

UNIVERSITY
OF
CALIFORNIA

GENERAL
CATALOGUE

1951 - 1952

Office of the Registrar
University of California
Davis, California



BULLETIN

General Catalogue

Primarily for Students in the
DEPARTMENTS AT BERKELEY

Fall and Spring Semesters
1951-1952

SEPTEMBER 1, 1951

For Sale by the

ASSOCIATED STUDENTS' STORE

PRICE, TWENTY-FIVE CENTS

UNIVERSITY OF CALIFORNIA

University of California Bulletin

PUBLISHED AT BERKELEY, CALIFORNIA

Volume XLVI • September 1, 1951 • Number 7

A series in the administrative bulletins of the University of California. Entered July 1, 1911, at the Post Office at Berkeley, California, as second-class matter under the Act of Congress of August 24, 1912 (which supersedes the Act of July 16, 1894). Issued three times a month, January through October.



All announcements herein are subject to revision. Changes in the list of Officers of Administration and Instruction may be made subsequent to the date of publication, September 1, 1951.

UNIVERSITY OF CALIFORNIA

General Catalogue

Admission and Degree Requirements

*Announcement of Graduate and
Undergraduate Courses of Instruction*

FALL AND SPRING SEMESTERS

1951-1952

SEPTEMBER 1, 1951

Primarily for Students in the
DEPARTMENTS AT BERKELEY

BERKELEY, CALIFORNIA

Published by

UNIVERSITY OF CALIFORNIA PRESS • BERKELEY AND LOS ANGELES

CALENDAR, FALL SEMESTER, 1951-1952*

Referring Primarily to the Departments of the University at Berkeley

July 16, Monday	Last day for filing credentials and applications for admission to graduate standing.
Aug. 15, Wednesday	Final date for applications for admission to the fall semester and credentials to be filed with the Director of Admissions. Credentials received as late as this may not be evaluated in time for the enrollment of the student during the regular registration period.
Aug. 23, Thursday	Applications for readmission to the fall semester to be filed with the Registrar by former students, graduate and undergraduate.
Sept. 3, Monday	Labor Day—an academic and administrative holiday.
Sept. 17, Monday	Fall semester begins.
Sept. 17, Monday	Mathematics 8 and 8A Qualifying Examination 10:30 A.M. to 12 M.
Sept. 17, Monday	Subject A Examination, 2 to 5 P.M.
Sept. 18, Tuesday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the fall semester.
Sept. 19, Wednesday	
Sept. 20, Thursday	
Sept. 20, Thursday	Chemistry 1A Aptitude Test, 4 to 5 P.M.
Sept. 24, Monday	Instruction begins.
Oct. 5, Friday	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, 1952, file announcement of candidacy before 5 P.M., at the office of the Registrar, Administration Building.
Oct. 5, Friday	Last day for filing applications in candidacy for all master's degrees, and the degree of Engineer to be conferred in January, 1952; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 12, Friday	Last day for filing applications in candidacy for professional higher degrees (except the degree of Engineer), and for the degree of Doctor of Philosophy, to be conferred in June, 1952; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 29, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in January, 1952; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Nov. 16, Friday	Last day for filing in final form with the committees in charge theses for professional higher degrees (except the degree of Engineer) and for the degree of Doctor of Philosophy, to be conferred in January, 1952.
Nov. 22, Thursday	Thanksgiving Day—an academic and administrative holiday.
Dec. 15, Saturday	Last day for filing credentials and applications for admission to graduate standing.
Dec. 21, Friday	Last day for filing in final form with the committees in charge theses for master's degrees and the degree of Engineer, to be conferred in January, 1952.
Dec. 24, Monday	} Christmas Recess—an academic holiday.
Jan. 5, Saturday	
Dec. 24, Monday	} Christmas Holiday—academic and administrative.
Dec. 25, Tuesday	
Dec. 31, Monday	
Dec. 31, Monday	} Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1952-1953.
Jan. 1, Tuesday	
Jan. 7, Monday	} New Year's Holiday—academic and administrative.
Jan. 21, Monday	
Jan. 31, Thursday	Instruction resumes.
Jan. 31, Thursday	} Final examinations in the departments at Berkeley.
Jan. 31, Thursday	
Jan. 31, Thursday	Fall semester ends.

* See footnote on next page.

CALENDAR, SPRING SEMESTER, 1952*

Referring Primarily to the Departments of the University at Berkeley

Jan. 15, Tuesday	Applications for admission to the spring semester and credentials to be filed with the Director of Admissions.
Jan. 17, Thursday	Applications for readmission to the spring semester to be filed with the Registrar by former students, graduate and undergraduate.
Feb. 11, Monday	Spring semester begins.
Feb. 12, Tuesday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the spring semester.
Feb. 13, Wednesday	
Feb. 14, Thursday	
Feb. 18, Monday	Instruction begins.
Feb. 20, Wednesday	Last day for filing applications for fellowships and graduate scholarships for 1952-1953.
Feb. 22, Friday	Washington's Birthday—an academic and administrative holiday.
Feb. 29, Friday	Last day for filing applications in candidacy for all master's degrees and the degree of Engineer, to be conferred in June, 1952; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 1, Saturday	Last day for entering students to file applications for undergraduate scholarships for 1952-1953.
Mar. 6, Thursday	All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in June, 1952, file announcement of candidacy before 5 P.M., at the office of the Registrar, Administration Building.
Mar. 7, Friday	Last day for filing applications in candidacy for professional higher degrees (except the degree of Engineer) and for the degree of Doctor of Philosophy, to be conferred in September, 1952; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 10, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula, to be received in June, 1952; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Apr. 4, Friday	Last day for filing in final form with the committees in charge theses for professional higher degrees (except the degree of Engineer) and for the degree of Doctor of Philosophy, to be conferred in June, 1952.
Apr. 28, Monday	} Spring recess—an academic holiday.
May 3, Saturday	
May 19, Monday	
May 30, Friday	Last day for filing in final form with the committees in charge theses for master's degrees and the degree of Engineer, to be conferred in June, 1952.
June 9, Monday	Memorial Day—an academic and administrative holiday.
June 19, Thursday	} Final examinations in the departments at Berkeley.
June 19, Thursday	
	Spring semester ends.

* *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.

CONTENTS

	PAGE
Regents of the University	6
Administrative staff	7

THE UNIVERSITY

Composition of the University	11
Administration	13
Survey of curricula	13
The four undergraduate colleges	13
Professional curricula	14
The professional schools	14
The professional colleges	16
Graduate curricula in engineering	16
Special professional curricula	16
University of California, Los Angeles	17
Summer Sessions	18
University Extension	18
The University Library	19

ADMISSION TO THE UNIVERSITY

Admission in undergraduate status	20
Admission in freshman standing	20
Admission on the basis of the high school record	20
Responsibility of high school authorities	21
Preparation for University curricula	22
Admission by examination	22
Removal of admission deficiencies	22
Admission in advanced standing	24
Removal of scholarship deficiencies by applicants from other colleges	24
Special requirements for engineering	24
Limitation of enrollment of out-of-state applicants	25
Admission of returning members of the armed forces	26
Admission of special students	26
Admission from schools and colleges in foreign countries	26
Late admission and registration	27
Admission in graduate standing	27

GENERAL REGULATIONS

Routine of registration	30
Medical and physical examination	30
Student Health Service	31
Physical Education and use of gymnasiums	31
Subject A: English Composition	32
American History and Institutions	33
Military Science	33
Naval Science	34
Study-list regulations	35
Candidacy for degrees	35
Change of college or major	36
Honors	36
Credit and scholarship	36
Grades of scholarship; grade points	37

	PAGE
Minimum scholarship requirements	37
Credit by examination	39
Final examinations	39
Removal of deficiencies	40
Transcript of record	41
Leave of absence and honorable dismissal	41
Discipline	42
Student self-government	42

MISCELLANEOUS INFORMATION

Site, climate, and transportation	43
General expenses and fees	43
Rules governing residence	46
Living accommodations	46
Bureau of Occupations	48
Student employment	48
Senior and alumni employment	49
Bureau of School and College Placement	49
Veterans Information	49
Scholarships, prizes, and loans	50

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

College of Letters and Science	51
Description of group majors and curricula	57
Honors	70
College of Agriculture	71
College of Chemistry	82
College of Dentistry	85
College of Engineering	87
College of Pharmacy	99
Schools of:	
Architecture	100
Business Administration	102
Criminology	105
Education	109
Forestry	114
Law	118
Librarianship	121
Medicine	122
Nursing	126
Optometry	129
Public Health	131
Social Welfare	135
Curriculum in Hospital Dietetics	137
Institute of Industrial Relations	138
Institute of Slavic Studies	138
Graduate Division	138

COURSES OF INSTRUCTION

Courses of instruction offered in the departments at Berkeley	139
---	-----



Index	497
-----------------	-----

THE REGENTS OF THE UNIVERSITY

REGENTS EX OFFICIO

- His Excellency, EARL WARREN, B.L., J.D.
Governor of California and President of
the Regents
Sacramento 14
- GOODWIN J. KNIGHT, A.B.
Lieutenant-Governor of California
State bldg, Los Angeles 12
- SAM L. COLLINS
Speaker of the Assembly
Chapman bldg, Fullerton
- ROY E. SIMPSON, M.A., Litt.D.
State Superintendent of Public Instruc-
tion
581 Library and Courts bldg,
Sacramento 14
- ARTHUR J. McFADDEN, B.S., LL.B.
President of the State Board of Agricul-
ture
1228 N Broadway, Santa Ana
- WILLIAM G. MERCHANT
President of the Mechanics' Institute
804 Mechanics' Institute bldg,
San Francisco 4
- MAYNARD J. TOLL, A.B.
President, Alumni Association of Uni-
versity of California
488 S Spring st, Los Angeles 18
- ROBERT GORDON SPROUL, B.S., LL.D.,
Litt.D.
President of the University
250 Administration bldg, Berkeley 4
208 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 FRANCOIS NEYLAN, LL.D. (1960)
Crocker First National Bank bldg, San
Francisco 4
- SIDNEY M. EHREMAN, B.L., LL.B. (1952)
700 Nevada Bank bldg, San Francisco 4
- FRED MOYER JORDAN, A.B. (1954)
4427 1/2 Moorpark way, North Hollywood
- EDWIN W. PAULEY, B.S. (1954)
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 Market st, San Francisco 4
- NORMAN F. SPRAGUE, D.O. (1952)
740 S Broadway, Los Angeles 14
- VICTOR R. HANSEN, LL.B. (1962)
Superior Court, Courthouse, Los Angeles
12
- EARL J. FENSTON, 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.,
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

OFFICERS OF THE REGENTS

- His Excellency, Earl Warren, B.L., J.D.
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 of the University—
Business Affairs
222 Administration bldg, Berkeley 4
- Olof Lundberg, O.P.A.
Controller
401 Administration bldg, Berkeley 4
- Jno. U. Calkins, Jr., B.L., J.D.
Attorney
910 Crocker bldg, San Francisco 4
- Ashley H. Conard, B.L., J.D.
Associate Attorney for the Regents and
Attorney in Residence Matters
910 Crocker bldg, San Francisco 4
- George D. Mallory, A.B.
Assistant Treasurer and Assistant
Secretary
240 Administration bldg, Berkeley 4
- George F. Taylor, B.S.
Assistant Secretary
101 Administration bldg, Los Angeles 24
- Marjorie J. Woolman
Assistant Secretary
240 Administration bldg, Berkeley 4

THE UNIVERSITY OF CALIFORNIA

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

ADMINISTRATIVE STAFF

President of the University:

Robert G. Sproul
250 Administration bldg, Berkeley 4
203 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:
Claude B. Hutchison

101 Giannini Hall, Berkeley 4

Chancellor of the University at Los

Angeles:

Interim Administrative Committee:

Dean Vern O. Knudsen (*Chairman*)
Dean Paul A. Dodd
Dean Stafford L. Warren
203 Administration bldg, Los Angeles 24

Vice-President—University Extension:

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

Vice-President—Business Affairs:

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

Vice-President—Medical and Health

Sciences:

Provost of Santa Barbara College:

J. Harold Williams
110 Administration bldg, Santa Barbara

Provost of Riverside Campus:

Gordon S. Watkins
College of Agriculture, Riverside

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*
101 Administration bldg, Los Angeles 24

Controller:

Olof Lundberg
401 Administration bldg, Berkeley 4

Budget Officer:

Ellis J. Groff
239C Administration bldg, Berkeley 4

♥ On military leave.

