115A-115B. Intensive Czech Reading, Grammar, and Composition. (3-3) Yr. Miss Pospishil  
Prerequisite: course 14B.
116. Advanced Studies in Czech Grammar. (3) II. Miss Pospishil  
Prerequisite: course 115B.
119. Advanced Russian Conversation. (2) II. Mr. Pawlikowski  
(Formerly course 119B.)  
Prerequisite: course 102 (may be taken concurrently).
120. Advanced Russian Conversation (continuation of 119). (2) I. Mr. Pawlikowski  
(Formerly course 120A.)  
Prerequisite: course 103 (may be taken concurrently).
124. Advanced Russian Composition. (3) II. Mrs. Patrick  
(Formerly course 124A.)  
Prerequisite: course 104.
125. Specialized Russian Reading. (3) I. Mr. Thomas  
Prerequisite: course 3 or consent of instructor.  
Rapid reading of texts in the natural and social sciences.

#### B. Lecture Courses on Slavic Literatures

Except where otherwise indicated, these courses require no knowledge of any language other than English. They are open to all students of at least junior standing and, with the consent of the instructor, to properly qualified sophomores.

- \*130. Introduction to Russian Literature. (3) I. Mr. Struve  
Survey of Russian literature and intellectual trends.
131. Russian Literature (1880-1917). (3) II. Mr. Maslenikov  
Garshin, Chekhov, Gorky, Andreyev, Bunin, Kuprin, Korolenko, the Symbolists, and others.
132. Russian Literature Since 1917. (2) II. Mr. Struve
- 133A. Russian Novelists of the Nineteenth Century and Western European Literatures. (3) I. Mr. Lednicki  
Emphasis will be placed on the influence of western European literatures on the development of the Russian novel. Tolstoy and Dostoevsky are not included.
- 133C. Dostoevsky. (3) II. Mr. Lednicki
- \*133D. Tolstoy. (3) I. Mr. Lednicki
- \*133F. Chekhov. (2) II. Mr. Struve
134. Russian Folklore. (2) I. Mrs. Patrick
- \*135. The Russian Drama. (2) I. Mrs. Patrick  
Survey of Russian drama from the seventeenth century to the twentieth.
140. Survey of Slavic Literatures. (2) I. Mr. Whitfield

\* Not to be given, 1954-1955; to be given, 1955-1956.

151. Polish Literature: Sixteenth-Eighteenth Centuries. (3) I.  
 Mr. Lednicki  
 Polish writers of the Golden Age (sixteenth century); of the seven-  
 teenth century; and of the Renaissance of the eighteenth century.
153. Polish Literature of the Post-Romantic Period. (2) II. Mr. Lednicki  
 Novelists of the period of Positivism, and Young Poland.
- \*154. Polish and Russian Romanticism. (2) II. Mr. Lednicki
- \*160. Survey of Czech and Slovak Literature. (2) I. Miss Pospishil  
 The development of Czech and Slovak literature from the sixteenth  
 century to the present.
- \*161. Czech and Slovak Literature of the Nineteenth Century. (2) II.  
 Miss Pospishil
- \*170. Survey of South Slavic Literatures. (2) II. Mr. Kadić
- 180A-180B. Survey of Russian Culture. (2-2) Yr. Mr. Struve  
 180A. Origin of Russian culture and its peculiarities. Eastern and  
 Byzantine influences. Rapprochement with the West and development of  
 a national consciousness, literature, art, religion, science, and social insti-  
 tutions in the seventeenth and eighteenth centuries.  
 180B. Development of Russian material, social, and spiritual culture  
 since the beginning of the nineteenth century and its features before  
 and after the Revolution.
- \*182. History of Polish Culture. (2) II. Mr. Lednicki  
 Development of the arts, thought, and institutions of Poland.
187. Russian Poetry. (2) II. Mr. Struve  
 Prerequisite: course 103A, or consent of instructor.  
 Lecture course given in Russian.
- \*188. The Slavic-Speaking World. (2) I. Mr. Lednicki
198. Advanced Group Work (1-3) I and II.  
 The Staff (Mr. Lednicki in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 The Staff (Mr. Lednicki in charge)

## GRADUATE COURSES

## Language Courses

- \*220. Comparative Slavic Linguistics. (2) II. Mr. Whitfield
224. Old Church Slavic. (3) I. Mr. Whitfield
225. Medieval Slavic Texts. (2) II. Mr. Whitfield
- \*226. Historical Russian Grammar. (2) I. Mr. Maslenikov
227. Historical Polish Grammar. (2) I. Mr. Whitfield
228. Historical Serbo-Croatian Grammar. (2) II. Mr. Whitfield
- \*229. Historical Czech Grammar. (2) I. Mr. Whitfield
- \*231. History of the Russian Language. (2) II. Mr. Struve

\* Not to be given, 1954-1955; to be given, 1955-1956.

- 232A. Russian Phonetics and Phonemics. (2) I. Mr. Maslenikov  
 232B. Russian Morphology. (2) II. Mr. Maslenikov  
 \*232C. Russian Syntax. (2) II. Mr. Whitfield

## Literature Courses

- \*237. Early Russian Literature. (2) II. Mr. Maslenikov  
 \*238. Eighteenth-Century Russian Literature. (2) II. Mr. Struve  
 \*240. Seminar in Russian Poetry of the Nineteenth Century. (2) II.  
 Mr. Lednicki  
 \*242. Analysis of Russian Literature Texts. (2) I. Mr. Lednicki  
 245. Seminar in the Russian Novel of the Nineteenth Century. (2) II.  
 Mr. Lednicki  
 246. Seminar in Twentieth-Century Russian Literature. (2) I. Mr. Struve  
 \*247. Seminar in the Russian Critics. (2) I. Mr. Struve  
 248. Seminar in the Symbolist Movement. (2) I. Mr. Maslenikov  
 \*285. Russian Prose. (2) II. Mr. Lednicki  
 Lecture course given in Russian.  
 \*288. Seminar in Polish Literature. (2) I. Mr. Lednicki  
 289. Seminar in South Slavic Literature. (2) I. Mr. Kadić  
 290. Seminar in Czech and Slovak Literature. (2) I. Miss Pospishil  
 298. Individual Work. (1-4) I and II. The Staff (Mr. Lednicki in charge)  
 Graduate students will be offered opportunities for independent reading and study. Credit will be assigned according to the amount of work done.

## SOCIAL WELFARE

(Department Office, 222 Building T-1)

- Milton Chernin, Ph.D., *Professor of Social Welfare (Chairman of the Department)*.  
 Davis McEntire, Ph.D., *Professor of Social Welfare*.  
 Gertrude Wilson, M.A., *Professor of Social Welfare*.  
 Ruth Cooper, D.S.W., *Associate Professor of Social Welfare*.  
 Walter Friedlander, Ph.D., *Associate Professor of Social Welfare*.  
 Ernest Greenwood, Ph.D., *Associate Professor of Social Welfare*.  
 Gordon Hearn, Ph.D., *Associate Professor of Social Welfare*.  
 Henry S. Maas, Ph.D., *Associate Professor of Social Welfare*.  
 Maurine McKeany, Ph.D., *Associate Professor of Social Welfare and Supervisor of Field Work*.  
 Barbara E. Judkins, M.S., *Assistant Professor of Social Welfare*.  
 \*Elliot Studt, M.A., *Assistant Professor of Social Welfare*.  
 Kermit T. Wiltse, D.S.W., *Assistant Professor of Social Welfare*.



- Anna Maenchen, Ph.D., *Lecturer in Social Welfare*.  
 Marjorie Montelius, M.S.W., *Lecturer in Social Welfare and Field Work Consultant*.

\* Not to be given, 1954-1955; to be given, 1955-1956.

\* In residence spring semester only, 1954-1955.

Eli R. Movitt, M.D., *Lecturer in Social Welfare.*

Lydia G. Nolan, M.S., *Lecturer in Social Welfare and Field Work Supervisor.*

Margaret S. Schubert, M.A., *Lecturer in Social Welfare and Field Work Consultant.*

Lulu Scott, M.S.S., *Lecturer in Social Welfare and Field Work Supervisor.*

Hasseltine Byrd Taylor, J.D., Ph.D., *Lecturer in Social Welfare.*

Ernestine Wertheimer, M.S.S., *Lecturer in Social Welfare and Field Work Supervisor.*



Portia Bell Hume, M.D., *Assistant Clinical Professor of Psychiatry.*

Audrey Schumacher, Ph.D., *Associate Clinical Professor of Psychology.*

Alexander Simon, M.D., *Professor of Psychiatry.*

Emanuel Windholz, M.D., *Associate Clinical Professor of Psychiatry.*

Kent Zimmerman, M.D., *Lecturer in Social Welfare and Lecturer in Public Health.*

The School of Social Welfare administers a two-year graduate program of education for social work, leading to the degree of Master of Social Welfare. For information regarding admission to and requirements prescribed for the graduate program, see the ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE.

The department administers the group major in social welfare (in the College of Letters and Science), a preprofessional preparatory program, which is described in the CIRCULAR OF INFORMATION.

*Letters and Science List.*—Courses 100, 106, and 110A–110B are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

#### UPPER DIVISION COURSES

##### 100. The Field of Social Welfare. (3) I and II.

Mr. Chernin

A survey of the field of social welfare and social work functions. The rise of modern social work and the distinctive techniques of the social work profession. Designed to acquaint undergraduates and nonprofessional students with the field of social welfare. Not open to students who are taking or have completed course 110A–110B.

##### 102. Methods in Social Work. (3) I and II.

Mrs. Wertheimer

Prerequisite: for students in the social welfare major, senior standing and course 110A (may be taken concurrently); others, course 110A (may be taken concurrently) or course 100, and consent of instructor.

An introduction to social work methods, including social case work, social group work, and community organization for social welfare. Designed to acquaint students with the basic philosophy, concepts, and applications of these methods. Observational visits to social agencies and institutions will be arranged.

##### \*106. Community. (2) II.

The concept of community; the major institutions of the modern community; community surveys in the United States; how to study the community; the sociological background of "community organization."

\* Not to be given, 1954–1955.

- 110A-110B. The Social Services. (3-3) Yr. Mr. Friedlander  
 Course 110A is prerequisite to 110B.  
 110A. Basic concepts of the social services; history of their development in England and the United States from the British Poor Law to the present.  
 110B. Present system of social services in the United States. Problems of organization and administration of public assistance, child welfare, medical care, mental hygiene, corrections, veterans' services, and social insurance.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
 The Staff (Mr. Friedlander in charge)  
 Prerequisite: senior standing and approval of the major adviser.  
 Individual readings, research, and conferences with the instructor in a field chosen by the student with approval of the instructor.

## GRADUATE AND PROFESSIONAL COURSES

These courses are intended primarily for students enrolled in the graduate program of the department, and are limited to such students except by permission of the department.

201. Law and Social Welfare. (1) I and II. Mrs. Taylor  
 Legal information for social workers; the sources of California laws. The courts of California; fundamentals of law governing domestic relations, neglected and dependent children, delinquents, landlord and tenant, etc.; problems of legal procedure.
- 202A-202B. Social Case Work. (2-2) Yr.  
 Mrs. Nolan, Mrs. Schubert, Miss Scott  
 Introduction to the study and practice of social case work.
203. Community Organization. (2) I. Miss Wilson  
 A study of the social resources of the community and of methods of organizing these resources for the meeting of human needs.
- 205A-205B. Growth and Change of the Individual. (2-2) Yr.  
 Mr. Maas (in charge), Miss Cooper, Mrs. Hume,  
 Mr. Movitt, Mr. Zimmerman  
 Basic facts, theories, and problems in the physiological, psychological, and social development of the individual, with emphasis on adaptation to stress, as related to social welfare.  
 205A. From conception through adolescence.  
 205B. From adulthood through senescence.
207. Social Welfare Organization. (2) I and II. Mrs. Taylor, Mr. Wiltse  
 Major concepts of organization and administrative relationships in the public and private social welfare programs.
208. Social Welfare and Income Maintenance. (2) I and II.  
 Mr. Friedlander, Miss McKeany  
 Critical and evaluative study of social welfare policies, methods, problems, and issues in the use of public assistance and social insurance programs to maintain income.
252. Public Welfare Administration. (2) I. Mrs. Taylor  
 (Formerly numbered 252B.)  
 The administrative process within the public welfare agency. Problems of administration.