Attorney for the Regents:

Jno. U. Calkins, Jr.
Ashley H. Conard, *Associate Attorney*
for the Regents and Attorney in Resi-
dence Matters
910 Crocker bldg, San Francisco 4

Assistant to the President:

George A. Pettitt
225 Administration bldg, Berkeley 4

Director of Admissions:

Herman A. Spindt
127 Administration bldg, Berkeley 4
10 Administration bldg, Los Angeles 24
Edgar L. Lazier, *Associate Director*
Miss Elizabeth M. Roberts, *Assistant*
Director
10 Administration bldg, Los Angeles 24

Registrars and Recorders:

Thomas B. Steel, *Registrar*
Clinton C. Gilliam, *Assistant Registrar*
Miss Virginia F. Green, *Assistant Reg-*
istrar
Hobart M. Lovett, *Assistant Registrar*
John T. Peterson, *Assistant Registrar*
128 Administration bldg, Berkeley 4
William C. Pomeroy, *Registrar*
Mrs. Carmelita B. Stanley, *Assistant*
Registrar
146 Administration bldg, Los Angeles 24

♥ *Jerry H. Clark, Registrar*

Lewis F. Walton, *Acting Registrar*
105 Administration bldg, Santa Barbara
Mrs. M. Helen Chryst, *Recorder*
Medical Center, San Francisco 22
Howard B. Shontz, *Registrar*
120 Library-Administration Building,
Davis

Deans of the Graduate Division:

Northern Section:
William R. Dennes
James M. Cline, *Associate Dean*
Francis A. Jenkins, *Associate Dean*
Morris A. Stewart, *Associate Dean*
102 Administration bldg, Berkeley 4
Southern Section:
Vern O. Knudsen
Gustave O. Arlt, *Associate Dean*
136 Administration bldg, Los Angeles 24

Deans of Students:

Hurford E. Stone
—, *Dean of Women*
Miss Alice G. Hoyt, *Associate Dean of*
Women
Clinton C. Conrad, *Assistant Dean*
Chaffee E. Hall, Jr., *Assistant Dean*

- Alexander S. Lévens, *Assistant Dean*
 Mrs. Catharine DeMotte Quire, *Assistant Dean of Women*
 Mrs. Ruth N. Donnelly, *Housing Supervisor*
 201 Administration bldg, Berkeley 4
 Milton E. Hahn
 Miss Jessie Ruhlman, *Associate Dean*
 Miss Elizabeth Hartshorn, *Assistant Dean*
 239 Administration bldg, Los Angeles 24
 W. E. Hayes, *Acting Dean of Men*
 106 Administration bldg, Santa Barbara
 Miss Helen E. Sweet, *Dean of Women*
 104 Administration bldg, Santa Barbara
 J. Price Gittinger, *Supervisor of Student Affairs*
 206 Library-Administration bldg, Davis
- Deans of the College of Agriculture:*
 Claude B. Hutchison
 Stanley B. Freeborn, *Assistant Dean*
 101 Giannini Hall, Berkeley 4
 Knowles A. Ryerson, *Assistant Dean*
 106 Library-Administration Building, Davis
 Robert W. Hodgson, *Assistant Dean*
 146 Physics-Biology bldg, Los Angeles 24
- Deans of the College of Applied Arts:*
 David F. Jackey
 214 Josiah Royce Hall, Los Angeles 24
 John C. Snidecor, *Acting Divisional Dean of Applied Arts*
 107 Administration bldg, Santa Barbara
- Dean of the College of Chemistry:*
 Kenneth S. Pitzer
 110 Gilman Hall, Berkeley 4
- Dean of the College of Dentistry:*
 Willard C. Fleming
 Medical Center, Third and Parnassus avs, San Francisco 22
- Deans of the Colleges of Engineering:*
 Morrrough P. O'Brien
 Everett D. Howe, *Associate Dean*
 Burtis L. Robertson, *Assistant Dean*
 218 Engineering bldg, Berkeley 4
 Llewellyn M. K. Boelter
 Wesley L. Orr, *Assistant Dean*
 3086 Engineering bldg, Los Angeles 24
- Dean of Hastings College of The Law:*
 David E. Snodgrass
 California bldg, 515 Van Ness av, San Francisco 2
- Deans of the Colleges of Letters and Science:*
 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
 Herbert A. Young, University of California, Davis
 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*
 202 Administration bldg, Los Angeles 24
 G. Hand, *Acting Divisional Dean of Liberal Arts*
 109 Administration bldg, Santa Barbara
- Dean of the College of Pharmacy:*
 Troy C. Daniels
 John J. Eiler, *Assistant Dean*
 Medical Center, Third and Parnassus avs, San Francisco 22
- Dean of the School of Architecture:*
 William W. Wurster
 1 Architecture bldg, Berkeley 4
- Deans of the Schools of Business Administration:*
 Ewald T. Grether
 Roy W. Jastram, *Assistant Dean*
 113 South Hall, Berkeley 4
 Neil H. Jacoby
 G. W. Robbins, *Associate Dean*
 207 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
 206 Haviland Hall, Berkeley 4
 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
 219 Law bldg, Berkeley 4
 William N. Keeler, *Assistant Dean*
 227 Law bldg, Berkeley 4
 L. Dale Coffman
 124 Building 3P, 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*
 Medical Center, Third and Parnassus avs, San Francisco 22
 Stafford L. Warren
 Norman B. Nelson, *Assistant Dean*
 Temporary Medical School bldg, Los Angeles 24
- Deans of the Schools of Nursing:*
 Miss Margaret A. Tracy
 Miss Pearl Castile, *Assistant Dean*
 Miss Mildred E. Newton, *Assistant Dean*
 3574 Life Sciences bldg, Berkeley 4
 Medical Center, Third and Parnassus avs, San Francisco 22
 Miss Lulu K. Wolf
 10 Royce Hall, Los Angeles 24
- Dean of the School of Optometry:*
 Kenneth B. Stoddard
 214 Optometry bldg, Berkeley 4

Administrative Staff

9

Dean of the School of Public Health:

Charles E. Smith
218 Building T-4, Berkeley 4

Deans of the Schools of Social Welfare:

Milton Chernin
2400 Allston way, Berkeley 4
Donald S. Howard
26 Building 1A, Los Angeles 24

Dean of the School of Veterinary Medicine:

George H. Hart
Veterinary Science Building, Davis

Director of Relations with Schools:

Hiram W. Edwards
Miss Grace B. Bird, *Associate Director*
Vern W. Robinson, *Associate Director*
Raymond H. Fisher, *Assistant Director*
Owen Guinn Smith, *Assistant Director*
119 Administration bldg, Berkeley 4
130 Administration bldg, Los Angeles 24

University Extension:

Baldwin M. Woods, *Vice-President—*
University Extension
Thomas N. Barrows, *Associate Director*
—, *Business Manager*
University Extension, Berkeley 4

Paul H. Sheats, *Associate Director*
Abbott Kaplan, *Assistant Director*
—, *Business Manager*
Building 6A, Los Angeles 24
Emanuel E. Ericson, *Assistant Director*
108 Industrial Education bldg,
Santa Barbara

Director of the George Williams Hooper Foundation (for Medical Research):

Karl F. Meyer
Medical Center, Third and Parnassus
avs, San Francisco 22

Director of the Lick Observatory:

C. Donald Shane
Lick Observatory, Mount Hamilton

Director of the Scripps Institution of Oceanography:

Roger R. Revelle, *Director*
Scripps Institution of Oceanography,
La Jolla

Director of the Agricultural Experiment Station:

Paul F. Sharp
Stanley B. Freeborn, *Assistant Director*
108 Giannini Hall, Berkeley 4

Director of the Citrus Experiment Station:

Leon D. Batchelor
Citrus Experiment Station, Riverside

Director of Agricultural Extension:

J. Earl Coke
140 Giannini Hall, Berkeley 4

Director of the California School of Fine Arts:

Ernest K. Mundt
800 Chestnut st, San Francisco 11

Librarians:

Donald Coney
*Douglas W. Bryant, *Assistant Librarian*
Marion A. Milczewski, *Assistant*
Librarian
245 Library Annex, Berkeley 4

Lawrence C. Powell
Robert G. Vosper, *Associate Librarian*
232 Library, Los Angeles 24

John B. de C. M. Saunders
Medical Center, San Francisco 22

Miss Ruth Ragan
Scripps Institution of Oceanography, La
Jolla

Miss Margaret S. Buvens
Citrus Experiment Station, Riverside
Donald C. Davidson
200B Administration bldg, Santa Bar-
bara

Business Office:

James H. Corley, *Vice-President—Busi-*
ness Affairs

222 Administration bldg, Berkeley 4
101 Administration bldg, Los Angeles 24

William J. Norton, *Business Manager*
311 Administration bldg, Berkeley 4

George F. Taylor, *Business Manager*
101 Administration bldg, Los Angeles 24

Ira F. Smith, *Business Manager*
University of California, Davis

W. D. Drew, *Business Manager*
Citrus Experiment Station, Riverside

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

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

Kenneth M. Eastman, *Administrator*
Temporary Medical School Building,
Los Angeles 24

Harold H. Hixson, *Assistant Adminis-*
trator and Business Manager

Richard W. Blaisdel, *Assistant Adminis-*
trator and Assistant Business Man-
ager

102 University Hospital, San Francisco
22

Office of the Controller:

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

Robert A. Rogers, *Principal Accountant*
110 Administration bldg, Los Angeles 24

Lawrence N. Jacobs, *Senior Accountant*
Building C, Santa Barbara

E. C. Linsley, *Accounting Officer*
Medical Center, San Francisco 22

M. F. Cook, *Senior Accountant*
106 Library-Administration Building,
Davis

W. D. Drew, *Senior Accountant*
Citrus Experiment Station, Riverside

Chief Purchasing Agent:

Lewis G. Baker
F. S. Harter, *Purchasing Agent*
318 Administration bldg, Berkeley 4

David L. Wilt, *Purchasing Agent*
5 Administration bldg, Los Angeles 24

Manager of Insurance and Retirement Systems:

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

♡ On military leave.

* Absent on leave, fall semester, 1951-1952.

Personnel Officers :

Boynston S. Kaiser
329 Administration bldg, Berkeley 4
Miss Mildred L. Foreman
Building 3P, Los Angeles 24

Offices of Public Information :

Maynard T. Morris, *Manager*
101 Administration bldg, Berkeley 4
Andrew J. Hamilton, *Manager*
9 Administration bldg, Los Angeles 24

George Obern, *Manager*

Donald W. Wieder
118 Administration bldg, Santa Barbara

Offices of Publications :

William F. Calkins, *Manager of Agricultural Publications*
22 Giannini Hall, Berkeley 4
2 Building T-4, Davis

_____, *Manager of Official Publications*
1 Administration bldg, Berkeley 4

Office of Radio Administration :

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

Manager of the University Press :

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

Manager of the Bureau of School and College Placement :

Lloyd D. Bernard
207 Administration bldg, Berkeley 4
123 Education bldg, Los Angeles 24

Bureau of Occupations :

Miss Vera Christie, *Placement Office Manager*
South Hall Annex, Berkeley 4
Miss Mildred L. Foreman, *Placement Office Manager*
153 Building 3P, Los Angeles 24

University Physicians :

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

Evan K. Perkins
Miss Elizabeth A. Davis, *Director, Student Health Service*
Medical Center, San Francisco 22
Donald S. MacKinnon, *Director, Student Health Service*

Gertrude T. Huberty, *Senior Staff Physician*
Building 3T, Los Angeles 24
Wilfred T. Robbins, Jr., *Director of Student Health Service*
Santa Barbara College, Santa Barbara
J. Homer Woolsey, *Director and Surgeon, Student Health Service*
University of California, Davis

Director of Hospitals and Infirmaries :

Richard J. Stull
University Hospital, Medical Center,
San Francisco 22

Buildings and Grounds :

John W. Aljets, *Principal Superintendent*

Grounds and Buildings, Berkeley 4
Laurance H. Sweeney, *Principal Superintendent*

106 Service bldg, Los Angeles 24
William H. Dufton, *Principal Superintendent*
Medical Center, San Francisco 22

Lewis T. Suber, Jr., *Senior Superintendent of Grounds and Buildings*
University of California, Davis

Don D. Wilkerson, *Grounds and Buildings Superintendent*
Scripps Institution of Oceanography, La Jolla

Henning J. Noren, *Grounds and Buildings Superintendent*

Lick Observatory, Mount Hamilton
Henry U. Meyer, *Grounds and Buildings Senior General Mechanic*

Citrus Experiment Station, Riverside
William F. Madden, *Senior Superintendent Grounds and Buildings*
Santa Barbara College, Santa Barbara

Foreign Student Advisers :

Allen O. Blaisdel
International House, Berkeley 4
Clifford H. Prator
232 Administration bldg, Los Angeles 24

VETERANS INFORMATION

Robert W. Webb, *Coördinator*
108 Building B, Santa Barbara

James G. Siler, *Supervisor of Special Services*
Office Building F, Berkeley 4

Byron H. Atkinson, *Supervisor of Special Services*
317 Administration bldg, Los Angeles 24

Lyle G. Reynolds, *Assistant Dean of Men*
109 Administration bldg, Santa Barbara

Troy O. Daniels, *Dean, College of Pharmacy*
Medical Center, San Francisco 22

J. Price Gittinger, *Supervisor of Student Affairs*

206 Library-Administration bldg, Davis
Mrs. Edythe G. Hutchins, *Senior Administrative Assistant*
University Extension bldg, Berkeley 4

Mrs. Myrtle Findley, *Extension Representative*
211 Building 5B, Los Angeles 24

Caleb A. Lewis, *Senior Extension Representative, San Diego Area*
1040 Fourth av, San Diego

Mrs. Florene M. Harrison, *Extension Representative, Santa Barbara Area*
906 Santa Barbara st, Santa Barbara

♡ On military leave.

THE UNIVERSITY OF CALIFORNIA

FOUNDED 1868

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

I. AT BERKELEY

The Colleges of

Letters and Science

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

Chemistry

Engineering

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

The Schools of

Architecture

Business Administration

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 California Museum of Vertebrate Zoölogy

The Museum of Paleontology

The Anthropological Museum

The Heller Committee for Research in Social Economics

The Institute of Child Welfare

The Institute of East Asiatic Studies

The Institute of Engineering Research

The Institute of Experimental Biology

The Institute of Geophysics (in part)

The Institute of Industrial Relations (in part)

The Institute of Slavic Studies

The Institute of Transportation and Traffic Engineering

The Bureau of Business and Economic Research

The Bureau of International Relations

The Bureau of Public Administration

The William H. Crocker Radiation Laboratory

The University Art Gallery

The University of California Press

Departments of Instruction in the Colleges at Berkeley

Agriculture (including Plant Science, Animal Science, Entomology and Parasitology, Agricultural Economics, Food Technology, Home Economics, Soil Chemistry, Soil Science, and Landscape Architecture), Anatomy,* Anthropology, Architecture, Art, Astronomy, Bacteriology, Biochemistry (including a division of the School of Medicine), 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, Forestry, French, Geography, Geological Sciences (and Mineralogy), German, History, Italian, Journalism, Law, Librarianship, Mathematics, Military Science and Tactics, Music, Naval Science, Near Eastern Languages, Nursing, Optometry (and Physiological Optics), Oriental Languages, Paleontology, Philosophy, Physical Education, Physics, Physiology,* Political Science, Psychology, Public Health, Romance Philology, Scandinavian Languages and Literature, Slavic Languages, Social Welfare, Sociology and Social Institutions, Spanish and Portuguese, Speech, Zoölogy.

II. AT LOS ANGELES†

The Colleges of

Letters and Science

Engineering

Applied Arts

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

Pharmacy (in part)

The Schools of

Business Administration

Education

Law

Medicine

Nursing

Public Health (in part)

Social Welfare

The Graduate Division (Southern Section)

The Bureau of Governmental Research

The Institute of Geophysics (in part)

The Institute of Industrial Relations (in part)

The Institute of Slavic Studies (in part)

The Institute of Transportation and Traffic Engineering (in part)

The Senator William Andrews Clark Memorial Library

The Los Angeles Medical Department (graduate instruction only)

III. AT SAN FRANCISCO

School of Medicine (second, third, and fourth years, including the University Hospital and Langley Porter Clinic)

School of Nursing (in part)

School of Public Health (in part)

The George Williams Hooper Foundation (for medical research)

College of Dentistry

College of Pharmacy

California School of Fine Arts

Hastings College of The Law

* A division of the School of Medicine.

† A more detailed description of instruction offered at Los Angeles will be found on page 17.

IV. AT DAVIS

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

V. AT RIVERSIDE

The College of Agriculture, including the Citrus Experiment Station.

VI. AT MOUNT HAMILTON

The Lick Astronomical Department (Lick Observatory).

VII. AT LA JOLLA

The Scripps Institution of Oceanography.

VIII. AT SANTA BARBARA

Santa Barbara College.

ELSEWHERE

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

ADMINISTRATION

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

SURVEY OF CURRICULA

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

THE FOUR UNDERGRADUATE COLLEGES

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

College of Letters and Science

Colleges of applied sciences—

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

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

* For a list of the administrative staff of the University at Berkeley, and elsewhere, see page 7.

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, business administration, city planning, criminology, dentistry, education, engineering, forestry, law, librarianship, medicine, pharmacy, public health, nursing, optometry, and social welfare. Full details of the respective curricula will be found in later pages of this bulletin.

The Professional Schools—

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

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

The School of 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.). Admission to the second curriculum, it is to be noted, is limited to applicants who hold both an academic bachelor's degree and a professional degree in law (LL.B.) from approved institutions.

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

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

Graduate Curricula in Engineering—

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

Special Professional Curricula—

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

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

nursing education; or (b) have completed the requirements of the B.S. degree in the curriculum for graduate nurses and in addition four months of supervised field practice in nursing education.

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

The course in physical therapy is given at the 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.

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

The University of California, Los Angeles, comprises: (a) the College of Letters and Science, with curricula leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science; (b) the College of Applied Arts, with curricula leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science; (c) the School of Business Administration, with curricula leading to the degrees of Bachelor of Science and Master of Business Administration; (d) the College of Agriculture, with curricula leading to the degree of Bachelor of Science; (e) the College of Engineering, with curricula leading to the degree of Bachelor of Science; (f) the School of Education, with teacher-training curricula leading to certificates of completion for the various elementary and secondary teaching credentials, and for the administrative credential; and with curricula leading to the degrees of Master of Education and Doctor of Education; (g) the School of Law, with curricula leading to the degrees of Bachelor of Laws, Master of Laws, and Doctor of the Science of Law; (h) the School of Medicine, with a curriculum leading to the degree of Doctor of Medicine; (i) the School of Nursing, with curricula leading to the degrees of Bachelor of Science and Master of Science; (j) the College of Pharmacy offering the first year of the curriculum of the College; and (k) the School of Social Welfare, with curricula leading to a certificate of completion and the degree of Master of Social Welfare. Graduate studies,

leading to the degrees of Master of Science and Master of Arts, and to the degrees of Doctor of Philosophy, and Doctor of Public Health are available in the Graduate Division, Southern Section.

SUMMER SESSIONS

During the summer the University conducts at Berkeley one or more sessions of six weeks' duration each. In 1951 two such summer sessions of six weeks each were conducted, the first session beginning June 18, and the second beginning July 30. Information concerning the Summer Sessions of 1952 will be published in the SUMMER SESSIONS bulletin, obtainable 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 Los Angeles campus, and on the Santa Barbara College campus.

UNIVERSITY EXTENSION

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

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

Five principal methods of instruction are used by University Extension:

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

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

(3) 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.

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

THE UNIVERSITY LIBRARY

The Library on the Berkeley campus of the University of California consists of the General Library with its sixteen branch libraries, about thirty departmental and special libraries, and some fifty staff and office collections. These groups, collectively known as the University Library, contain more than 1,665,000 volumes. Approximately 20,000 periodicals and serials are received currently.

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 Biology Library is a branch situated in the Life Sciences Building, conveniently serving faculty and students of the life sciences. Other branches, located near the departments which use them most, are the Architecture Library, Architecture Building; Astronomy Library, Students' Observatory; Chemistry Library, Gilman Hall; Engineering Library, Engineering Building; Forestry Library, Forestry Building; Geological Sciences Library, Bacon Hall; Lange Library of Education, Haviland Hall; Library School Library, Main Library Building; Matthew Memorial Library of Paleontology and the Mineral Technology Library, both in Hearst Memorial Mining Building; Music Library, Music Building; Optometry Library, School of Optometry Building; Physics Library, LeConte Hall; Public Health Library, Life Sciences Building; City and Regional Planning Library, City and Regional Planning 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 20,000 volumes for recreational reading. These books are available only to students and officers of the University for use within the Morrison Library room. Both the Bancroft Library and the Morrison Library are departments of the General Library.