253. Family and Child Welfare Services. (2) I. Mr. Wiltse  
The development, organization, and administration of specific family and child welfare services, including family and marital counseling, and programs for the care and protection of dependent and neglected children.
254. Medical Social Work. (2) II. Miss Cooper, ———  
The development, organization, and administration of medical social service functions in institutional and extramural settings.
- 257A-257B. The Treatment of Delinquency. (2-2) Yr. Mr. Chernin  
257A. Institutional treatment; history and development of penal and correctional institutions for adults and juveniles; theories and programs of treatment; organization and administration of correctional services.  
257B. Noninstitutional treatment, probation, and parole; theory and development of probation, parole, and the indeterminate sentence; the organization and administration of parole and probation services.
- 258A-258B. Advanced Social Case Work. (2-2) Yr.  
Miss Cooper, Miss Judkins, Mrs. Wertheimer, Mr. Wiltse  
258A. Assignment to sections according to field work placement as follows: corrections; family and child welfare; medical; psychiatric. Emphasis on particular knowledge required in social case work practice in these settings, including organization and administrative structure.  
258B. Each section includes students from all settings; emphasis on common elements of social case work practice.
259. Principles and Methods of Supervision in Social Welfare. (2) II. Miss Wilson  
Prerequisite: completion of one year of education in a recognized school of social work, including a case work or group work and field work sequence.  
Educational and psychological principles involved in supervision; purposes, possibilities, and current practices of supervision in social agencies; critical evaluation of supervising case material drawn from present practice.
261. Clinical Psychology and Social Work. (1) I. Mrs. Schumacher  
The relationship of theories and methods in clinical psychology to social work practice.
262. Psychiatry and Social Work. (2) I. Mrs. Hume, Mr. Simon  
The diagnosis and treatment of the psychoneuroses, neuroses, psychoses, and mental deficiencies, and their social implications. Various schools of psychiatric thought.
265. Social Welfare Research. (2) I and II. Mr. Greenwood  
Prerequisite: Economics 2 or Psychology 5 or equivalent.  
Fields and methods of social welfare research; techniques of collecting data; analytical methods.
266. Psychoanalysis and Social Work. (2) II. Mrs. Maenchen, Mr. Windholz  
The contribution of psychoanalytic theory to social work.
280. Introduction to Social Group Work. (2) I and II. Mr. Hearn  
Nature of the group work process as a basic method in social work; its application in various settings; psychological bases of group action and leadership. For non-group work students in the School of Social Welfare and graduate students in other departments.



- 281A-281B. Social Group Work. (2-2) Yr. Miss Montelius  
Introduction to the study and practice of social group work. Primarily for social group work students in the School of Social Welfare.
- 282A-282B. Social Group Work Theory and Its Application. (2-2) Yr.  
Prerequisite: course 281A-281B. Mr. Hearn  
282A. The scientific bases of group behavior.  
282B. Application of group work theory to practice and administration in diverse social welfare settings.
- \*283. Advanced Seminar in Group Work. (2) I. \_\_\_\_\_  
Professional, theoretical, and research problems in group work theory and practice. For advanced group work students.
291. International Social Services. (2) I. Mr. Friedlander  
An examination of the international social agencies and their activities. Comparative analysis of the development and main characteristics of the system of public and private social services in selected foreign countries.
- \*292. Cultural and Social Aspects of Social Welfare Practice. (2) II. \_\_\_\_\_  
Prerequisite: open to graduate students in any school or department whose interest and research is concerned with such problems, and who have consent of the instructor.  
Intensive survey of the relationships of diverse social and cultural backgrounds of groups (ethnic, racial, religious, class, caste) in the United States to the problems and practice of professional social work.
293. Seminar on Social Security. (2) II. Mr. Friedlander  
Prerequisite: Economics 185 or an equivalent course in social insurance.  
Advanced study and research in social security; special emphasis on relationships between the social insurances and social welfare programs.
295. Seminar in Research Problems and Methods. (2) II. Mr. McEntire  
Prerequisite: course 265 or equivalent, and consent of instructor.  
Selection and definition of research problems; design of social surveys and experiments; methodological problems.
298. Special Studies. (1-6) I and II.  
Mr. Chernin (in charge), Mr. Greenwood,  
Mrs. Studt, Mrs. Wertheimer  
Individual or group study, with emphasis on original research, as may be arranged.
299. Special Research. (2) I and II.  
Mr. Greenwood, Mr. Maas, Mr. McEntire  
Group research on selected problems in social welfare. Open to candidates for the degree of Master of Social Welfare who have completed course 265 or equivalent.
401. Field Work. (2-10) I and II. The Staff (Miss McKeany in charge)  
Field work in social agencies under supervision, as prescribed and arranged by the staff. The normal program for first-year students is 400 hours of supervised work (two days per week during two semesters), for which 8 units of credit are granted; for less work, proportionately less credit is allowed. For second-year students, advanced field practice in

specialized types of social work, to be offered two or three days a week during each semester, or to be arranged in periods of continuous work, is normally required. Field work arrangements vary in extent and credit in accordance with the needs of individual students.

410. Program Media in Social Group Work. (1) I and II. Miss Montelius Practice in various program media of importance to social group work; the meaning and use of skills in social group work programs. Limited to students in the School of Social Welfare.

\*Conference on Social Welfare. (No credit) I and II.

The Staff (——— in charge)

Lectures and discussion on current problems in social welfare by members of the staff and by visitors.

## **SOCIOLOGY AND SOCIAL INSTITUTIONS**

(Department Office, 206 South Hall)

Herbert G. Blumer, Ph.D., *Professor of Sociology and Social Institutions (Chairman of the Department)*.

Wolfram Eberhard, Ph.D., *Professor of Sociology and Social Institutions*.

†Margaret T. Hodgen, Ph.D., *Professor of Sociology and Social Institutions*.  
Reinhard Bendix, Ph.D., *Associate Professor of Sociology and Social Institutions*.

Philip Selznick, Ph.D., *Associate Professor of Sociology and Social Institutions*.

Kenneth E. Bock, Ph.D., *Assistant Professor of Sociology and Social Institutions*.

†William A. Kornhauser, Ph.D., *Assistant Professor of Sociology and Social Institutions*.

Duncan MacRae, Jr., Ph.D., *Assistant Professor of Sociology and Social Institutions*.

William Petersen, Ph.D., *Acting Assistant Professor of Sociology and Social Institutions*.

<sup>1</sup>Tamotsu Shibutani, Ph.D., *Assistant Professor of Sociology and Social Institutions*.



Donald F. Foley, Ph.D., *Lecturer in City and Regional Planning*.

Cesar Grana, M.A., *Lecturer in Sociology and Social Institutions*.

*Letters and Science List.*—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Bock.

*Preparation for the Major.*—Required: courses 1, 2. Recommended: Anthropology 2A–2B, Economics 1A–1B, History 4A–4B, Philosophy 20A–20B, Psychology 1A–1B.

*The Major.*—Required: 24 units in the upper division to be chosen from at least three of Groups A, B, C, D, E, F, with a maximum of 9 units in any group chosen. Six units may be chosen outside of the department. All choices must be approved by the departmental major adviser. The completion of the major will require the maintenance of at least a C average.

\* Not to be given, 1954–1955.

† Absent on leave, 1954–1955.

<sup>1</sup> In residence fall semester only, 1954–1955.

## LOWER DIVISION COURSES

1. Man and Society. (3) I. Mr. Blumer  
Two lectures; one weekly discussion section to be arranged.  
An introduction to sociology. Analysis of human group life through principles, concepts and theories: culture, institutions, community, collective behavior, personality, social roles, social disorganization, social planning, etc.
2. Society and Wealth. (3) II. Mr. Petersen  
Two lectures; one weekly discussion section to be arranged.  
An introduction to the study of social organization. The social aspects of industrialization are examined in terms of social trends and of selected case studies from several countries. Such topics as population trends, urbanization, social aspects of economic conduct and culture contacts are given special attention.

## SOPHOMORE COURSE

30. Society and Personality. (3) I. Mr. Shibutani  
Two lectures: one weekly discussion section to be arranged.  
Consequences of participation in group life: the social organization of perspectives and personality, and the social control of conduct. Recommended preparation for upper division courses in social psychology; also open to general students.

## UPPER DIVISION COURSES

## Group A: Social Theory

- 100A-100B. Theory of Social Process. (3-3) Yr. Mr. Bock  
100A. Traditional perspectives in the study of social and cultural development; the idea of cycles and the idea of progress.  
100B. Objectives and procedures of nineteenth-century studies of social process. Recent approaches and the break with traditional orientations.  
100A is not prerequisite to 100B.
- 101A-101B. Theories of Social Change. (3-3) Yr. Mr. Grana  
101A. Critical analysis of geographical, racial, and economic theories of social progress.  
101B. Comparison of the procedures of investigation employed in studies of social evolution, in natural history, and history.  
101A is not prerequisite to 101B.
109. Sociology and Social Thought. (3) I. Mr. Grana  
(Formerly numbered 109A-109B.)  
History of social thought treated as the source of contemporary problems and hypotheses.
122. French Social Thought. (3) I. Mr. Grana  
From Rousseau to Emile Durkheim; the relation of sociology to problems created by the revolution in France; sociology treated as a manifestation of nineteenth-century Conservatism.
125. Contemporary Issues in Social Theory. (3) I. Mr. Bendix  
The social status of the intellectual and the problem of knowledge and action in social thought are discussed. The treatment of this problem by major social theorists is analyzed, together with related issues in the sociology of intellectual life.
- Theory of Historical Inquiry (Philosophy 147). (3) II. Mr. Strong

**Group B: Methods of Research**

105. Introduction to Methods of Sociological Study. (3) II. \_\_\_\_\_  
 (Formerly numbered 105A.)  
 Examination of methodological problems and technical procedures involved in the selection and definition of problems of investigation; and in the selection, description, classification, and analysis of data. Emphasis on non-quantitative research methods.
106. Introductory Statistics in Sociology. (3) I. Mr. MacRae  
 (Formerly numbered 16.)  
 Two lectures; one three-hour laboratory per week.  
 An introduction to basic procedures of statistical analysis of social data; frequency distributions, measures of central tendency and dispersion, simple correlation techniques, measures of reliability and significance.
113. Survey Methods in Sociology. (3) II. Mr. MacRae  
 Methods of collecting and treating data for quantitative analysis. Use of published and documentary data. Elementary sampling methods, design of schedules and questionnaires, and interviewing in sociological research. Coding; content analysis; handling and interpretation of quantitative information.
114. Advanced Quantitative Methods in Sociology. (3) II. Mr. MacRae  
 Prerequisite: course 106 or equivalent.  
 Analysis of variance and its application to sociological problems. Linear, nonlinear, multiple and partial correlation and regression. Analysis of co-variance. Sampling procedures. Scaling theory for questionnaire and interview material. Introduction to factor analysis; logic of measurement.

**Group C: Social Psychology and Collective Behavior**

- \*104. Group Life and the Social Self. (3) I. Mr. Shibusani  
 (Formerly numbered 104B.)  
 Recommended: course 1 or 30.  
 Coördination in group behavior with special reference to the genesis and functioning of the self. Introduction to the social psychology of G. H. Mead, with elaboration and evaluation in the light of current research.
- \*107. Social Control. (3) I. Mr. Blumer  
 Critical evaluation of divergent approaches to the analysis of social control.
- \*148. Elementary Collective Behavior. (3) I. Mr. Shibusani  
 (Formerly numbered 148A.)  
 Spontaneous, non-institutionalized forms of group behavior; social contagion and crowd behavior, psychic epidemics, popular arts and interests, fashion movements, formation and manipulation of public opinion.
- \*149. Social Movements and Public Action. (3) II. Mr. Kornhauser  
 (Formerly numbered 148B.)  
 Analysis of social movements, the formation and play of public opinion, and the behavior of interest groups.
175. Communication and Social Contact. (3) I. Mr. MacRae  
 (Formerly numbered 104A.)  
 Recommended: course 1 or 30.  
 The establishment of communication channels through differential contact and association; the emergence of consensus in selected primary and secondary groupings. Special emphasis upon the organization and modification of perspectives in mass societies.

\* Not to be given, 1954-1955.

178. Social Interaction and Personal Organization. (3) II. Mr. Blumer  
A critical analysis of social interaction and personality. Dominant theoretical approaches and schemes of research in social psychology will be considered.

**Group D: Comparative Institutions and Historical Processes**

- 131A-131B. Study of Social Processes. (3-3) Yr. Mr. Bock  
Research course in the comparative and historical study of institutional processes. Individual or group projects in the investigation of processes involved especially in conflict or peaceful contact situations between peoples and groups; other projects accepted with consent of instructor. Emphasis on the sociological use of historical materials. Laboratory and discussion sessions, personal conferences, occasional lectures.  
131A not prerequisite to 131B.
134. Sociology of War and Conflict. (3) II. Mr. Bock  
War as a form of social conflict; violent and peaceful procedures in the pursuit of national objectives; analysis of attempts to specify the common antecedents of war.
135. Social Change in Underdeveloped Countries. (3) I. Mr. Eberhard  
The problem of progress; the process of change; analysis of factors influencing social change especially in modern Western and Asiatic society.
- 141A\*-141B. History of Western Social Organization. (3-3) Yr.  
Mr. Grana  
An analysis of the changing position of the family and community in Western society; effects of war, industrialism, and nationalism upon these groups; background of contemporary problems.  
141A not prerequisite to 141B.
142. Comparative Institutions. (3) I. Mr. Eberhard  
(Formerly numbered 142A.)  
Comparative treatment of selected social institutions with special reference to present industrial, modern societies. Relation of ideas to institutions; institutions and social change.
145. Pre-Industrial Societies. (3) II. Mr. Eberhard  
(Formerly numbered 142B.)  
Comparative treatment of social institutions of political character and their transformation. Village, city, state and the problem of stratification.
- \*151A-151B. The History of Civilization. (3-3) Yr. Miss Hodgen  
Nine hours of laboratory per week.  
A study of historical changes in the civilization of selected areas.  
151A not prerequisite to 151B.
166. Oriental Societies. (3) II. Mr. Eberhard  
Main characteristics of Asiatic agricultural societies (China, Japan, India). Differences from western cultures. Research methods. Emphasis on the medieval periods.
- \*167. Nomadic Societies. (3) II. Mr. Eberhard  
Main characteristics of Asiatic nomadic societies (Central Asia, Turks, Mongols, Middle East). Their contacts with non-nomadic cultures.

\* Not to be given, 1954-1955.

- \*168. Culture Contacts and Colonial Policies. (3) I. \_\_\_\_\_  
 Study of the impact of western colonial policies and practices upon the indigenous social structure of non-western countries, with special reference to India and Southeast Asia.

**Group E: Social Structures and Large-Scale Organizations**

102. Social Problems of Large-Scale Organizations. (3) II. Mr. Bendix  
 The growth of large-scale organizations in business and government; social and psychological factors affecting human relations.
111. Analysis of Social Institutions. (3) I. Mr. Selznick  
 Diagnosis of selected institutions—in education, religion, government, the press, recreation, and industry—with emphasis on the social conditions affecting the fulfillment and transformation of key goals and values.
118. Political Sociology. (3) I. Mr. Selznick  
 Introduction to the sociological study of political life. Social and cultural aspects of such topics as political order, voting behavior, nationalism and revolution are discussed.
- \*129. Sociology of Occupations and Professions. (3) II. Mr. Kornhauser  
 An historical and comparative study of selected occupational and professional groups, with emphasis on the social significance of occupational ideologies and the sociological factors related to their development.
132. Social Stratification. (3) II. Mr. Grana  
 Analysis of recent occupational trends and of social problems of occupational stratification; social classes in local communities and the nation as related to interest organizations.

**Group F: Community Life**

110. Inter-Ethnic Contacts. (3) I. Mr. Shibutani  
 Prerequisite: course I, or consent of instructor.  
 Consequences of the contact of peoples: the symbolic significance of identification marks, multi-ethnic status systems, minority groups and movements, inter-ethnic tensions, race ideology and public policy.
115. Major Social Problems. (3) II. Mr. Petersen  
 The bearing of sociological investigation on the diagnosis and treatment of problems arising from social and cultural disorganization. Race relations, crime, old age, industrial conflict, and political disorder will be among the topics discussed.
130. Sociology of the Family. (3) I. Mr. Petersen  
 Interactions among family, society, and personality in western culture from ancient times to the present.
133. Population and Migration. (3) I. Mr. Petersen  
 (Formerly numbered 133A.)  
 Population growth, distribution, and movements in Europe and the United States. Demographic processes in relation to institutional changes, migration, ethnic distribution, and public policies.
138. Population Changes in Underdeveloped Areas. (3) II. Mr. Petersen  
 (Formerly numbered 133B.)  
 Population problems of Latin America, Africa, the Near East, and Asia. Population trends in relation to the impact of western civilization upon the indigenous cultures.

\* Not to be given, 1954-1955.

- \*157. Rural Social Organization. (3) I. \_\_\_\_\_  
 Study of differences in the social organization of agricultural communities in Latin America, the Orient, South Africa, Canada and the United States, with emphasis on the effects of industrialization in these areas.
160. The City. (3) I. Mr. Petersen  
 Social structure of the urban community. Comparative materials from earlier historical periods and from contemporary societies will be used. Emphasis on the effects of urbanization upon various social institutions.
- \*161. Community and Modern Industry. (3) I. \_\_\_\_\_  
 Institutional and ideological setting of industry; effects of size and composition of the community on industry and trade unions; social groupings in the community and the factory.
162. Urban Ecology. (3) II. Mr. Foley  
 An examination of the ecological and demographic structure of cities. The ecological implications of city planning and housing activity. Mainly concerned with the United States, but some non-American comparative material also introduced.
- Rural Sociology (Agricultural Economics 112A-112B). (2-2) Yr.  
 Mr. Taylor
199. Special Study for Advanced Undergraduates. (1-4) I and II.  
 The Staff (Mr. Bock in charge)

## GRADUATE COURSES

- \*200A-200B. Practicum in Sociological Field Research. (2-2) Yr.  
 Mr. Shibusani  
 Prerequisite: consent of instructor. Recommended preparation: courses 105, 106, 119.  
 Conceptualization and problem formulation; hypotheses and study designs; techniques of observation, recording and analysis. Participation in joint field studies on selected problems.
202. Seminar in Social Problems in Large-Scale Organization. (2) II.  
 Mr. Bendix
203. Seminar in Contemporary Social Theory. (2) I. Mr. Bendix
204. Seminar in Social Contacts. (2) I. Mr. Shibusani  
 Types of social contact and the conditions of their establishment and dissolution.
207. Seminar in Social Action. (2) I. Mr. Blumer  
 Analysis of the social direction of human conduct; theories and research.
- 210A-\*210B. Seminar in Comparative Social Processes. (2-2) Yr.  
 Mr. Bock  
 A study of comparable historical events or event series for the purpose of discovering social or cultural processes.  
 210A is not prerequisite to 210B.

\* Not to be given, 1954-1955.

218. Advanced General Sociology. (2) I. Mr. Selznick  
 Analysis of fundamental processes and areas of study in contemporary sociology. Emphasis is placed on a critical examination of basic concepts and premises. A graduate lecture course designed especially for new graduate students.
- \*221A-221B. Seminar in Social and Historical Processes. (2-2) Yr.  
 221A is not prerequisite to 221B. Miss Hodgen
226. The Metropolitan Region. (2) I. Mr. Foley  
 The role and influence of the large city in ordering the social life and spatial patterns of its surrounding territory. The multi-nucleated urban agglomerate. The urban-rural fringe. Social-economic relations among large city, small city, village, and farm.
- \*235. Seminar in Non-European Cultural Stratification. (2) II.  
 (Formerly numbered 235A.) Mr. Eberhard  
 Social processes in Asiatic and North African pre-industrial societies resulting from conquest of agrarian communities by nomads. Problem of feudalism.
236. Social Change in Underdeveloped Countries. (2) II. Mr. Eberhard  
 Study of the process of modernization and industrialization of non-western societies with special reference to colonial and non-colonial areas of Asia.
238. Seminar in Colonization by Non-Western Societies. (2) I.  
 (Formerly numbered 235B.) Mr. Eberhard  
 Study of migratory processes in Asia, especially the Far East, in the medieval and modern period. Chinese, Japanese, and Indian expansion and their influence upon social change in the area of penetration.
- \*241. Seminar in Social Organization. (2) II. Mr. Selznick  
 (Formerly numbered 241A-241B.)  
 The social conditions affecting the structure and functioning of voluntary associations and administrative organizations; the relation of such organizations to community integration.
- 245A-245B. Quantitative Methods in Political Sociology. (2-2) Yr.  
 Mr. MacRae  
 Critical survey of literature and analysis of data. Use of election statistics, legislative roll call votes and sample surveys. Relation of social stratification and urbanism to political representation. 245A is not prerequisite to 245B.
248. Seminar in Collective Behavior. (2) II. Mr. Blumer  
 Studies in mass behavior, social movements, and political action.
- \*260A-260B. Seminar in Political and Industrial Sociology. (2-2) Yr.  
 Mr. Kornhauser  
 Contributions of sociology to theory and research in politics and industrial relations. Analysis of structure and ideology of organized groups.
- Seminar in Theories of History (Philosophy 247). (2) I. Mr. Strong
299. Individual Study and Research. (1-6) I and II.  
 The Staff (Mr. Eberhard in charge)



## SOILS

(Department Office, 108 Hilgard Hall)

<sup>2</sup> Geoffrey B. Bodman, Ph.D., *Professor of Soil Physics (Chairman of the Department of Soils)*.Robert L. Crocker, Sc.D., *Professor of Soil Morphology*.Lannes E. Davis, Ph.D., *Professor of Soils, Davis (Vice-Chairman of the Department)*.Hans Jenny, D.Sc., *Professor of Soil Chemistry and Morphology*.Roy Overstreet, Ph.D., *Professor of Soil Chemistry*.Walter P. Kelley, Ph.D., *Professor of Soil Chemistry, Emeritus*.Paul R. Day, Ph.D., *Associate Professor of Soil Physics*.A. Douglas McLaren, Ph.D., *Associate Professor of Soil Chemistry*.Daniel I. Arnon, Ph.D., *Professor of Plant Physiology*.Isaac Barshad, Ph.D., *Lecturer in Soils*.Homer D. Chapman, Ph.D., *Professor of Soils and Plant Nutrition, Riverside*.Raymond E. Storie, B.S., *Lecturer in Soil Technology*.Perry R. Stout, Ph.D., *Professor of Plant Nutrition*.Albert Ulrich, Ph.D., *Lecturer in Plant Nutrition*.