Departmental and special libraries include the Law Library in Boalt Hall, used by the School of Law; 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 in T-11; 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. Borrowed materials may not be transferred to any other person. Specifically, the lending of books or periodicals by an authorized borrower to any person not authorized to draw books from the Library is prohibited, as is the signing of call cards by an authorized borrower for another person's use. In certain circumstances, the Library Loan Desk may give an authorized borrower special permission to let another person draw books in his name. A borrower is held responsible for any material borrowed in his name. Therefore, when a book is transferred from one authorized borrower to another, the original charge must be cancelled at the desk where it was made and a recharge made to the new borrower.

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. With the application for admission there must be filed a Vaccination Certificate showing successful vaccination against smallpox within the last seven years. This form will be furnished by the University and must be signed by a licensed physician or registered nurse.

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

Admission in Freshman Standing

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

ADMISSION ON THE BASIS OF THE HIGH SCHOOL RECORD

The applicant having filed formal application as directed above must have the secondary schools he has attended send to the 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 pages 24 and 25.)

1. Complete the high school courses listed under (a) to (f) below. Courses in the (a) to (f) list taken in the ninth grade need show passing marks only; courses in the (a) to (f) list taken in the tenth, eleventh and twelfth grades

* 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 June or July. 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.

must be passed with marks that will make an average of grade B. Courses in which a grade of D is received may not be counted either in reckoning the required scholarship or in satisfaction of the subject requirements. An A grade in one course will balance a C grade in another. Only courses used to meet the subject requirements are considered. Grades are considered on a semester basis, except from schools that give only year grades.

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

- (a) History 1 unit.—This requirement must be satisfied by one unit of United States history or one unit of United States history and civics.
- (b) English 3 units.—These may consist of any six semesters that give preparation in written and oral expression and in the reading and study of literature. Reading and study of contemporary literature may be included. The requirement in English must be satisfied by credit designated "English."
- (c) Mathematics 2 units.—These must consist of two semesters of elementary or advanced algebra, and two semesters of plane geometry, or solid geometry and trigonometry.
- (d) Science 1 unit.—This may consist of a year course in one field of science, namely, biology, botany, chemistry, physics, physical science, physiology, or zoology. The science selected must be an advanced (third- or fourth-year) laboratory science, and the two semesters must be in the same subject field.
- (e) Foreign language 2 units.—These must be in one language.
- (f) Advanced course chosen from one of the following:

- 1 (or 2) units.—1. Mathematics, a total of 1 unit (second-year algebra $\frac{1}{2}$ or 1 unit; solid geometry, $\frac{1}{2}$ unit; trigonometry, $\frac{1}{2}$ unit);
2. Foreign language, either 1 additional unit in the same foreign language offered under (e), or 2 units of a different foreign language;
3. Science, 1 unit of either chemistry or physics in addition to the science offered under (d) above.

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

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

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

- Third- and fourth-year English
- Third- and fourth-year mathematics
- Third- and fourth-year laboratory science
- Third- and fourth-year foreign language
- Third- and fourth-year history.

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 20, 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 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

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 a satisfactory score on the Scholastic Aptitude Test and on three achievement tests in subject fields. If the (a) to (f) list of subjects has not been completed with grades of C or better, the applicant should consult the Admissions Office in regard to the tests he must take. 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) Sixty units with at least an average of grade C in college transfer courses, or
- (b) A minimum of 40 units of college transfer courses with a grade point average of 1.2, or
- (c) A minimum of 30 units of college transfer courses with a grade point average of 1.3, or
- (d) A minimum of 15 units of college transfer courses with a grade point average of 1.5.

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

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 average grade C, and must serve, not merely as specific make-up of deficiencies, but also as a demonstration of ability to do college work successfully.
- (b) *Combination Program of the College of Agriculture at Davis*: For high school graduates with not more than three subject deficiencies among which may not be included algebra or plane geometry, a combination program is offered at the College of Agriculture of the University of California at Davis. Students cannot remove entrance deficiencies in the Two-Year Curriculum (nondegree course). See PROSPECTUS OF THE COLLEGE OF AGRICULTURE.
- (c) *Summer Session*: For students with only one or two deficiencies a six-week summer session or an eight-week summer session of the University of California or of an approved university, college, or junior college, may be used to make up the shortages, if the records are received in time for clearance. Summer Session programs should be approved in advance by the 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, the Board of Admissions and Relations with Schools has approved an experimental plan of admission, limited to the years 1949-1953 inclusive. Under this plan an applicant from a California junior college or state college may be admitted on the basis of a record showing completion of at least 60 units of C average work or higher, in which must be included all of the subjects required for junior standing in the school or college of the University for which application is made.

* After a student has earned 70 units acceptable toward degree requirements (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.

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.

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.

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 who present 60 or more semester units of acceptable college credits, according to the evaluation by the Office of Admissions are classified as juniors or seniors. Junior and senior applicants from areas outside California, in addition to submitting transcripts must also submit a score on the College Transfer Test. This examination is administered by the Educational Testing Service, Box 592, Princeton, New Jersey, or Box 9896 Los Feliz Station, Los Angeles 27, California.

ADMISSION OF RETURNING MEMBERS OF THE ARMED FORCES

Some exceptions in the subject requirements for admission will be made for men and women who were for at least one year members of the United States military or naval forces during World War II, and whose service began before August 15, 1945. Such exceptions will apply, however, only when the scholarship record is high enough to indicate probable success in the University. Veterans whose scholastic records are good, and whose high school subject deficiencies total not more than 3 units, are encouraged to make application even though they may not have all of the usual requirements. A veteran with a good scholarship record but with subject deficiencies will be classified as a special student until deficiencies are removed, or until all of the requirements for junior standing in the college of his choice have been completed.

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 ex-

* See Limitation of Enrollment of Out-of-State Applicants, page 25.

change 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. Any applicant for admission to the College of Engineering who wishes to satisfy the entrance examination requirement before coming to this country, should take the Scholastic Aptitude Test and the Pre-engineering Science Comprehension Test of the College Entrance Examination Board.

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

LATE ADMISSION AND REGISTRATION

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

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

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

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

ADMISSION IN GRADUATE STANDING

Holders of bachelor's degrees from institutions of acceptable standing, representing the usual college course of four years, may, provided their scholarship record is satisfactory, be admitted to the Graduate Division, Northern Section, of the University of California upon presentation of official transcripts of record covering all college or university work completed to date together with official evidence of the degree conferred, with the proviso that the University of California may deny admission to graduate standing in cases where the scholarship record has not been satisfactory or where the undergraduate program has not been of such character as to furnish an adequate basis for ad-

vanced work leading to academic or professional higher degrees or certificates. This applies to colleges and schools within the University of California as well as to those outside. *In the absence of official records and official evidence of graduation or receipt of degree, registration will not in any case be permitted.*

Transcripts of students' records and all other official credentials are retained permanently in the files of the office of the Dean of the Graduate Division. The student must have an official transcript of his record (in addition to the record sent to the Dean of the Graduate Division) in his possession for conference with departmental advisers and for his own reference in planning a program of study. The Graduate Division office copy may not be borrowed for this or any 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; it should be accompanied by a money order or bank draft for \$5 in payment of the application fee.† *Please note that the application fee is chargeable to every person who files an application, and 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, it is possible that the student's registration may be delayed, thus making him liable for the late registration fee of \$2.

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

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

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

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

Each applicant is required, however, to file official evidence of satisfactory vaccination within seven years of the proposed date of registration.

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

Applicants for admission to the Graduate Division on credentials from universities and colleges in foreign countries are required to appear for the Examination in English for Foreign Students described in the preceding section, to

† 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.

‡ Veterans of World War II may furnish photostats of Honorable Discharge or Notice of Separation where the date of induction or latest date of immunization is within seven years of the proposed date of registration.

demonstrate whether or not their command of English is sufficient to permit them to profit by instruction in this University.

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

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

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

GENERAL REGULATIONS

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

ROUTINE OF REGISTRATION

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

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

All students must register with the Registrar their choice of courses to be pursued in any semester, on blanks provided for the purpose, at the time and place designated. Registration at a later date requires special permission. For further information, see under Late Admission and Registration, page 27.

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 include with his application for admission a certificate testifying to successful vaccination against smallpox within the last seven years. A form for this purpose is furnished by the University. Tests for tuberculosis are a part of the examination of all new students. Applicants for admission who have

contagious diseases will be excluded. Those having physical conditions, such as convulsive seizures, which grossly disturb the classwork of other students, should not apply for admission.

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

STUDENT HEALTH SERVICE

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

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

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

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

Dental Service: The hours of 9-10 a.m. and 2-4 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 INSTITUTIONS

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

1. By passing a single examination in American History and Institutions. The passing of this examination will not entitle the student to receive unit credit.
2. By completing any two of the following courses, subject to the conditions noted below: † XB7ABC or X7AB (University Extension); Business Administration 153 (not included in Letters and Science List of Courses); Economics 113, 152; History 8B, 17A, 17B, or XB17A, XB17B (University Extension), 167A, 167B, 172A, 172B, 173A, 173B, 173C, 174A, 174B, 176A, 176B, 177A, 177B, 187A, 187B; Political Science 1, XB1 (University Extension), 113, 115, 128, 140, 150, 151, 152, 154, 155, 157A, 157B, 159, 162, 172, 175, 182; Speech 137.
Any one of the above courses offered in the Summer Sessions is acceptable.
3. (a) By automatic equivalence granted for courses offered by collegiate institutions within the State of California in those cases where an official transcript of record from such an institution indicates satisfaction of the requirement by such courses.
(b) By presenting a certificate of completion of acceptable courses at other collegiate institutions. Certificates may be obtained from the office of the Supervisor.

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

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

MILITARY SCIENCE

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

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

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

course, his neglect will be reported to the Registrar, who, with the approval of the President, will notify the student that he is dismissed from the University. The Registrar will then inform the dean of the student's college or other officer in charge of the student's program of his dismissal. Reinstatement will be made only upon approval of the President of the University with the concurrence of the Professor of Military Science and Tactics.

The Reserve Officers Training Corps

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

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

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

NAVAL SCIENCE

Candidates for enrollment in the Naval Reserve Officers' Training Corps will be selected by the chairman of the department of Naval Science. These candidates are in addition to 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. In addition, two hours of military drill or practical work per week are required each semester. Upon successful completion of 24 units of naval science, and all other requirements for a first bachelor's degree in certain fields of study, graduating students are given officers' commissions in the U. S. Naval Reserve or Marine Corps Reserve. Upon selection, and agreement to serve for a two-year period of active duty, graduating students may be granted commissions in the regular Navy or Marine Corps. In addition to the other course requirements, Naval R.O.T.C. students must complete mathematics courses through

trigonometry by the end of the sophomore year; sufficient courses in English to achieve a proficiency in written and oral expression; and such instruction in swimming as is necessary to enable qualification as a Navy first-class swimmer. Candidates must contract to fulfill all the requirements of the four-year Naval R.O.T.C. curriculum, without serious interference with or from other academic work required for the bachelor's degree. Certain monetary advantages accrue to Naval R.O.T.C. students during their third and fourth years in the program.

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

STUDY-LIST REGULATIONS

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

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

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

Authority of instructors.—No student will be permitted to enter upon the study of any subject if, in the opinion of the instructor, he lacks the necessary preparation to 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 1951-1952 these dates are: Friday, October 5, for candidates who expect to complete their work in January, 1952, and Thursday, March 6, for candidates for graduation in June, 1952.