*Letters and Science List*.—Courses 110, 111, 112, 113, 114 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser*: Mr. Day.

*Preparation for the major*.—See page 86 of the CIRCULAR OF INFORMATION.

## SOIL SCIENCE

No student will be accepted as a major student in soil science who has not attained at least an average grade of C in each of the fields of required courses in chemistry, physics, botany, bacteriology, and the geological sciences.

## LOWER DIVISION COURSES

10. The Soil and Its Significance to Man. (3) II. Mr. Jenny  
Lectures.  
Prerequisite: Chemistry 1A, or high school chemistry.  
Designed for students who desire a general knowledge of soils, soil resources, soil conservation, and the relationship of soil to man and society. Cannot be used for credit in the Soil Science major.
- 10L. The Soil and Its Significance to Man. Laboratory. (1) II. Mr. Jenny  
(Formerly included in course 10.)  
Laboratory, demonstrations and field trips.  
Prerequisite: course 10 (may be taken concurrently)

## UPPER DIVISION COURSES

100. Soil Characteristics. (4) I. Mr. Day  
Lectures, laboratory, and field trips.  
Prerequisite: Chemistry 1A-1B; Physics 2A-2B. Recommended: Geology 1 or 10, or equivalent.  
An introduction to the physical, chemical, and biological properties of the soil.

<sup>2</sup> In residence spring semester only, 1954-1955.

101. Development and Morphology of Soils. (3) II. Mr. Jenny  
Prerequisite: Geology 1; Chemistry 1A-1B. Recommended: course 100.  
Influence of climate, vegetation, parent material, topography, and time on soil development; chemistry of soil formation; classification of soils; relationships between soil groups and agricultural use; developed and illustrated by a critical study of representative soils of the world.
- 101F. Development and Morphology of Soils. (1) II. Mr. Crocker  
Field trips.  
Prerequisite: course 101 should be taken concurrently.  
Excursions on Saturdays to illustrate facts and principles discussed in course 101.
102. Soil Physics. (2) II. Mr. Bodman  
Prerequisite: course 100; calculus (Mathematics 3A-3B, or 16A-16B). Recommended: physical chemistry. Course 102L should be taken concurrently.  
The physical properties of soils and their measurement.
- 102L. Soil Physics. (2) II. Mr. Day  
Laboratory.  
Prerequisite: course 102 (may be taken concurrently).  
Laboratory experiments to accompany course 102.
103. Soils of California. (3) I. Mr. Storie  
Lectures and discussion section. Two field trips during the semester to be arranged.  
Prerequisite: Geology 1; Chemistry 1A-1B.  
The general character, mode of formation, classification, geography, use, and conservation of the soil resources of the State. Practice in identifying, rating, and judging the probable value of the important soils in California for agricultural, grazing, and forest use.
105. Summer Field Course. (6) Mr. Storie  
Six weeks, daily.  
Prerequisite: courses 100, 101 or 103, and consent of instructor.  
Study of soil characteristics, development, and morphology of soils. Soil surveying, including mapping and classifying soils; preparation of soil reports. Practice in identifying and judging the probable value of the dominant soils of the State for agricultural, grazing, and forest use.
110. The Soil as a Medium for Plant Growth. (4) I. Mr. Stout  
Lectures and one other hour to be arranged.  
Prerequisite: Chemistry 1A-1B, 8. Recommended: Geology 1.  
Composition and properties of soils; factors determining productivity; the causes and effects of the soil's reaction, with particular reference to "acid" and "alkali" soils; the nature of fertilizers and some of their effects upon soil and plant; current theory of the soil solution.
111. Soil Microbiology and Soil Biochemistry. (3) II. Mr. McLaren  
Lectures and laboratory.  
Prerequisite: Chemistry 5, 8; Bacteriology 1 or 2.  
The role of microorganisms in nature, particularly in relation to soils.
112. Soil Chemistry in Relation to Plant Growth. (2) II. Mr. Stout, Mr. Overstreet  
Lectures.  
Prerequisite: course 110; Chemistry 5.  
The chemical properties of soils as related to plant growth, and their measurement.

113. Soil Chemistry in Relation to Plant Growth. (2) II.  
 Laboratory. Mr. Overstreet, Mr. Stout  
 Prerequisite: Chemistry 5; course 112 (to be taken concurrently).  
 Soil conditions as phenomena and in relation to factors influencing fertility; liquid and solid phases of the soil, including adsorption phenomena, cation exchange and buffer effects.
114. Properties of Colloidal Particles and Systems. (3) II.  
 Lectures with demonstrations. Mr. Jenny, Mr. McLaren  
 Prerequisite: a course in physical chemistry.  
 Properties of colloidal systems of importance in agriculture and biology. Chemistry and physics of surfaces (adsorption, ion interchange), electric double layer, flocculation, Brownian movement, colloid optics, viscosity, swelling.
116. Soil Management. (2) I. Mr. Day in charge  
 Lectures.  
 Prerequisite: senior standing in soil science.  
 Evaluation of soil fertility by field experiments; use of fertilizers; cultivation practices; aspects of soil erosion control. Lectures, discussions, and demonstrations by various specialists.
199. Special Study for Advanced Undergraduates. (1-5) I and II.  
 Mr. Arnon, Mr. Barshad, Mr. Bodman, Mr. Crocker, Mr. Davis, Mr. Day, Mr. Jenny, Mr. McLaren, Mr. Overstreet, Mr. Storie, Mr. Stout  
 Open only to students with an average grade of at least B, and subject to the approval of the undergraduate adviser in soil science.

## RELATED COURSES IN OTHER DEPARTMENTS

- The Nutrition of Green Plants. (See Plant Nutrition 115, p. 293.)  
 The Nutrition of Green Plants. Laboratory. (See Plant Nutrition 117, p. 293.)  
 Plant Biochemistry. (See Plant Biochemistry 123, 222, p. 46.)

## GRADUATE COURSES

- 201A-201B. Research in Soil Science. (1-9; 1-9) Yr.  
 Mr. Arnon, Mr. Barshad, Mr. Bodman, Mr. Crocker, Mr. Davis, Mr. Day, Mr. Jenny, Mr. McLaren, Mr. Overstreet, Mr. Stout
- \*212. Advanced Soil Chemistry. (3) I. Mr. Overstreet  
 Prerequisite: courses 110, 114; Chemistry 110A-110B, or Chemistry 109 and consent of instructor. Open to graduates and qualified seniors.  
 Applications of thermodynamics to soil systems. Theoretical treatment of ion exchange and membrane phenomena.
235. Seminar. (1) I. Mr. Jenny  
 Prerequisite: graduate standing in soil science, plant physiology, or related subjects.
- 236A-236B. Staff Seminar in Soil Science. (No credit) Yr. The Staff
- (GIVEN AT RIVERSIDE)
- 202A-202B. Research in Soils. (1-6; 1-6) Yr. Mr. Chapman
- 237A-237B. Seminar in Soils. (1-1) Yr.  
 The Staff (Mr. Chapman in Charge)

\* Not to be given, 1954-1955.

## SPANISH AND PORTUGUESE

(Department Office, 4314 Dwinelle Hall)

Charles E. Kany, Ph.D., *Professor of Spanish.*

Yakov Malkiel, Ph.D., *Professor of Romance Philology.*

<sup>a</sup> José F. Montesinos, Licenciado en Filosofía y Letras, *Professor of Spanish.*

Edwin S. Morby, Ph.D., *Professor of Spanish.*

Lesley B. Simpson, Ph.D., *Professor of Spanish.*

Robert K. Spaulding, Ph.D., *Professor of Spanish (Chairman of the Department).*

Arturo Torres-Rioseco, Ph.D., *Professor of Latin-American Literature.*

Erasmus Buceta, Doctor en Derecho, *Professor of Spanish, Emeritus.*

S. Griswold Morley, Ph.D., Litt.D., *Professor of Spanish, Emeritus.*

Fernando R. Alegria, Ph.D., *Assistant Professor of Spanish.*

<sup>1</sup> G. Arnold Chapman, Ph.D., *Assistant Professor of Spanish.*

\* Dorothy C. Shadi, Ph.D., *Assistant Professor of Spanish.*

Edwin J. Webber, Ph.D., *Assistant Professor of Spanish.*

Benjamin M. Woodbridge, Jr., Ph.D., *Assistant Professor of Portuguese.*

Marian Fredine, M.A., *Associate in Spanish.*

Madre Merrill, M.A., *Associate in Spanish.*



Marshall R. Nason, M.A., *Visiting Assistant Professor for the spring semester.*

*Letters and Science List.*—All undergraduate courses are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers.*—For Plan A, Mr. Webber; for Plan B, Mr. Torres-Rioseco.

*Preparation for the Majors.*—Majors in Plan A and Plan B (described below) have a common preparation, namely: four years of high school Spanish, or courses 1, 2, and 3 (if course 3 is passed with a grade of at least B; otherwise include course 4); course 25A–25B or 25; two years of high school Latin, or Latin 1 or Latin 1A–1B (to be completed before entering upon the senior year).

Students transferring from other institutions with advanced standing and intending to major in the department must present evidence (by examination or otherwise) that their preparation includes the equivalent of Spanish 25A–25B or 25.

*The Majors.*—Two majors are offered in the department: Plan A, The Literature and Language of Spain; Plan B, The Literature and Language of Latin America.

Requirements for Plan A: 24 units of upper division work in the department, including courses 107A–107B (6 units) and 112A–112B (4 units). The remaining units may be completed from courses 100, 103A–103B, 105, 109A–109B, 110A–110B, 111A–111B, 115, 116A–116B. Recommended electives: further study in French, Italian, Portuguese, and Latin, and History 160A–160B.

Requirements for Plan B: 24 units of upper division work in the department, including courses 104A–104B (6 units), 107A–107B (6 units), 113A–113B (4 units), 114A–114B (4 units). The remaining units may be com-

<sup>1</sup> In residence fall semester only, 1954–1955.

<sup>2</sup> In residence spring semester only, 1954–1955.

\* Absent on leave, 1954–1955.

pleted from Portuguese 123, Spanish 102, 105, 110A-110B, 111A-111B, 112A-112B, 115, 116A-116B. Recommended electives: Spanish 103A-103B; History 161A-161B; French 112A-112B, French 121A-121B.

Students who fail to maintain at least an average grade of C in the Spanish courses taken in the upper division will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major.

*Honor Students in the Upper Division.*—Candidates for honors must do distinguished work (B average or better) in their major programs.

*Higher Degree.*—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

### SPANISH

#### LOWER DIVISION COURSES

Students whose native tongue is Spanish or Portuguese will not normally be admitted into any lower division courses in their respective language except that prospective major students may be admitted to Spanish 25A-25B or 25, or Portuguese 25A-25B.