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 Univer-

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

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

CHANGE OF COLLEGE OR MAJOR

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

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

HONORS

Honor students include those who receive honorable mention with the degree of Associate in Arts in the College of Letters and Science, or upon attaining junior standing in the colleges of Agriculture, Chemistry, and Engineering, or in the schools of Architecture, Business Administration, Criminology, Forestry, 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 Chemistry, or the College of Pharmacy, in the School of Architecture, 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 (Berkeley), Chemistry, and Pharmacy; also Schools of Architecture, 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.

College of Engineering—

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

School of Optometry—

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

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

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

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

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

Graduate Division—

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

School of Medicine—

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

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 37). 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. In the courses of the Summer Sessions, however, the University does not provide reexaminations. A student who received grade B, C, or D in any course is not allowed a reexamination for the purpose of raising the grade. Concerning methods of raising nonpassing grades to passing grades, see under Removal of Deficiencies, below.

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

REMOVAL OF DEFICIENCIES

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

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

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

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

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

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

DISCIPLINE

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

Administration.—By authority of the Academic Senate, the President of the University is entrusted with the administration of student discipline with full power to act. He accomplishes this through the assistance of his teaching staff, the administration officers concerned with student welfare, and the Faculty-Administration Committee on Student Discipline under the chairmanship of the Dean of Students.

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

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

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

MISCELLANEOUS INFORMATION

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 non-professional course and who has been classified as a resident of the State is given below.

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

Expense Items	Minimum		Moderate		Liberal	
	Men	Women	Men	Women	Men	Women
Incidental Fee.....	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00
Books and Supplies.....	35.00	35.00	43.00	43.00	50.00	50.00
A.S.U.C. Membership.....	12.50	12.50	12.50	12.50	12.50	12.50
Board and Room.....	*400.00	*440.00	700.00	650.00	900.00	975.00
Miscellaneous (cleaning, laundry, drugs, etc.).....	75.00	100.00	100.00	150.00	200.00	200.00
Total.....	\$592.50	\$657.50	\$925.50	\$925.50	\$1232.50	\$1307.50

* 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 \$35 each semester, for both undergraduate and graduate students. This fee, which must be paid at the time of registration, covers certain expenses of students for use of laboratories, and library books, for athletic and gymnasium facilities and equipment, for lockers, for registration and graduation, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service with the aid of the visiting staff at Cowell Memorial Hospital and not elsewhere. No part of this fee is remitted to those students who may not desire to make use of all or any of these privileges. If a student 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 46. 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 \$185 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 \$35 to \$50 a year. Books and special equipment for students in the preprofessional and professional schools cost from \$50 to \$200. Exact information on these items may be obtained by writing directly to the school or department. Women students taking physical education are required to buy shoes which cost about \$2. Students failing the required examination in Subject A must pay a fee of \$20 for the course in Subject A (see page 32).

Membership in the Associated Students of the University costs \$12.50 each year (fall and spring semesters), and though membership is not obligatory, it is advisable. A membership card entitles the holder to a subscription to the

student newspaper, the *Daily Californian*; membership in the Henry Morse Stephens Memorial Student Union, which is the center of campus life; privilege of admission free or at reduced rates to athletic contests; and participation in all student affairs, including athletic, student body, and class activities.

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

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

Tuition in the academic colleges is free to students who have been residents of the State of California for a period of one year immediately preceding the opening day of the semester during which they propose to attend the University. Students who are classified as nonresidents are required to pay a tuition fee of \$150 each semester. This fee is in addition to the incidental fee. 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. For conditions of eligibility for exemption from, and of possible commutation of, this fee, see the ANNOUNCEMENT OF THE GRADUATE DIVISION.

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

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

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

Rules Governing Residence

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

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

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

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

Every person who has been, or who shall hereafter be classified as a 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 a card file 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 Villages. 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 \$325 and \$350 a semester. This price includes three meals per day. In the boarding houses for men, the price for a semester is between \$265 and \$315 a semester, and the boarding houses for women \$270

and \$370. The prices quoted for boarding houses do not include the price of lunches and Sunday meals, which average \$100 to \$125 a semester. In co-operative houses for single men, the price is approximately \$200 to \$205 a semester plus five hours of work a week. In co-operative houses for single women, the price is between \$190 and \$230 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.

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 women's residence card provided at the time of registration.

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

University Residence Halls for women include Stern Hall and the seven Fernwald Halls; namely, Mitchell, Peixotto, Richards, Oldenberg, Freeborn, Cheney, and Cunningham Halls. Stern Hall is a gift of Mrs. Sigmund Stern; it accommodates 89 undergraduate women. The cost for room and board is \$350 for the semester, payable in five installments. Applications for residence are available only during the months of April and November. Applications for the fall semester are available April 1 and must be returned to the Housing Office by April 30. Applications for the spring semester are available November 1 and must be returned to the Housing Office by November 30. The Fernwald Halls accommodate 466 women. Five of the halls house 78 undergraduate women each, and two of the halls house 38 undergraduate women each. The cost for room and board is \$323 for the semester, payable in five installments. Applications for residence for the fall semester will be available beginning April 1, and applications for residence for the spring semester will be available beginning November 1. Reservations in the University Residence Halls will not be open to women intending to participate in rushing.

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

The University Residence Hall for men, Bowles Hall, is a memorial to Philip Ernest Bowles, member of the Class of 1882 and for twelve years a Regent of the University. Two hundred and four undergraduate men can be accommodated. The cost for room and board is \$344 for the semester, payable in five installments. Applications for residence in Bowles Hall are available only during the months of April and November. Applications for the fall

semester are available April 1, and must be returned to the Housing Office by April 30. Applications for the spring semester are available November 1, and must be returned to the Housing Office by November 30. Reservations in Bowles Hall will not be open to men 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. Fraternity membership is by invitation only. All men students who are interested in membership in such groups should submit their names and addresses to the Office of the Dean of Students at once. From these, "rushing" lists will be compiled and distributed to the fraternities. The majority of the national sororities maintain chapters here. There are also several local sororities and clubs. Each of these organizations provides living quarters for its members. Membership in these organizations is by invitation, and women students who are interested in membership in a sorority or club may obtain information from the Dean of Women. Information about monthly rates, including dues and initiation and pledge fees, may be obtained by calling in person at the Dean of Students Office, room 201, Administration Building. As temporary accommodations are usually not available in boarding and lodging houses, students who anticipate living in fraternity or sorority houses during their first semester should make temporary living arrangements at hotels or with friends for the rushing period. Students who plan to go through rushing may not apply for the University Residence Halls.

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 office of 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 outside employment until he has had opportunity to adjust himself to new surroundings, to establish sound habits of study, and to maintain a good scholastic standing, 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 an average program of studies and give a maximum of twelve to eighteen hours a week to outside 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 possi-

bility of taking more than the minimum number of semesters required to obtain a degree, if he is to maintain his scholastic standing and his health, and to enjoy the advantages of University life. The student who is not physically strong or in good health should not attempt to be wholly self-supporting because of the danger of jeopardizing health and academic progress.

There is a limited number of part-time cash jobs available to students, but it is not always easy to fit an academic program to the employer's needs. In most cases programs must be arranged before referrals for employment can be given. 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 and expert stenographers have less difficulty than the unskilled women students in securing permanent part-time cash jobs, there is usually not a sufficient demand even for these workers at the time of registration to take care of all who apply for such work.

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

VETERANS INFORMATION

An office has been established by the University to maintain liaison between veterans and the Veterans Administration, the State Department of Veterans Affairs, and other agencies offering veterans educational benefits and to assist veterans in becoming assimilated into the life and spirit of the University. This office is located on Dana Street near Allston Way in Building F. Offices of the United States Veterans Administration are located as follows: Oakland Sub-Regional Office, 1305 Franklin Street, Oakland, California, and the San Francisco Regional Office, 49 Fourth Street, San Francisco, California.

In order to enroll under the provisions of Public Law 346 (G.I. Bill) veterans must present an original or supplemental Certificate of Eligibility

and register within the University's announced registration period and file a study list to obtain full veterans' benefits. 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 received by Dean of Students—Special Services prior to registration. Veterans should apply to their local United States Veterans Administration Office in sufficient time to receive their Certificates of Eligibility or proper authorization prior to registration, or 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.

Information regarding educational benefits available from the State of California may be obtained from the State Department of Veterans Affairs located at 700 Capitol Avenue, Sacramento, California, or by writing to P. O. Box 1559, Sacramento, California.

Veterans who are transfers from any other campus of the University of California without a change of objective and whose training under Public Law 346 has not been interrupted in excess of four months may present only a Veterans Transfer Notice from the campus last attended. If a veteran has been out of training four months or more, or has attended any other institution, he must present a Supplemental Certificate of Eligibility. If the transfer is into a different Veterans Administration region, the veteran should request a transfer of his files to the proper regional office.

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 for any academic year (July 1–June 30) must be filed with the Committee on Undergraduate Scholarships not later than the preceding December 31 by students already in attendance, and not later than March 1 by entering students. Application forms are available in the office of the 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 devote all their time to graduate study and research in the University. Applications for fellowships and graduate scholarships must be filed with the Dean of the Graduate Division not later than February 20, prior to the academic year in which the award is tenable.

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

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

REQUIREMENTS IN THE SEVERAL COLLEGES, SCHOOLS, AND CURRICULA

COLLEGE OF LETTERS AND SCIENCE

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

The upper division, consisting of the third and fourth years, constitutes a period of more advanced study and limited specialization. In order to be admitted to the upper division, a student must 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 architecture, 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 32.)

Military science and tactics, 8 units (men). (See page 33.)

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

Bacteriology 1*, 2*, 4*.

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

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

‡Geography 1.

Geology 1, 2 or 10, 3, 5.

Paleontology 1, 10.

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

Physiology 1, 1L*.

Zoology 1A*, 1B*, 10.

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

* Will be accepted as a laboratory course.

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

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

The student must include among the courses taken in satisfaction of the requirement in natural science at least one course in 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.

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.

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

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

Group 3—Mathematics

Any two of the following courses: C or high school trigonometry, 1, 2, 3A or 11A or 16A, 3B or 11B or 16B, 10, 12.

Group 4—Social Sciences

Anthropology 2A-2B.

Economics 1A-1B.

*Geography 1-2, 5A-5B.

History 4A-4B, 8A-8B, 17A-17B, 19A-19B.

Near Eastern Languages 13A-13B.

Political Science 1, 2.

Psychology 1A and 1B or 33.

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

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

Group 5—Philosophy

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

Group 6—Fine Arts and Literature

Architecture 5A, 5B, 5C, 5D, 6A, 6B, 6C, 6D.
 Art 1A, 1B, 1C, 1D, 10.
 Classics 34, 35, 36, 37A, 37B.
 English 30, 44A, 44B, 46A, 46B, 49.
 French 39A, 39B, 39C.
 German 39A, 39B, 39C, 39D.
 Music 21A, 21B, 27A, 27B.
 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 69). Not more than 6 units of courses numbered in the 300 or 400 series will be accepted toward the A.B. degree. No credit will be allowed toward the A.B. degree for work completed at a junior college after the student has completed 66 units toward the degree.
2. The student must attain as many grade points as there may be units in the credit value of all courses undertaken by him in the University. (Attention is directed to the fact that the School of Education will admit to candidacy for the Certificate of Completion only those students who have maintained a grade-point average of not lower than 1.5 in the work undertaken during the junior and senior years.)
3. At least 54 units of college work must be completed after admission to the upper division.
4. The requirement of American History and Institutions must be completed by all candidates for the bachelor's degree. Students may complete this requirement by passing a single examination in American History and Institutions, for which no unit credit will be assigned; by completing certain courses; by

automatic equivalence granted for courses taken at a collegiate institution in California where it is indicated on the student's official transcript from the institution that the requirement has been satisfied; or by presentation of a certificate of completion of acceptable courses at another collegiate institution (see American History and Institutions, page 33).

5. At least 36 units of work chosen from the upper division courses named in the Letters and Science list (see page 69), with the exceptions noted, must be completed after the student has attained upper division standing.

6. Fulfillment of either A or B:

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

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

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

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

Majors for the A.B. Degree

A major consists of a substantial group of coördinated upper division courses, representing one or more departments of the College. If one year of an acceptable professional curriculum, for example the first year of the 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 35.

Organized Majors and Professional Curricula

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

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

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

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 Advisers: Mr. AIKIN, Mr. LIPSKY.

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.

CHILD DEVELOPMENT

Group Major Adviser: Miss LANDRETH.

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

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

Graduates in the major whose scholastic record meets the requirements for graduate work may continue work in this field toward an M.A. or Ph.D. degree.

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 175A-175B-175C; 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, 135 or 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 41A-41B or 41; Architecture 5C; French 39B; German 39C.

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

COMMUNICATION AND PUBLIC POLICY

Adviser: Mr. BARNHART.

The group major in communication and public policy is designed to contribute to an understanding of the role of mass communication in society. It introduces the student, in general, to the study of the nature, function, content, values, and effects of communication in society and directs his attention specifically to the effects of communication on public policy and opinion. The courses selected cover both these interrelated fields of study—the nature of language,

and the nature of the media of mass communication: radio, press, film, as well as the role played by informative and persuasive communication in modifying the character of public opinion and public institutions.

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

The Major.—Required: 21 units from Speech 117A, 119, 135 (or 137 or 138); Journalism 141; Political Science 114; Psychology 145; Philosophy 108; and 6 units from Anthropology 118A-118B, 120, 160A-160B (or 160); Business Administration 150, 163; Economics 101A-101B; Journalism 190; Philosophy 104; Political Science 109, 112A-112B, 115; Psychology 180; Sociology and Social Institutions 141A-141B.

DRAMATIC LITERATURE

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

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

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

The Major.—Thirty units, of which the comprehensive examination counts for 3 units. Required: English 114A-114B and one of the Shakespeare courses (English 117A-117B, 117E); Dramatic Art 157A-157B, 160A-160B; 6 units selected from English 154, Philosophy 136A-136B-136C, 146, Dramatic Art 130, 135, 140.

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 Comparative Literature.

EAST ASIATIC STUDIES

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

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. Specifications for these regional group majors are found elsewhere in this bulletin.

Preparation for the Major.—Required: History 19A-19B, or an equivalent, and one of the following: Art 1D; Anthropology 2A-2B; Economics 1A-1B; Geography 1-2, 5A-5B; Political Science 1-2.

The Major.—Required: 24 units (which must include courses in five departments) from the following: Anthropology 115, 143; Classics 197; Economics 115, 190A-190B; Geography 125A-125B; History 138A-138B, 192A-192B; Political Science 122, 138; Oriental Languages 142A-142B; 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. F. M. RUSSELL.

Committee in Charge of the Major: Mr. RUSSELL, Mr. CONDLIFFE, Mr. LIPSKY, 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 intergovernment 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 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 beginner's course) in one of the following languages: French, German, Spanish; or 15 units in Russian, Chinese, Japanese, or Portuguese. The language requirement may be met by passing a written reading test prior to the senior year.

Attention is directed to the following courses as useful in the study of certain aspects of this field: Anthropology 160A–160B, 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, and Slavic Languages.

LABOR AND INDUSTRIAL RELATIONS

Group Major Advisers: Mr. KENNEDY, Mr. KERR.

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

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

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

The Major.—Required: 36 units of upper division work as follows: (a) 24 units of background courses: Sociology and Social Institutions 141B, Anthropology 118B, Political Science 112B, Psychology 145, Economics 113, Economics 121A or 121B, Business Administration 190, and one of the following—Philosophy 108, Economics 106A–106B (or 106), Political Science 117 and 151, and Sociology and Social Institutions 132. (b) 12 units of specialized courses: Economics 150 or Business Administration 150; and 9 units selected from Business Administration 151, 152, 153, Economics 152, 185, Mechanical Engineering 143, 146, Political Science 140, 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 year of the College of Letters and Science. In order to do this the student should register as a premedical student on entering the College of Letters and Science. He should then fulfill the requirements for the degree of Associate in Arts, comply with the requirements in American History and Institutions and military science, complete the premedical subjects required for admission to the School of Medicine, and attain full senior standing. Full senior standing for this purpose means the completion of at least 90 units toward the A.B. degree (at least 24 after receipt of the degree of Associate in Arts), including at least 6 units of upper division courses (on the Letters and Science list) taken in the upper division. In order that the student may matriculate into the School of Medicine in his fourth college year, it is essential that he satisfy the lower division requirements by the end of his sophomore year.

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

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

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

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

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

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

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

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

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

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

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

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

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

For further information concerning the School of Medicine, see the ANNOUNCEMENT OF THE SCHOOL OF MEDICINE.

Premedical Curriculum

In order that entrance to the School of Medicine and attainment of the A.B. and M.D. degrees may not be delayed, the student should make sure that

his program is arranged so as to satisfy the requirements for the degree of Associate in Arts by the end of the sophomore year, and all other premedical requirements by the end of the spring semester just preceding the proposed date of entering the School of Medicine. A suggested program follows.

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

Third Year

	<i>Fall Units</i>	<i>Spring Units</i>
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
	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; Biochemistry 101M; Physiology 101M.

PHYSICAL EDUCATION

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

* For regulations concerning Subject A, see page 32; American History and Institutions, page 33.

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

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

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

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

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

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

RECREATION

The insistent demand for recreation in modern life has brought with it the realization of the responsibility of the community to provide not only space and facilities but also trained leadership. The College of Letters and Science, recognizing the need for trained leadership in this field, has established a group major in recreation. This major offers an integrated program of courses drawn from a number of departments and emphasizes a broad cultural background pointed toward an understanding of the needs and aspirations of individuals and groups in a democratic society, the significance of leisure in our civilization, and 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 F. W. Cozens, Professor of Physical Education, as chairman. Students will be assigned advisers according to their special interest in the various fields of study involved; that is, art, dramatic art, music, physical education, etc.

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

Preparation for the Major.—Physiology 1, Zoölogy 10, Psychology 1A, History 4A-4B, Dramatic Art 10A and 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) selected with the approval of the adviser; Physical Education 143A-143B, 144A-144B, Social Welfare 106, 108, and Philosophy 136A; 11 units in the field of specialization according to interest (art, dramatic art, music, physical education). The total group major program comprises 36 units of specified courses together with two summers' field work (or the equivalent) to be taken without credit.

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

REGIONAL GROUP MAJORS

The following group majors are designed to combine studies in the geography, history, government, and ethnography of an important region or country with intensive study of the corresponding foreign language. Their purpose is to

afford a liberal education through an integrated group of courses, 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: History 19A–19B; Oriental Languages 12 or (12A–12B), 13, 17, 14, and one of the following: Anthropology 2A–2B; Art 1D; Economics 1A–1B; Geography 1–2, 5A–5B; Political Science 1–2. The language requirement, including part of the upper division work, may be satisfied by one year's intensive training in the Far Eastern and Russian Language School of University Extension, provided Oriental Languages 13 and 17, or their equivalents, be included in the student's program.

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. 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, Mr. RUSSELL.

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

The Major.—Required: 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; Political Science 123, 124, 127, 129, 185.

Regional Group Major on Germany and Central Europe

Advisers: Mr. KERNER, Mr. SONTAG.

Preparation for the Major.—Required: 16 units of German. (Minor shortages may be made up in the upper division.) Anthropology 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 147. Recommended: Economics 117A–117B; German 112; History 144A–144B, or 145 and 146, or 136A–136B, or 140A–140B.

Regional Group Major on Hispanic America

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

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

The Major.—Required: Spanish 104A–104B or 6 units from Portuguese 21 or 121, 123, or 131; 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; Political Science 148,

149; 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. BROWN, Mr. SCALAPINO, Mr. CARR.

Preparation for the Major.—Required: History 19A–19B; Oriental Languages 9 or (9A–9B), 17, and 39 or (39A–39B); and one of the following: Anthropology 2A–2B; Art 1D; Economics 1A–1B; Geography 1–2, 5A–5B; Political Science 1–2. The language requirement, including part of the upper division work, may be satisfied by one year's intensive training in the Far Eastern and Russian Language School of University Extension, provided Oriental Languages 17 or its equivalent be included in the student's program.

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, 196A–196B; Oriental Languages 132; Political Science 131. 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; Political Science 142; Slavic Languages 131, 132, 152, 134, 138, 133A–133B.

Regional Group Major on Southeast Asia

Advisers: Miss HAAS, Mr. GIFFORD, Mr. SLUITER.

Preparation for the Major.—Required: (emphasis on Indonesia) 8 units of Spanish and 6 units of German or Dutch; or (emphasis on continental Southeast Asia) 16 units of French. In addition, all students, regardless of emphasis, are required to take History 19A–19B and one of the following courses: Anthropology 2A–2B; Economics 1A–1B; Geography 1, 2; Political Science 1, 2. Students interested in Indonesia are also required to take Near Eastern Languages 25A–25B or 25; this requirement may be met in the upper division.

The Major.—Required: (emphasis on Indonesia) Oriental Languages 108, 118, and 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 24 units selected from the following: Art 163 or (161); Classics 197; Economics 115; Geography 125A; History 192A–192B; Oriental Languages 142A–142B; Political Science 132A–132B; Sociology and Social Institutions 166 or (166A). Recommended: 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 57), or they may elect a suitable combination of courses under the general curriculum (see page 51).

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

THE RENAISSANCE

Group Major Adviser: Mr. CLINE.

Study of that period of European civilization 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: French 39A and a reading knowledge of Latin, French, German, Spanish, or Italian.

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

SCULPTURE

Group Major Adviser: Mr. SCHNIER.

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

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

Preparation for the Major.—Architecture 14A-14B (2-2), Art 2A-2B or equivalent at discretion of instructor and 6 units from Art 1A, 1B, 1C, or 1D. The choice of alternates should be made in consonance with upper division courses.

The Major.—Twenty-four units of upper division work including Architecture 113A (2), 114A-114B (2-2), 148A (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), 113B (2), 115 (1), 146 (2), 148B (2); Art courses from Group A (2), Art courses from Group C (2 or 3); Decorative Art 180B (3), 166 (3); Philosophy 136B (3).