1. Elementary Spanish. (4) I and II. Miss Fredine in charge  
Sections meet five hours per week.
  2. Elementary Spanish (continuation of 1). (4) I and II. Miss Merrill in charge  
Sections meet five hours per week.  
Prerequisite: course 1 or two years of high school Spanish, or equivalent.
  3. Intermediate Spanish (continuation of 2). (4) I and II. Miss Fredine in charge  
Sections meet five hours per week.  
Prerequisite: course 2 or three years of high school Spanish, or equivalent.
  4. Introduction to Spanish Literature. (4) I and II. Mr. Alegría, Miss Fredine  
Sections meet four hours per week.  
Prerequisite: course 3 or four years of high school Spanish, or equivalent.  
Reading and translation.
- 25A-25B. Advanced Spanish. (3-3) Yr. Beginning each semester.  
Mr. Malkiel, Mr. Morby, Mr. Simpson, Mr. Chapman  
Required as preparation for the major.  
Prerequisite: four years of high school Spanish, or course 3 (with a grade of at least B) or 4, or equivalent.
25. Advanced Spanish. (5) II. Mr. Webber  
Prerequisite: same as for 25A.  
Alternative course to 25A-25B, designed for students entering in mid-year who wish to prepare themselves for entering the upper division the following fall.
  39. Spanish and Spanish-American Literature in English Translation. (2)  
Open to students in all departments of the University. No knowledge of Spanish necessary
    - 39A. Spain: Medieval Period, Renaissance, and Golden Age. (2) I. Mr. Webber
    - 39B. Spain: Neo-Classical Period to Present Day. (2) II. Mr. Webber
    - 39C. Spanish America: To the End of the Nineteenth Century. (2) I. Mr. Chapman
    - 39D. Spanish America: Modernism and the Contemporary Period. (2) II. Mr. Alegría, Mr. Nason

## UPPER DIVISION COURSES

100. Introduction to Spanish Linguistics. (2) I. Mr. Kany
102. American-Spanish Divergencies from Standard Castilian. (2) II.  
Mr. Kany
- 103A. History of Spanish Literature (1680-1900). (3) I. Mr. Simpson
- 103B. Study of a Prose Genre of the Nineteenth Century. (3) II.  
Mr. Montesinos
- 104A-104B. Spanish-American Literature. (3-3) Yr. Beginning each semester. Required of majors in Plan B.  
Mr. Alegria, Mr. Chapman, Mr. Nason, Mr. Torres-Rioseco
105. Modern Peninsular Drama: From the Romantic Movement to the Present. (3) I. Mr. Webber
- 107A-107B. History of Spanish Literature to 1680. (3-3) Yr.  
Prerequisite: senior standing. Mr. Spaulding, Mr. Morby  
Required of majors in Plan A and Plan B.
- \*109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries. (2-2) Yr. Mr. Montesinos
- 110A\*-110B. Twentieth-Century Peninsular Prose. (2-2) Yr. ———
- 111A-111B. Cervantes. (3-3) Yr. Mr. Simpson
- 112A-112B. A Survey of Spanish Culture. (2-2) Yr.  
112A: Mr. Malkiel. Mr. Malkiel, Mr. Montesinos  
112B: Mr. Montesinos.  
Required of majors in Plan A.
- 113A-113B. A Survey of Latin-American Culture. (2-2) Yr.  
Required of majors in Plan B. Mr. Torres-Rioseco
- 114A-114B. The Contemporary Spanish-American Novel. (2-2) Yr.  
Prerequisite: course 104A-104B. Mr. Alegria  
Required of majors in Plan B.
115. A Survey of Spanish Lyric Poetry. (3) II. ———
- 116A-116B. Advanced Grammar and Composition. (3-3) Yr. Mr. Kany  
Required of candidates for the Certificate of Completion, teacher-training curriculum, whose major is Spanish, and recommended for those whose minor is Spanish.
125. Spanish Pronunciation. (2) I and II. Mr. Kany  
(Formerly numbered 225.)
131. A History of the Spanish Lexicon. (2) II. Mr. Malkiel  
A brief introductory survey of the lexical strata against the background of Hispanic culture history.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
Mr. Morby in charge  
Restricted to senior honor students, by previous arrangement with members of the departmental staff.

\* Not to be given, 1954-1955.

## GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

In the requirements for the master's degree this department follows Plan II.

- 200A-200B. Early Spanish Literature. (2-2) Yr. Mr. Webber  
 200A: To the Fifteenth Century.  
 200B: The Fifteenth Century.  
 Analytical history of Spanish literature to the Renaissance: the development of the various genres; the provincial literatures; a thorough grounding in bibliography; the development of a critical attitude.
- \*201A-201B. History of the Spanish Lyric. (2-2) Yr. \_\_\_\_\_
- \*202A-202B. History of the Spanish Novel to the End of the Seventeenth Century. (2-2) Yr. \_\_\_\_\_
- 204A-204B. The Spanish American Novel. (2-2) Yr. Mr. Alegría
- \*206A. Problems in American Spanish. Syntax. (2) II. Mr. Kany
- \*206B. Problems in American Spanish. Semantics. (2) II. Mr. Kany
- \*208A-208B. The Ballad. (2-2) Yr. \_\_\_\_\_
- 209A-209B. The Drama of the Golden Age. (2-2) Yr. Mr. Morby  
 An intensive study of one author.
- 212A-212B. Old Spanish. (2-2) Yr. Mr. Spaulding  
 Reading and historical grammar. Required for candidates for the master's degree.
- \*213A-213B. The Spanish Novel in the Nineteenth Century. (2-2) Yr. Mr. Montesinos
- \*214A-214B. Modernism in Hispano-America. (2-2) Yr. Mr. Torres-Rioseco
- \*215A-215B. Moralists and Satirists of the Sixteenth and Seventeenth Centuries. (2-2) Yr. Mr. Montesinos
- \*216. Spanish Versification. (1) II. Mrs. Shadi
- \*217A-217B. Contemporary Poetry of Spain. (2-2) Yr. Mr. Montesinos
- \*218A-218B. Seminar in Spanish Diplomatic Paleography of the Sixteenth Century. (2-2) Yr. Mr. Simpson
- 219A\*-219B. Spanish Literary Criticism from Neo-Classicism to Modern Times. (2-2) Yr. Mr. Montesinos
- \*224A-224B. Gaucho Literature. (2-2) Yr. Mr. Torres-Rioseco  
 Prerequisite: course 104A-104B.  
 This course deals with that national type of Argentinian literature known as the "gauchesco" genre. The course is centered around the epic poem, *Martin Fierro*, but includes the origins of this movement as well as its modern development.
299. Special Advanced Study. (1-4) I and II. Mr. Morby in charge  
 Restricted to candidates for higher degrees, by previous arrangement with members of the departmental staff.

\* Not to be given, 1954-1955.

## PORTUGUESE

## LOWER DIVISION COURSES

1. Elementary Portuguese. (4) I. Mr. Woodbridge  
Sections meet five hours per week.
2. Elementary Portuguese. (4) II. Mr. Woodbridge  
Prerequisite: course 1 or oral command of the language.  
Sections meet five hours per week.
- 21A-\*21B. Readings in Portuguese. (3-3) Yr. Mr. Woodbridge  
For advanced students in Romance Languages who have no previous preparation in Portuguese but wish to acquire a reading knowledge. Also open to students completing course 1 with a grade of A or B or course 2, or the equivalent.  
Reading and translation.
- 25A-\*25B. Advanced Reading, Composition and Conversation. (3-3) Yr. Mr. Woodbridge  
Prerequisite: course 2 or 21 or equivalent, or consent of instructor.  
25A to be given in the spring semester, 1955.

## UPPER DIVISION COURSES

Portuguese 122 and 123 are open to upper division and graduate students in Romance languages with no previous knowledge of Portuguese.

122. Portuguese Literature. (3) I. Mr. Woodbridge  
Survey of the literature of Portugal.
123. Brazilian Literature. (3) II. Mr. Woodbridge  
Survey of the literature of Brazil.
199. Special Study for Advanced Undergraduates. (1-3) I and II.  
Restricted to senior honor students. Mr. Malkiel, Mr. Woodbridge

## GRADUATE COURSES

- \*201. The Brazilian Novel. (2) II. Mr. Woodbridge
299. Special Advanced Study. (1-4) I and II.  
Mr. Malkiel, Mr. Woodbridge  
Restricted to candidates for higher degrees.

## RELATED COURSE IN ANOTHER DEPARTMENT

Comparative Literature 202A-202B. The French Heritage in Spanish-American Literature. (2-2) Yr. Mr. Torres-Rioseco

## SPEECH

(Department Office, 3125 Dwinelle Hall)

- C. Douglas Chrétien, Ph.D., *Professor of Speech and Linguistics.*  
Gerald E. Marsh, M.A., *Professor of Speech (Chairman of the Department).*  
David Rynin, Ph.D., *Professor of Speech.*  
Jacobus ten Broek, J.S.D., *Professor of Speech.*  
Edward Z. Rowell, Ph.D., *Associate Professor of Speech, Emeritus.*  
Dwight E. Watkins, M.A., *Associate Professor of Speech, Emeritus.*

\* Not to be given, 1954-1955.



- Edward N. Barnhart, Ph.D., *Associate Professor of Speech and Lecturer in Psychology.*
- Woodrow W. Borah, Ph.D., *Associate Professor of Speech.*
- \* Isabel Hungerland, Ph.D., *Associate Professor of Speech.*
- \* Arnold Perstein, Ph.M., *Associate Professor of Speech.*
- † Garff B. Wilson, Ph.D., *Associate Professor of Speech.*
- Robert L. Beloof, Ph.D., *Assistant Professor of Speech.*
- William Fearnside, LL.B., Ph.D., *Assistant Professor of Speech.*
- Don Geiger, Ph.D., *Assistant Professor of Speech.*
- Richard Hagopian, M.F.A., *Assistant Professor of Speech.*
- \* William B. Holther, Ph.D., *Assistant Professor of Speech.*
- Anthony Ostroff, M.A., *Assistant Professor of Speech.*
- William Shepard, Ph.D., *Assistant Professor of Speech.*
- Richard B. Wilson, Ph.D., *Assistant Professor of Speech.*
- Michael Karnis, Ph.D., *Instructor in Speech.*
- Elizabeth Russell, Ph.D., *Associate in Speech.*
- Fred Stripp, M.A., Th.D., *Associate in Speech.*
- Ward E. Tabler, A.B., *Associate in Speech.*



- Margaret Blackburn, M.A., *Lecturer in Speech.*
- Rebecca Hayden, M.A., *Lecturer in Speech.*
- Robert Horan, *Lecturer in Speech.*
- Floyd Matson, M.A., *Lecturer in Speech.*
- Warren Mullins, M.A., *Lecturer in Speech.*
- Dorothy Pilgrim, M.A., *Lecturer in Speech.*
- Kenneth Scholes, M.A., *Lecturer in Speech.*
- Angela Sullivan, M.A., *Lecturer in Speech.*
- Kathleen Sullivan, M.A., *Lecturer in Speech.*

Students must have passed Subject A before taking any course in speech.

The courses in speech fall into two well-defined groups:

(a) *Oral Expression.* In this group come such courses as those in voice culture and oral interpretation of literature.

(b) *Logical Discourse—Expository and Argumentative.* Under this heading are grouped the courses covering the logical and rhetorical bases of those forms of discourse that are primarily addressed to the intellect. The field covered includes study of methods of investigation, analysis, briefing, the testing of evidence, and practice in oral presentation.

Generally speaking, students may choose courses in either group, or in both, but those students who elect speech for their major study are required to arrange their courses so as to cover the fundamentals in both phases of the work before taking advanced studies in their special fields. It is hoped that by a combination of both kinds of work a foundation may be laid which will prove valuable not only to teachers of oral English in the high school but also to all those who are preparing for professional careers in which the clear and orderly presentation of thought, orally, plays an important part.

*Letters and Science List.*—All undergraduate courses in speech are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Adviser:* Mr. Tabler.

*Preparation for the Major.*—Students who wish to make speech their major

\* In residence spring semester only, 1954–1955.

\* Absent on leave, 1954–1955.

† Sabbatical leave in residence, fall semester, 1954–1955.

subject must have completed, with an average grade of C or better, courses 1A-1B and 2A-2B. It is recommended that Philosophy 6A-6B be taken concurrently with course 1A-1B.

*The Major*.—Required: 24 units in upper division courses which must include 107A-107B, 110A-110B, and 111A-111B. Course 107A-107B should be taken in the junior year. The following courses are also recommended: English: 114A-114B, 116, 117E, and 110; Philosophy: 104, 108, 112, 125, 128, 136A-136B, and 146.

*Honors*.—Candidates for honors at graduation must have completed the major with an average grade not lower than B.

#### LOWER DIVISION COURSES

1A-1B. Elements of Speech. (3-3) Yr. Beginning each semester.

Mr. Barnhart, Mr. Borah, Mr. Chrétien, Mr. Fearnside,  
Mr. Geiger, Mr. Marsh, Mr. Matson, Mr. Mullins,  
Mr. Perstein, Mr. Rynin, Mr. Shepard, Mr. Stripp,  
Mr. Tabler, Mr. ten Broek, Mr. R. B. Wilson

A forum of organized student discussion and speeches based on an intensive study of selected essays chosen from the writings of representative English and American authors; training in the principles of oral rhetoric, in summarizing and outlining, in the use of the library, and in the presentation from the platform of prepared speeches.

In each semester Mr. ten Broek's sections of 1A and 1B are primarily for prelegal students.

2A-2B. The Fundamentals of Oral Interpretation of Literature. (3-3) Yr. Beginning each semester.

Mr. Beloof, Miss Blackburn, Mr. Hagopian, Miss Hayden, Mr.  
Horan, Mrs. Hungerland, Mr. Ostroff, Mr. Scholes, Mrs.  
A. Sullivan, Miss K. Sullivan, Mr. G. B. Wilson

Introduction to the oral reading of prose and poetry; practice in speaking and reading with training in the principles for effective delivery.

10A. The Logic and Semantics of Argument. (3) I and II. Mr. Rynin

An introduction to the theory of argument with emphasis on the problems of meaning, influence, and evidence.

†10B. The Logic and Semantics of Argument. (3) II. Mr. Rynin

Application of the principles developed in course 10A to the construction and criticism of arguments, especially those concerned with the rational discussion of social issues.

12. Psychology of Argument. (3) II. Mr. Barnhart

Primarily concerned with the function of communication in inducing belief and directing behavior; an introductory study of techniques used in political propaganda and other forms of persuasion.

24. Oral English for Foreign Students. (Intensive course). (8) I and II.

Miss Hayden, Mrs. Pilgrim

Pronunciation, speaking, grammar, reading, and writing of English. Required for those who pass the Examination in English with a mark of 3 or lower.

26. Oral English for Foreign Students. (4) I and II.

Mr. Karnis, Mrs. Pilgrim

Required of those who pass the English Examination for Foreign Students with a mark of 2.

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

## 40. Advanced Oral English for Foreign Students. (3) I and II.

Mrs. Russell, Mr. Tabler

Prerequisite: course 26 or consent of instructor.

Practice in précis writing of advanced material, designed to improve the student's ability to grasp and restate meaning of material and to plan and present formal speeches.

## UPPER DIVISION COURSES

## 103. General Phonetics. (3) II.

Mr. Chrétien

Physical, anatomical, and physiological background of speech. Classical articulatory phonetic theory. Modern acoustic phonetics.

## 106. The Oral Reading of Poetry and Prose. (3) I and II.

Mr. Ostroff

Prerequisite: primarily for candidates for teaching credentials whose major is English; others admitted with consent of instructor. Not open to students who have taken course 2A or 2B.

The study of poetry and prose from the point of view of oral interpretation. The principles of effective oral reading of literature; much practice in platform reading.

## 107A-107B. Argumentative Discourse: Oral and Written. (3-3) Yr. Beginning each semester.

Mr. Borah, Mr. Fearnside, Mr. Geiger, Mr. Shepard

Prerequisite: course 1A-1B.

Students completing this course may not receive more than 2 units of credit for course 152.

## 110A-110B. Oral Argumentation and Debate. (3-3) Yr.

Mr. Marsh, Mr. Perstein, Mr. Shepard

Prerequisite: courses 1A-1B, 2A-2B, and 107A-107B.

## 111A-111B. The Reading of Prose and Poetry. (3-3) Yr. Beginning each semester.

Mr. Belooof, Miss Blackburn, Mr. Hagopian, Mr. Horan, Mrs. Hungerland, Mr. Ostroff, Mr. Scholes, Mr. G. B. Wilson

Prerequisite: course 2A-2B.

111A: The essay and the short story.

111B: The ballad, the lyric, the ode, etc.

## 117A-117B. Semantics. (3-3) Yr.

Mr. Rynin

Prerequisite: junior standing.

An examination of the nature and functions of language with special emphasis on the problems of meaning.

117A: The language of cognition: designative meaning.

117B: The language of action: non-designative meaning.

## 118. Symbolism: A Study of the Expressive Functioning of Signs. (3) II.

Prerequisite: course 12 or consent of instructor. Mrs. Hungerland

The nature of symbols, with special emphasis on their function in poetry.

## 119. Analysis of Communication Content. (3) I.

Mr. Barnhart

Introduction to research techniques in communication with special emphasis on content analysis and audience response; individual and group research projects will be carried out by students under supervision.

## \*132. Classical Rhetoric. (3) I.

A study of rhetoric based on the writings of Plato, Aristotle, and other writers, with reference to criticism, aesthetic theory, and speech in the Classical era.

\* Not to be given, 1954-1955.

133. Modern Rhetoric. (3) II. Mr. Geiger  
Contemporary rhetorical theory, with special emphasis on its applications to oral reading. Emphasis on modern views of symbolic action. Specific analysis of selected literature.
- \*135. British Public Address During the Eighteenth and Nineteenth Centuries. (3) I. Mr. Shepard  
Critical analysis of speeches of Burke, Pitt, Peel, Cobden, Bright, Gladstone, Disraeli, Newman, Huxley, Mill, and others. Attention given to issues with which they were identified and their relationship to the social movements of their time.
137. American Public Address During the Eighteenth and Nineteenth Centuries. (3) I. Mr. ten Broek  
Critical analysis of speeches of Randolph, Williams, Franklin, Washington, Hamilton, Marshall, Calhoun, Webster, Emerson, Lincoln, Douglas, and others.
138. Modern Public Address. (3) II. Mr. ten Broek  
Critical analysis of speeches of Wilson, Roosevelt, Churchill, and other leaders from 1914 to the present time.
139. Modern Spokesmen. (3) I. Mr. R. B. Wilson  
An examination of the writings and speeches of leading spokesmen for major contemporary movements—political, social, and religious—with special reference to problems of ideology and ideological conflict, objectivity and evaluation, and the rationalization of conflict.
152. Debate. (2) I and II. Mr. R. B. Wilson  
Designed for those who wish to participate in intercollegiate debate. May be repeated for a maximum of 6 units. Students wishing to take this course and 107A–107B may enroll in the latter only with the consent of the instructor and may not receive more than 8 units of credit in any combination of the two courses.
198. Directed Group Studies for Upper Division Students. (1–5) I and II. The Staff (Mr. Marsh in charge)
199. Special Study for Advanced Undergraduates. (1–5) I and II. The Staff (Mr. Marsh in charge)

## SUBJECT A: ENGLISH COMPOSITION

(Subject A Office, 210 California Hall)

### *Committee in charge:*

Bertrand Evans, Ph.D., *Associate Professor of English and Education*  
(*Chairman of the Committee*).

Karl Aschenbrenner, Ph.D., *Associate Professor of Philosophy*.

Philip F. Griffin, M.A., *Associate Professor of Journalism*.



Phil S. Grant, M.A., *Supervisor of Instruction in Subject A*.

Subject A. (No credit) I and II.

Mr. Grant and Assistants

Three hours weekly.

Required of all students who do not pass the examination in Subject A. Fee, \$20. To those students who maintain an average grade of A during

\* Not to be given, 1954–1955.

the first seven weeks of the semester half of the fee will be refunded, and they may discontinue attending the course. For the regulations governing this requirement, see the CIRCULAR OF INFORMATION.

Training in correct writing, including drill in sentence and paragraph construction, diction, punctuation, grammar, and spelling. Weekly compositions and written tests on the text. The principles of English composition are presented, and typical student compositions are analyzed and discussed in sections limited to thirty students.

## VEGETABLE CROPS

(Dean's Office, Agriculture, 133 Giannini Hall)

James E. Knott, Ph.D., Sc.D. (hon.c.), *Professor of Vegetable Crops, Davis (Chairman of the Department)*.

John H. MacGillivray, Ph.D., *Professor of Vegetable Crops, Davis.*

### LOWER DIVISION COURSE

#### 1. Vegetable Production. (3) II.

Mr. MacGillivray

Principles involved in vegetable production; survey of the vegetable industry. Given in the spring semester of odd-numbered years.

## ZOÖLOGY

(Department Office, 4079 Life Sciences Building)

Kenneth B. DeOme, Ph.D., *Professor of Zoölogy and Director of the Cancer Research Genetics Laboratory.*

Richard M. Eakin, Ph.D., *Professor of Zoölogy (Chairman of the Department).*

Daniel Mazia, Ph.D., *Professor of Zoölogy.*

Alden H. Miller, Ph.D., *Professor of Zoölogy and Director of the California Museum of Vertebrate Zoölogy.*

Paul R. Needham, Ph.D., *Professor of Zoölogy.*

Curt Stern, Ph.D., *Professor of Zoölogy.*

Richard Goldschmidt, Ph.D., M.D., Sc.D., *Professor of Zoölogy, Emeritus.*

Samuel J. Holmes, Ph.D., LL.D., *Professor of Zoölogy, Emeritus.*

William Balamuth, Ph.D., *Associate Professor of Zoölogy.*

Seth B. Benson, Ph.D., *Associate Professor of Zoölogy and Curator of Mammals, California Museum of Vertebrate Zoölogy.*

William E. Berg, Ph.D., *Associate Professor of Zoölogy.*

Jonas E. Gullberg, A.B., *Associate Professor of Metrology.*

Morgan Harris, Ph.D., *Associate Professor of Zoölogy (Vice-Chairman of the Department).*

A. Starker Leopold, Ph.D., *Associate Professor of Zoölogy and Conservationist, California Museum of Vertebrate Zoölogy.*

Frank A. Pitelka, Ph.D., *Associate Professor of Zoölogy and Curator of Birds, California Museum of Vertebrate Zoölogy.*

<sup>2</sup> Ralph I. Smith, Ph.D., *Associate Professor of Zoölogy.*

Robert C. Stebbins, Ph.D., *Associate Professor of Zoölogy and Curator in Herpetology, California Museum of Vertebrate Zoölogy.*

Max Alfert, Ph.D., *Assistant Professor of Zoölogy.*

Howard A. Bern, Ph.D., *Assistant Professor of Zoölogy.*

<sup>2</sup> In residence spring semester only, 1954-1955

Robert B. Clark, B.S., *Acting Assistant Professor of Zoölogy.*

Cadet H. Hand, Ph.D., *Assistant Professor of Zoölogy.*

Oliver P. Pearson, Ph.D., *Assistant Professor of Zoölogy and Assistant Curator of Mammals, California Museum of Vertebrate Zoölogy.*

G. Franklin Gwilliam, Jr., A.B., *Associate in Zoölogy.*

William Thurmond, M.A., *Associate in Zoölogy for the fall semester.*



Frances M. Weesner, M.A., *Lecturer in Zoölogy.*

*Letters and Science List.*—All undergraduate courses in Zoölogy except courses 116, 119A–119B, 120A–120B, and 145 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

*Departmental Major Advisers:* Mr. Bern, Mr. Hand.

*Preparation for the Major.*—Required: courses 1A, 1B, Botany 1, Chemistry 1A and 8, Physics 2A–2B, 3A–3B. Recommended: German, French, Chemistry 1B, and elementary courses in other biological sciences.