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

SOCIAL WELFARE

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

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

- (a) Those who propose to take graduate professional training in social work, by providing for them an integrated program of preprofessional preparation for graduate study;
- (b) Those who look forward to positions in public assistance, social security administration, employment services, recreation, group work, correctional and other branches of the social services for which graduate training in social work is not now always required, by providing for

them an orientation to the social services through a broad background in 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 155, 162, 172, 181; 9 units from Social Welfare 106, Anthropology 118A–118B, Economics 106A–106B (or 106), Economics 150 or Business Administration 150, Economics 180, Psychology 145, Sociology and Social Institutions 148; 9 units from Social Welfare 101A–101B, 108, Architecture 117, Economics 185, Physical Education 140, Public Health 106, Sociology and Social Institutions 144, 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 requirements for admission to the School of Social Welfare, as well as the prerequisites imposed by practically all other university schools of social work.

WILDLIFE CONSERVATION

Group Major Adviser: MR. LEOPOLD.

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

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

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

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; Geology 1; Mathematics C or 3A; Public Health 160A or Economics 2; Zoölogy 1A–1B. Recommended: Agricultural Economics 1; Economics 1A–1B; Geography 1 or 4; Physics 2A–2B, 3A–3B; Physiology 1–1L.

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

LETTERS AND SCIENCE LIST OF COURSES

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

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

Any 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.

- Agricultural Economics 100, 112A, 112B, 113, 116.
 Anatomy. All undergraduate courses.
 Anthropology. All undergraduate courses.
 Architecture 5A, 5B, 5C, 5D, 6A, 6B, 6C, 6D, 14A, 14B, 113A, 113B, 114A, 114B, 117, 120A, 120B 146, 148A, 148B.
 Art. All undergraduate courses.
 Astronomy. All undergraduate courses except 3, 11, and 114.
 Bacteriology. All undergraduate courses.
 Biochemistry. All undergraduate courses.
 Botany. All undergraduate courses.
 Business Administration 1A, 1B, 10, 18, 100, 135, 150.
 Chemistry and Chemical Engineering. All undergraduate courses except 143, 144, 145A, 145B, 146A, 146B, 147, 149, 152.
 City and Regional Planning. All undergraduate courses.
 Classics. All undergraduate courses.
 Decorative Art. All undergraduate courses.
 Dramatic Art. All undergraduate courses except 190, 191, 192, 193.
 Economics. All undergraduate courses.
 Education 108, 110 and not more than 3 units from 101, 102, 105.
 English. All undergraduate courses.
 Entomology 100, 106, 112, 117, 126, 127, 129.
 Forestry 1, 103, 125.
 French. All undergraduate courses except 20.
 Genetics. All undergraduate courses.
 Geography. All undergraduate courses.
 Geological Sciences. All undergraduate courses except 114.
 German. All undergraduate courses.
 Greek. All undergraduate courses.
 History. All undergraduate courses.
 Home Economics 1A, 1B, 6, 10, 14, 101A, 101B, 111, 112A, 112B, 114, 118A, 118B, 132, 134, 142, 152, 160.
 Italian. All undergraduate courses.
 Journalism 120A, 120B, 140, 141, 190.
 Latin. All undergraduate courses.
 Linguistics. All undergraduate courses.
 Mathematics. All undergraduate courses except 107, 142A, 142B, 142C, 142D, 144.
 Medico-Military Science and Tactics 121A, 121B.
 Military Science and Tactics. A total of not more than 8 units of lower division courses. (Upper division courses are not included.)
 Music. All undergraduate courses; a total of not more than 8 units from the following courses will be accepted as Letters and Science credit: 25, 55, 125, 155.
 Naval Science. A total of not more than 8 units of lower division courses and 103M, 104M. (Other upper division courses are not included.)
 Near Eastern Languages. All undergraduate courses.
 Optometry (see Physiological Optics, below).
 Oriental Languages. All undergraduate courses.

- Paleontology. All undergraduate courses.
- Philosophy. All undergraduate courses.
- Physics. All undergraduate courses except 131.
- Physiological Optics 105A, 105B, 106A, 106B.
- Physiology. All undergraduate courses.
- Plant Biochemistry 122, 123.
- Plant Nutrition 115, 117.
- Plant Pathology 121.
- 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, 163A, 163B.
- Sanskrit. All undergraduate courses.
- Scandinavian Languages and Literature. All undergraduate courses.
- Slavic Languages. All undergraduate courses.
- Social Welfare 100, 101A, 101B, 106, 108, 110A, 110B.
- Sociology and Social Institutions. All undergraduate courses.
- Soil Science 110, 111, 112, 113, 114, 115.
- Spanish and Portuguese. All undergraduate courses.
- Speech. All undergraduate courses.
- Zoology. All undergraduate courses except 109 and 145.

HONORS

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

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

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

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

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

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

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

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

Honor students may have (subject to the approval of the instructor con-

cerned) 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 20-27. Entrants will be seriously handicapped in undertaking the lower division courses required in the various curricula of the College of Agriculture unless they have completed the following subjects in high school: algebraic theory, $\frac{1}{2}$ or 1 unit; trigonometry, $\frac{1}{2}$ unit; physics, 1 unit; and chemistry, 1 unit. Students proposing to major in landscape architecture, agricultural engineering, forestry or irrigation science should have in addition 1 unit of geometrical drawing. Failure to take the proper subjects in high school may delay completion of the University course beyond the usual four-year period.

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

Requirements for the Degree of Bachelor of Science

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

1. Satisfy the general University requirements as follows:

- (a) *Subject A.*—The Subject A examination in English composition is required of every undergraduate student at the time of his first registration in the University (see page 32).
- (b) *Military or Naval Science (for male students)* (see page 33).
- (c) *American History and Institutions.*—The student may meet this requirement by the passing of an examination in American History and Institutions or by completion of courses prescribed by the University (see page 33).
- (d) *Residence in the University during the senior year* in the college in which the degree is to be taken.
- (e) *Attain at least as many grade points as units of credit* in courses undertaken at this University.

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

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

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

(a)

CURRICULUM IN AGRICULTURAL ECONOMICS

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

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

CURRICULUM IN AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

(a) Required:

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

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

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

Certain courses are required by the following majors:

Agricultural Education.—Psychology 1A or an equivalent course and Education 160.

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

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

The Curriculum in Agricultural Engineering is offered in the College of Engineering. See page 89.

CURRICULUM IN ANIMAL SCIENCE

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

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

Certain courses are required by the following majors:

Animal Husbandry.—Animal Husbandry 7, 8, 102, 103, and 110. Animal Husbandry 103 satisfies the animal nutrition requirement. Animal Husbandry 101 or Poultry Husbandry 106 are required but may be counted as part of the 16 chemistry units required of all students. Chemistry 1A, 1B, and 8 are also included in these 16 units. Students in this major must spend the last two semesters (before the award of the bachelor's degree) in residence as *bona fide* animal husbandry majors.

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

Poultry Husbandry.—Majors in this subject are required to take Poultry Husbandry 1. Either Poultry Husbandry 106 or Animal Husbandry 101 should be taken as part of the curricular requirements in biochemistry. Poultry Husbandry 104 will satisfy the animal nutrition requirement. Zoölogy 100A and 100C (at Davis) or an equivalent course in embryology are also required.

CURRICULUM IN ENTOMOLOGY AND PARASITOLOGY

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

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

(c) At least 23 units in entomology and parasitology courses in addition to course 49, as indicated in (b), selected with the approval of the major adviser. (Courses 100, 106, 112, and 127 should be included.)

CURRICULUM IN FOOD SCIENCE

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

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

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

Certain courses are required by the following majors:

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

Enology.—Agricultural Engineering 102; Botany 1 and 7; Chemistry 1A, 1B, 5, 8 or 12A, and 101 or 109; Viticulture 1, 105, 116, 117, 124, 125, and 140.

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

* Analytic geometry and calculus, statistics or biometry.

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

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

(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
	<hr/> 36 units

(b) At least 36 units of upper division work distributed among the allied fields of home economics, and chosen with the approval of the major adviser. (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, 140, 141 (or 142), 144, 162, 175; Decorative Art 6A, 6B (or 16A, 16B), 130A; Architecture 110.

Child Development and Family Relationships Major:

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

Clothing and Textiles Major:

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

Family Economics Major:

Home Economics 1A, 1B, 6, 100, 140, 141, 142, 144, 162; 6 to 9 units of upper division economics or business administration selected upon consultation with the major adviser.

Food Chemistry and Technology Major:

Home Economics 1A, 1B, 100, 101A, 101B or 109, 114, 118A, 118B, 141 (or Agricultural Economics 101A or Business Administration 160); Chemistry 1B; Biochemistry 103; Physiology 1L; 4 units of food technology courses. Physics 2A, 2B, 3A, 3B, and Home Economics 12 are recommended electives.

† More detailed information concerning the School of Forestry is contained in the ANNOUNCEMENT OF THE SCHOOL OF FORESTRY, which is available without charge from the College of Agriculture, University of California, Berkeley. Also see statement concerning School of Forestry, page 114.

Nutrition and Dietetics Major:

Home Economics 1A, 1B, 100, 101A, 114, 115, 118A, 118B, 141 (or Agricultural Economics 101A or Business Administration 160); Chemistry 1B; Biochemistry 103; Physiology 1L. 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) The summer practice course, Landscape Architecture 49.

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

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

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

* Decorative Art 6A (or 16A), 6B (or 16B), 7A (or 26A), 7B (or 26B), 160A, 160B, 166, and City and Regional Planning 21A, 21B, 121 may be accepted in partial fulfillment of this requirement with the consent of the student's adviser.

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

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

Certain courses are required by the following majors:

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

Floriculture and Ornamental Horticulture: Chemistry 1A, 1B, 8; Botany 1 and 107; Entomology 144; Irrigation and Soils 126 and 105 or 110A; and Floriculture and Ornamental Horticulture 131A or 131B, 136 and 139. Recommended: Botany 3 or 151; Plant Pathology 140; Agricultural Economics 101A; and Subtropical Horticulture 2 and 110.

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

Plant Pathology: Zoölogy 1A or 10; Soils 100, 110, or 106.

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

Subtropical Horticulture: Chemistry 1A, 1B, 8; Botany 1, 107; Subtropical Horticulture 2. Recommended: Plant Pathology 130; Irrigation and Soils 126 and 105; Entomology 134; Subtropical Horticulture 100, 110.

Truck Crops: Chemistry 1A, 1B, and 8; Botany 1 and 7; Truck Crops 122 and 190.

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

(a) CURRICULUM IN SOIL SCIENCE

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

78 units

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

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

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

CURRICULUM IN PREVETERINARY SCIENCE*

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

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.

AGRICULTURAL ECONOMICS

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

* 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, College of Agriculture, 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 EDUCATION

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Physics 2A-2B	3	3
Botany 1	5	..	Bacteriology 2 .....	..	4
English 1A	3	3	Economics 1A-1B	3	3
Pomology 2	3	..	Poultry Husbandry 1....	3	..
Agricultural Engineering 12 .....	..	2	Zoölogy 1A	4	..
Elective .....	..	3	Chemistry 8 .....	..	3
	<hr/>	<hr/>		<hr/>	<hr/>
	15	15		15	15

ANIMAL SCIENCE

<i>Freshman Year</i>			<i>Sophomore Year</i>		
Military Science	2	2	Military Science	2	2
Chemistry 1A-1B	5	5	Chemistry 8	3	..
Physics 2A-2B	3	3	Bacteriology 2 .....	..	4
English 1A .....	..	3	Economics 1A-1B	3	3
Geology 1	3	..	Zoölogy 1A-1B	4	4
Poultry Husbandry 1....	3	..	Botany 12 .....	..	4
Elective .....	..	3	Physiology 1	3	..
	<hr/>	<hr/>	Physiology 1L	2	..
	16	16		<hr/>	<hr/>
				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 1A-1B	3	3	Chemistry 8 .....	..	3
Geography 2 .....	..	3	Physics 10 .....	..	3
Elective .....	..	3	Bacteriology 2.....	..	4
	<hr/>	<hr/>	Electives	6	..
	15	16		<hr/>	<hr/>
				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
Pomology 2	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	..
	<hr/>	<hr/>	Speech 1B	3	..
	15	16		<hr/>	<hr/>
				18	17

PREFORESTRY

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

‡HOME ECONOMICS

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

IRRIGATION SCIENCE

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

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

† Students who prepare for forestry at 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.