*The Major.*—Required: (1) 24 units of upper division courses in Zoölogy. For 6 of these units substitutions may be made, with the approval of the undergraduate adviser, from upper division courses in anatomy, bacteriology, biochemistry, botany, entomology, genetics, organic chemistry, paleontology, parasitology, physical chemistry, physics, and physiology. (2) The following courses: (a) 100 or 106, (b) 101, (c) 112 or 113, (d) 114 or 115, (e) two additional upper division courses or course sequences *with laboratory* from within the department or in the related fields listed above. (3) A grade-point average of at least 1.5 and grades of C or higher in upper division courses included in the major. (4) Seniors with a B average or better in Zoölogy are encouraged to avail themselves of the opportunity of course 199 work.

#### LOWER DIVISION COURSES

- 1A. General Zoölogy. (4) I and II. Mr. Harris, Mr. Alfert, Mr. Gwilliam  
I: Mr. Harris, Mr. Gwilliam; II: Mr. Alfert, Mr. Gwilliam.  
Lectures and laboratory.  
Prerequisite: Chemistry 1A.  
An introduction to the principles of biology with special reference to structure, physiology, heredity, and evolution of animals.
- 1B. General Zoölogy. (4) II. Mr. Bern  
Lectures and laboratory.  
Prerequisite: course 1A.  
An introduction to vertebrate zoölogy. Structure, function, development, and history of the vertebrate body.
4. Microscopic Technique. (2) I and II. Miss Weesner  
Laboratory and reading.  
Prerequisite: course 1A and elementary chemistry.  
The preparation of animal tissues for microscopic study; methods of fixing, sectioning, and staining.
10. General Biology. (3) I and II. Mr. Hand, Mr. Smith  
I: Mr. Hand; II: Mr. Smith.  
Lectures and demonstrations.  
An outline of the main facts and principles of biology with special reference to the bearing of biology upon human life. Open without prerequisite to all students, but designed for those not specializing in zoölogy. Not open for credit to students who have had course 1A, but students who have taken course 10 may elect course 1A for credit.

## UPPER DIVISION COURSES

100. Vertebrate Embryology. (4) I. Mr. Eakin, Mr. Thurmond  
Lectures and laboratory.  
Prerequisite: course 1B.  
Details of development of the vertebrate body with emphasis in lectures on human embryology, and in laboratory on that of the chick and pig.
101. Introduction to Physicochemical Biology. (2) I. Mr. Mazia  
Prerequisite: course 1A and 4 additional units in biological sciences, organic chemistry, general physics.  
Survey of the physical and chemical mechanisms underlying the structure and function of the living cell.
- 101C. Physicochemical Biology Laboratory. (2) I. Mr. Mazia  
Prerequisite: course 101 (may be taken concurrently).
102. Introduction to Physicochemical Biology. (2) II. Mr. Mazia  
Continuation of course 101. The performance of work by the cell. Interactions of cell and environment.
- \*102C. Physicochemical Biology Laboratory. (2) II. Mr. Mazia  
Prerequisite: courses 101, 101C, and 102 (may be taken concurrently).
103. Chemical Embryology. (2) I. Mr. Berg  
Prerequisite: course 100.  
A review of the biochemical and physiological studies of developmental processes such as gametogenesis, fertilization, cleavage, and differentiation, with emphasis on results obtained with sea-urchin and amphibian embryos.
105. Growth and Form. (2) II. Mr. Harris  
Prerequisite: course 1B.  
The mechanics and regulation of body growth; repair, ageing, and abnormal growth of adult tissues as studied in regeneration, transplantation, and tissue culture.
106. Comparative Anatomy of the Vertebrates. (4) II. Mr. Harris, ———  
Lectures and laboratory.  
Prerequisite: course 1B. Recommended: course 100.  
Evolution of organ systems and phylogeny of the major vertebrate groups.
107. Cytology. (2) I. Mr. Alfert  
Prerequisite: elementary zoölogy or botany.  
The structure and activities of the cell, especially in development, in sex determination, and in heredity.
- 107C. Cytology Laboratory. (2) I. Mr. Alfert  
Prerequisite: courses 4 and 107 (may be taken concurrently).
110. Biology of the Protozoa. (4) I. Mr. Balamuth  
Lectures and laboratory.  
Prerequisite: course 1A and upper division standing. Recommended: courses 101, 119A.  
Treatment of protozoa in relation to comparative aspects of morphology, physiology and natural habitats. Emphasis in the laboratory upon experimental treatment of living forms, including techniques of cultivation and staining.

\* Not to be given, 1954-1955.

111. General Animal Parasitology. (4) II. Mr. Balamuth  
Lectures and laboratory.  
Prerequisite: course 1A and upper division standing. Recommended: course 119A.  
An introduction to general principles of parasitology, based upon studies of protozoa, helminths and other invertebrates, excepting higher arthropods. Emphasis in the laboratory upon morphology, life histories and host-parasite interactions, including techniques of host examination and staining.
112. Invertebrate Zoölogy. (4) II. Mr. Hand  
Lectures, laboratory, and field work.  
Prerequisite: course 1A.  
Anatomy, classification, and natural history of common invertebrate animals.
113. Natural History of the Vertebrates. (4) II. Mr. Miller, Mr. Benson, Mr. Stebbins  
Lectures, field trips, and laboratory.  
Prerequisite: course 1B.  
The birds, mammals, reptiles, and amphibians, chiefly of California; identification of species; observational methods in study of behavior and habitat relations; systematics. Field work emphasized.
114. Genetics. (3) I. Mr. Stern  
Prerequisite: course 1A, or Botany 1A, or course 10, and upper division standing. Not open for credit to students who take Genetics 100.  
The facts of heredity, basic and advanced.
- 114C. Genetics Laboratory. (2) I. Mr. Stern  
Prerequisite: course 114 (may be taken concurrently).  
Limited to twenty-four students.
115. Human Genetics. (3) II. Mr. Stern  
Prerequisite: course 1A, or Botany 1A, or course 10, and upper division standing.  
A study of the principles of inheritance as applied to the physical and mental characteristics of man, of the heredity-environment problem, and of the genetic constitutions of populations.
116. Introduction to Wildlife and Fisheries Management. (4) I. Mr. Leopold, Mr. Needham  
Lectures and laboratory.  
Prerequisite: course 1A or 10 and upper division standing.  
Theory and practice of wildlife and fisheries management; identification, distribution, and life histories of important species.
118. Comparative Endocrinology. (3) I. Mr. Bern  
Prerequisite: course 1B and Chemistry 8.  
Lectures on the biology of hormonal mechanisms, with reference to the invertebrates and lower vertebrates, as well as mammals.
- 118C. Comparative Endocrinology Laboratory. (2) I. Mr. Bern  
Prerequisite: courses 4 and 118 (course 118 may be taken concurrently).  
Laboratory exercises and demonstrations illustrating hormonal mechanisms. Enrollment limited to ten students.



- 119A-119B. Optics and Metrology in Biology. (2-2) Yr. Mr. Gullberg  
 119A. The theoretical principles and the critical use of the microscope, spectroscope, and other primary optical instruments. Open to students with upper division or graduate standing in biological or physical science.  
 119B. The theory and advanced technique of scientific photography, photomicrography, and special photometric methods. 119A is prerequisite to 119B.
- \*120A-120B. Electrical Measurements in Biology. (2-2) Yr. Mr. Gullberg  
 Lectures and laboratory.  
 Enrollment limited and requires consent of instructor.  
 An analytical study of direct and alternating current circuits and instruments used in biological research.
123. Invertebrate Embryology. (2) II. Mr. Berg  
 Prerequisite: course 100.  
 Special emphasis will be given to the experimental embryology of marine invertebrates.
- 123C. Invertebrate Embryology Laboratory. (2) II. Mr. Berg  
 Prerequisite: course 123.  
 Descriptive and experimental embryology of selected invertebrates.
- \*124. Invertebrate Physiology. (4) I. Mr. Smith  
 Lectures and laboratory.  
 Prerequisite: course 1A. Recommended: course 112 or a course in physiology.  
 Comparative physiology of the invertebrates, with individual laboratory problems on nutrition, respiration, excretion, coördination, and other functions. Enrollment limited to twelve students.
125. General Ecology. (2) II. Mr. Pitelka  
 Prerequisite: two semesters of upper division work in biology, or graduate status in a related field.  
 Structure and dynamics of natural populations of animals; mechanisms of population control and regulation; community relations, stressing terrestrial habitats.
- 125C. Field Ecology. (2) II. Mr. Pitelka  
 Prerequisite: courses 112 or 113 or equivalent, 125 (may be taken concurrently), and Botany 108.  
 Study of distribution, composition, and dynamic relations of terrestrial communities in central California; descriptive and quantitative methods. Enrollment limited to ten students.
128. Vertebrate Reproduction. (3) II. Mr. Pearson  
 Lectures and laboratory.  
 Prerequisite: course 100.  
 The reproductive biology of native vertebrate animals with special emphasis on mammals. Comparison of cycles and factors influencing reproductive physiology in natural populations.
135. Systematic Mammalogy. (2) I. Mr. Benson  
 Lecture and laboratory.  
 Prerequisite: courses 106 and 113.  
 Principles of classification and nomenclature; anatomy, relationships, and distribution of mammalian groups.

\* Not to be given, 1954-1955.

136. Ornithology. (2) I. Mr. Miller  
Lecture and laboratory.  
Prerequisite: course 113.  
Advanced study of classification, anatomy, and function in birds. Enrollment limited to ten students.
137. Herpetology. (2) II. Mr. Stebbins  
Lecture and laboratory.  
Prerequisite: course 113.  
Advanced study of classification, anatomy, and function in amphibians and reptiles.
138. Ichthyology. (4) II. Mr. Needham  
Lectures and laboratory.  
Prerequisite: course 1B and two semesters of upper division work in zoölogy. Recommended: courses 106 and 116.  
Structure, classification, and ecology of fishes, including the application of limnological methods to problems of fish culture and management.
- \*142A. Advanced Invertebrate Zoölogy. (4) I. Mr. Smith  
Lectures and laboratory.  
The biology of the sponges, coelenterates, echinoderms, and protochordates. Given every other year. Alternates with 142B.
- \*142B. Advanced Invertebrate Zoölogy. (4) II. Mr. Smith  
The biology of the annelids, arthropods, and molluscs. Given every other year. Alternates with 142A.
145. Advanced Wildlife Management. (3) II. Mr. Leopold  
Lectures and laboratory.  
Prerequisite: course 116.  
Manipulation of environments in the control of bird and mammal populations. Characteristics of wild populations. Field and laboratory techniques.
197. Extra Session Work. (1-4) The Staff  
Work on assigned topics carried on in the field, or in Berkeley when the University is not in session, under the direction of a member of the staff.
199. Special Study for Advanced Undergraduates. (1-4) I and II.  
The Staff (Mr. Eakin in charge)  
Prerequisite: senior standing with at least a B average in upper division courses in zoölogy; background courses in chosen subjects.

## GRADUATE COURSES

For admission to a graduate course a student should have permission of the instructor (which may be given to graduate students and seniors with not less than a B average), and should have 12 units of basic upper division work.

201. Seminar in Physicochemical Biology. (2) II. Mr. Mazia  
Prerequisite: courses 101 and 102 or consent of instructor.  
Seminar discussion of recent literature on the physicochemical organization of the cell and the physicochemical mechanisms underlying cell functions.
205. Seminar on Growth. (1) I. Mr. Harris  
Prerequisite: course 105 or consent of instructor.  
Review of special topics and current literature on growth. Topic for 1954: Regeneration and wound healing.

\* Not to be given, 1954-1955.

207. Seminar in Cytology. (1 or 2) II. Mr. Alfert  
Prerequisite: graduate standing and course 107.  
Critical discussion of basic problems and recent literature in descriptive cytology and cytochemistry.
208. Seminar in Invertebrate Zoölogy. (2) I and II. Mr. Hand, Mr. Smith  
I: Mr. Hand; II: Mr. Smith.  
Prerequisite: graduate standing and courses in invertebrate zoölogy.  
Topics will vary from year to year. May be repeated without duplication of credit.
- \*212. Advanced Marine Invertebrate Zoölogy. (4) Mr. Smith  
Given at the seashore in Summer Session I.
217. Seminar in Comparative Histopathology. (1) I and II. Mr. DeOme  
A presentation of normal and pathological material to illustrate the reaction of normal tissue to various environmental agents. Special emphasis is placed upon the neoplastic changes.
218. Seminar in Comparative Endocrinology. (1) I and II. Mr. Bern  
Prerequisite: graduate standing and course 118 or equivalent.  
I: Hormones and behavior; II: Discussion of current literature and review articles.
219. Seminar in Animal Ecology. (1) I. Mr. Pitelka  
Prerequisite: course 125 or consent of instructor.  
Review of special topics, with emphasis on current literature.
220. Seminar on Speciation in Vertebrates. (2) I. Mr. Miller, Mr. Benson  
Prerequisite: course 113.  
Problems of speciation and isolating mechanisms in vertebrates.
221. Seminar in Optics and Metrology. (2) II. Mr. Gullberg  
Prerequisite: courses 119A and 119B or consent of instructor.  
Critical evaluation of recent advances in instrumentation in biological research fields.
- \*222. Seminar in Wildlife Management and Population Dynamics. (2) II. Mr. Leopold  
Prerequisite: courses 116 and 145 or consent of instructor.  
Review of current research by students; review of literature and special topics.
223. Seminar in Fisheries Management. (2) I. Mr. Needham  
Prerequisite: courses 116 and 138.  
Analysis of fish population problems including review of recent research, special phases, and work of students.
224. Research. (1-8) I and II. The Staff (Mr. Eakin in charge)  
Original study on special topics in laboratory, field, and museum. The work may be carried on in the laboratories at Berkeley, or in the field, or at a marine station at any season of the year. Credit awarded according to work accomplished.
240. Zoölogy Seminar. (No credit) I and II.  
The Staff (Mr. Alfert in charge, fall semester;  
Mr. Benson in charge, spring semester)  
Meetings for the presentation of original work by the faculty, visiting lecturers, and graduate students.

---

\* Not to be given, 1954-1955.

- \*241. Seminar in Protozoölogy and Parasitology. (2) I. Mr. Balamuth
242. Seminar in Experimental Morphogenesis. (2) I. Mr. Berg
243. Vertebrate Review. (1) II. Mr. Benson, Mr. Pitelka  
Review of current literature on ecology and evolution of higher vertebrates.  
May be repeated without duplication of credit.
244. Genetics Review. (1) I. Mr. Stern  
Prerequisite: graduate standing and one course in genetics.  
Review of current literature and of special topics.  
May be repeated without duplication of credit.
245. Seminar in Advanced Genetics. (2) II. Mr. Stern  
Prerequisite: graduate standing and a course in genetics.  
Topics will vary from year to year.
299. Special Study for Graduate Students. (1-4) I and II.  
The Staff (Mr. Eakin in charge)  
Prerequisite: graduate status in zoölogy and consent of instructor.  
Any properly qualified graduate student who wishes to pursue a problem through reading or other advanced study may do so if his proposed project is acceptable to a member of the staff.

#### MUSEUM OF VERTEBRATE ZOÖLOGY

This Museum, situated in the Life Sciences Building on the Berkeley campus, was founded and endowed by the late Miss Annie M. Alexander as a repository for specimens and information relative to the higher vertebrate animals of the Pacific Coast region of North America. The particular groups of animals with which it is concerned are the mammals, birds, reptiles, and amphibians; of these, it has a large and continually growing collection, as indicated (on March 22, 1954) by a total of 317,177 catalogue entries. The specimens, with the accompanying field notes, photographs, and maps, provide the basis for studies along systematic, evolutionary, ecologic, and economic lines. Persons interested in employing the facilities of the Museum may address the Director.

\* Not to be given, 1954-1955.

## INDEX

- A, Subject, 364  
Abbreviations used, 9  
Accounting, courses in, 54, 55, 56, 60  
Acoustics, 133  
Advertising, courses in, 58, 210, 320  
Aesthetics, 273, 275  
Agricultural, economics, 11  
    chemistry, 11  
    engineering, 15  
Agronomy, 15  
Airphoto interpretation, 123, 180  
Air science, 15  
Air transportation, 58  
Anatomy, 18  
Anthropology, 20  
    museum, 25  
Arabic, 254, 255  
Archaeology, 21, 22, 23, 75  
Architecture, 25  
Art, 80  
    University Gallery, 86  
Assyrian, 254  
Astronomy, 36  
Audio-visual education, 108
- Bacteriology, 39  
Biochemistry, 41  
Biology (*see* Botany, Physiology, Zoölogy)  
Botany, 48  
Buddhism, 267  
Bulgarian, 331  
Bureau,  
    of International Relations, 811  
    of Public Administration, 310  
Business administration, 52
- Calendar, 2  
Celtic, 161  
Ceramic engineering, 143  
Chemical engineering, 69  
Chemistry, 64  
Child development, 71  
    and family relationships, 197  
Chinese, 264  
City and regional planning, 72  
Civil engineering, 118  
Classics, 73  
Classification of courses, 9  
Clothing and textiles, 201  
Communication engineering, 130  
Comparative literature, 78  
Coöperatives, 13  
Coptic, 255  
Courses, classification of, 9  
Criminology, 79  
Czech, 338
- Danish, 335  
Debating, 363  
Decorative art, 88
- Design (*see* Landscape Architecture, Engineering Architecture, Art, and Decorative Art)  
Dietetics, 202  
Dramatic art, 86  
Drawing (*see* Art, Engineering)  
Dutch, 191
- Economics  
    courses in, 90  
Education  
    courses in, 98  
    special, 110  
    supervised teaching, 107  
Egyptian, 255  
Electrical engineering, 123  
Emergency Medicine, 110  
Engineering  
    ceramic, 143  
    civil, 118  
    courses in, 115  
    design, 135  
    electrical, 127  
    irrigation, 126  
    marine and naval architecture, 139  
    mechanical, 137  
    metallurgy, 144  
    mineral technology, 143  
    mining, 148  
    petroleum, 150  
    photogrammetry, 119, 123  
    transportation and traffic, 152  
English  
    comprehensive examination, 160  
    courses in, 156  
Entomology and parasitology, 163  
Explanatory note, 9  
Extension, University, 10
- Family economics, 204  
Family relationships, courses in, 204  
Farm management, 13  
Finance, 55, 92  
Food technology, 167  
Foreign literature, 168  
Foreign students  
    courses for, 362  
Forestry, 169  
French, 173
- Gallery, University Art, 36  
Genetics, 177  
Geography, 179  
Geological sciences, 181  
Geophysics, 183  
German, 188  
Gothic, 192  
Government  
    American, 298  
    Comparative, 302

- Greek, 75
- Hebrew, 254
- History, 192
- Home economics  
courses in, 201
- Home furnishing, 205
- Horticulture (*see* Pomology)
- Hydrology, 122
- Hygiene (*see* Public Health)
- Insurance, 56, 93, 235
- Interior decorating, 84
- International Relations, Bureau of, 308  
courses in, 299
- Irish, 161
- Irrigation, 126
- Italian, 206
- Japanese, 263  
art, 32, 34, 36
- Journalism, 208
- Jurisprudence (*see* Law)
- Korean, 263
- Landscape architecture, 212
- Latin, 76
- Law  
business, courses in, 54  
courses in, 214, 304
- Letters and Science  
list of courses, 7
- Librarianship, 217
- Lick Astronomical Department, 39
- Linguistics, 222
- Logic, 273  
mathematical, 229
- Lower division  
courses defined, 9
- Manufacturing, 117
- Marketing, 13, 57
- Mathematics, 224
- Mechanical engineering, 137
- Medical physics, 283
- Medical science, courses in (*see* Anatomy,  
Emergency Medicine, Physiological  
Chemistry, Physiology)
- Metallurgy, 144
- Meteorology, 180
- Microbiology, 40
- Military science and tactics, 239
- Mineral technology, 143
- Mineralogy, 187
- Mining, 148
- Modeling, 28
- Mongolian, 265
- Museum of Paleontology, 271  
of Anthropology, 25  
of Vertebrate Zoology, 372
- Music, 243
- Naval architecture, 139
- Naval science, 251
- Near Eastern languages, 253
- Nematology, 164
- Norse, 336
- Norwegian, 335
- Numbering of courses, 9
- Nursery school administration, 204
- Nursing, 255
- Nutrition and dietetics, 202
- Observatory, 38
- Oceanography, 259
- Optics, 261, 286, 369
- Optometry, 259
- Oriental art, 32
- Oriental languages, 263
- Paleontology, 268  
museum of, 271
- Parasitology, 163
- Persian, 254
- Personnel administration, courses in, 57,  
306
- Petroleum engineering, 150
- Pharmacology, 45
- Philology, 334 (and *see* under the various  
languages)
- Philosophy, 272
- Phonetics, 223, 334, 363
- Photogrammetry, 119, 123, 172
- Physical education, 276
- Physics  
courses in, 282  
engineering, 283
- Physiological chemistry, 46
- Physiological optics, 262
- Physiology, 290
- Planning, city and regional, 72
- Plant biochemistry, 46
- Plant nutrition, 293
- Plant pathology, 294
- Plant physiology, 50
- Playwriting, 88
- Polish, 337
- Political science, 296
- Pomology, 311
- Portuguese, 356
- Poultry husbandry, 311
- Professional courses, 10
- Psychology, 312
- Public administration, Bureau of, 310  
courses in, 299
- Public Health, 323
- Radio communication, 129
- Range management, 332
- Real estate, 59
- Recreation, 279
- Refrigeration, 138
- Resident courses, 10
- Romanic philology, 334
- Romanic languages (*see* under French,  
Italian, Spanish)
- Russian, 337
- Sanitary engineering, 121
- Sanskrit, 77
- Scandinavian, 335

- Sciences (*see* under the various departments)  
 Sculpture, 28, 29  
 Seismology, 185  
 Semantics, 363  
 Semitic languages (*see* Near Eastern languages)  
 Serbo-Croatian, 337  
 Siamese, 266  
 Slavic languages and literatures, 337  
 Social institutions, 346  
 Social welfare, 259, 341  
 Sociology and social institutions, 346  
 Soils, 353  
     soil science, 353  
 Spanish, 356  
 Special education, courses in, 110  
 Special study courses, 9  
 Speech, 360  
 Stagecrafts, 88  
 Statistics, courses in economics, 90, 92, 95  
     in education, 99, 103  
     in mathematics, 233  
     in psychology, 316  
     in public health, 328  
     in sociology and social institutions, 348  
 Subject A, 364  
 Sumerian, 254  
 Supervised teaching, courses in, 107  
 Surveying, 115  
 Swedish, 335  
 Syriac, 254  
 Teacher-training courses, 10  
 Textiles, 85, 205  
 Thai, 266  
 Tibetan, 265  
 Ukrainian, 338  
 University Extension, 10  
 University Theater, 87  
 Upper division courses defined, 9  
 Vegetable crops, 365  
 Viruses, biochemistry of, 45  
 Welfare, social, 259, 341  
 Wildlife conservation, 368, 370  
 Year courses, 9  
 Zoölogy, 365  
 Zymology, 167