LANDSCAPE ARCHITECTURE

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Botany 12	..	4	Architecture 14A	..	2
Art 2A-2B or Decorative Art 6A-6B	2	2	Architecture 12	1	..
English 1A-1B or Speech 1A-1B	3	3	Architecture 18	1	..
Architecture 1, 2	3	3	Engineering 21	..	3
Economics 1A-1B	3	3	Art 2A-2B or Decorative Art 6A-6B (or 16A- 16B)	2	2
Elective	3	..	Landscape Architecture 1A-1B	3	3
			Landscape Architecture 2	2	..
			History 17A-17B	3	3
			Electives	3	2
	16	17		17	17

PLANT SCIENCE

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

SOIL SCIENCE

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Botany 1	5	..	Chemistry 8, 5	3	3
Chemistry 1A-1B	5	5	English 1A-1B or Speech 1A-1B	3	3
Physics 2A-2B	3	3	Geology 1	3	..
Physics 3A-3B	1	1	Bacteriology 2	..	4
Electives	2	6	Mineralogy 6	4	..
			Mathematics 16A-16B	3	3
	18	17		18	15

PREVETERINARY SCIENCE

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
English 1A	3	..	Chemistry 8	3	..
English 1B or Speech 1A	..	3	Physics 2A-2B	3	3
Chemistry 1A-1B	5	5	Zoölogy 100	4	..
*Zoölogy 1A-1B	4	4	Statistics	..	3
†Electives	3	3	Electives	4	9
	17	17		16	17

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

† See list of restrictive electives on page 78.

Junior and Senior Years

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

Approval of Study Lists

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

Honors

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

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

COLLEGE OF CHEMISTRY

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

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

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

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

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

Honor students in the upper division.—Students who in the first two years of their college work have attained an average of at least two grade points for each unit undertaken will receive honorable mention with junior standing. These students are entitled to register as candidates for honors. After the first semester of the junior year, the Committee on Honors of the College of 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 in the basic chemistry major will not ordinarily be recommended for honors at graduation unless their work includes courses 114H and 180H or other advanced courses approved by the Committee. Subject to the approval of the study-list adviser and of the instructor in the course concerned, students in honors status have the privilege of taking each semester one course not offered by them in satisfaction of subject requirements for the curricula of the College of Chemistry in which they shall be marked "passed" or "not passed." In calculating the grade-point standing, units gained in this way are not counted. Students in the honors group should confer with Professor Orlemann, Chairman of the Committee on Honors of the College of Chemistry, 105 Lewis Hall, with respect to their plans for the last two years of college work. The list of students upon whom honors and highest honors are conferred appears in the annual COMMENCEMENT PROGRAMME.

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

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

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

Sophomore year.—In order to attain full junior standing the program for the second year should include military science (4 units), Mathematics 4A–4B, Physics 4B, and Chemistry 5, a total of 17 units, and at least 10 units chosen from the following list: Physics 4C, Chemistry 12A, 12B, 105 and 110A. It is desirable for students to complete Chemistry 5 in the first semester of the sophomore year. Students preparing for chemical engineering are advised to elect Engineering 22 and 42.

Upper division.—An average grade of at least C in the specific lower division requirements included in (a) to (e) listed above is required for admission to the upper division.

A student in the upper division who fails to maintain at least a C average in the courses in the major in basic chemistry or the curriculum in chemical engineering (below) is subject to dismissal from the College of Chemistry.

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

* Students in the Chemical Engineering curriculum may elect 12C instead of 12B.

† For regulations concerning Subject A, see page 82.

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

Curriculum in Chemical Engineering

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

<i>Junior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Senior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Chemistry 12B (or 12C)	5	..	Chem. Eng. 146B	4	..
Chemistry 110B, 111	3	3	Chemistry 104 (or 105)	3	..
Chem. Eng. 143, 146A	3	4	Mech. Eng. 107	3	..
Chem. Eng. 144 . . . . .	..	3	†Metallurgy 152	2	..
*Engineering 35	3	..	Chem. Eng. 145A . . . . .	..	3
Civil Eng. 108A . . . . .	..	3	Technical electives . . . . .	..	6-8
Mathematics 110 . . . . .	..	..	Business elective	3	..
(or Math. elective) . . . . .	..	4	Non-technical elective . . . . .	..	3
Elect. Eng. 101 (or 100A)	3	..			
	17	17		15	12-14

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

Courses relating to unit operations and to equipment design: Chemical Engineering 145B, 149, 244; Chemistry 114H, 118, 122, 180H; Mechanical Engineering 161, 163, 164, 180; Electrical Engineering 100B, 102, 103A, 105, 106; Metallurgy 108, 110A, 150B; Petroleum Engineering 131A, 131B.

Courses relating to chemical processes: (Inorganic) Chemical Engineering 152; Chemistry 120; Ceramic Engineering 100, 198; (Nuclear) Chemistry 123; Physics 121; (Organic) Chemical Engineering 147; Chemistry 101, 119; Petroleum Engineering 209A; (Biological) Bacteriology 1 or 2, 105; Biochemistry 105A, 105B; Food Technology 112, 113, 114; Forestry 115; Civil Engineering 124, 109B, 147.

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

† May be replaced by Metallurgy 150A or 170A, or Engineering 42 or 40.

Courses in business fields: Economics 10, 152; Engineering 120; Mechanical Engineering 143; Business Administration 1A, 10, 18, 100, 142, 160, 190; Psychology 3.

Acceptable substitutions for Mathematics 110: Mathematics 119A, 130E, 110A with 128; Physics 104A; Engineering Design 102B; or Mathematics 110B with Engineering Design 111.

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. Applicants for admission in September, 1952, must file their applications between October 1, 1951, and March 1, 1952. Freshman students who plan to apply for admission in 1953 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, 1952.

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

Admission to Dental Curricula

All applicants for admission to the dental curricula must have completed at least 60 units of college work with a scholarship average satisfactory to the Admissions Committee (approximately a B average), including the requirements (2)-(5) listed below. 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 who meet the subject requirements must pass a performance test, designed to test manual dexterity. This test must be taken on the San Francisco campus, and is given during the period between the fall and spring semesters, and again either during or soon after the close of the spring semester, depending upon the requirements of selective service. 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 103, Pharmacy 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. 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 32).
 Military science and tactics (men) 8 units
- (2) English or Speech (1A-1B†) 6
- (3) Science 28-32
- (a) Chemistry
 Inorganic (1A-1B) 10 units
 Organic lecture (8) 3
 Organic laboratory (9) or quantitative
 analysis (5) 3
- (b) Physics with laboratory (2A-2B and 3A-3B
 or 4A-4B-4C) 6-8
- (c) Biology, including one full semester of verte-
 brate zoölogy, with laboratory (Zoölogy
 1A-1B) 6-8
- (4) Trigonometry (Mathematics C) 3
 It is suggested that this requirement be completed
 in high school.
- (5) Electives selected as indicated from the following groups: ... 15-20 units
- (a) Group I: 2 year courses selected from Anthro-
 pology (2A-2B), Economics (1A-1B), Eco-
 nomic Geography, Geography (5A-5B),
 History (4A-4B, 8A-8B, 17A-17B),
 Mathematics, Political Science (1, 2), Psy-
 chology (1A-33), Public Health (5A-5B),
 Sociology and Social Institutions (10A-
 10B) 12-14 units
- (b) Group II: Either (a) one year course or year
 sequence in foreign literature in translation
 (French 39A-39B, German 39A-39B-39C),
 a year sequence of any foreign language,
 English (44A-44B, 46A-46B), Music
 (30A-30B or 21A-21B), Philosophy (6A-
 6B, 20A-20B); or (b) any combination of
 two semester courses selected from Archi-
 tecture (5A, 5B, 5C, 14 or 14A-14B), Art
 (1B, 1C, 10), English (30), Music (27A,
 27B, 27C, 27D, 27E), or any two semesters
 of a foreign language in which at least 6
 units have previously been completed or are
 completed concurrently.

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

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 (slightly better than half way between a B and

* The requirement of American History and Institutions is also prerequisite to the bachelor's degree, page 33.

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

a C average), 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. Students planning to enter this curriculum should make this fact known at the time of their first registration. 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, 3 units (algebra, plane geometry, and trigonometry); chemistry, 1 unit; physics, 1 unit; foreign language, 3 or, preferably, 4 units).

(1) *General University Requirements:*

Subject A (examination in English composition).

American History and Institutions (required for the bachelor's degree. The examination in American History and Institutions may be taken in the College of Dentistry, but it is preferable to satisfy the requirement in the pre-dental hygiene program. See page 33).

- | | |
|---|-------------|
| (2) English or speech (1A-1B*) | 6 units |
| (3) Chemistry (1A, 8) | 8 |
| (4) Biology (Zoölogy 1A-1B) | 6-8 |
| (5) <i>Either</i> the Associate in Arts degree from the University of California (or its equivalent), 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 (1A-1B), History (4A-4B, 8A-8B, 17A-17B), Political Science (1, 2), Sociology and Social Institutions (10A-10B), | |
| Group II: Psychology (1A-33), Public Health (5A-5B), Home Economics (1A-1B), | |
| Group III: Philosophy, Art, Music, Literature, Foreign Language. | |
| (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 20. High school subjects prerequisite to college courses required in all engineering curricula include: plane geometry, 1 unit; algebra, 2 units; trigonometry, $\frac{1}{2}$ unit; mechanical drawing, 1 unit; chemistry, 1 unit, or physics, 1 unit (both are desirable). Without this preparation it will be necessary for the student to take equivalent courses in college, thereby barring him from regular courses and delaying his graduation.

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.

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

Advanced standing.—For general information, see page 24.

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. 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 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, 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, otherwise the fee is \$10.

Intercampus transfer.—Students who wish to transfer from other colleges on the campus to the College of Engineering must make application to the Dean of the College of Engineering for such transfer no later than August 15 for the fall semester and January 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 eleven main curricula in agricultural engineering, civil engineering, electrical engineering, engineering physics, industrial engineering, mechanical engineering, metallurgy, mineral exploration, mining engineering, petroleum engineering, and process engineering. Each is a four-year curriculum leading to the Bachelor of Science degree upon completion of the specified number of units, and, in addition, grade points equal to the number of units in the credit value of all courses undertaken.

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

(1)—Continued

	Units
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
<u>Agricultural Engineering:</u>	<u>134</u>	<u>Mechanical Engineering:</u>	<u>131</u>
Mechanics, Thermodynamics, Fluid Mechanics	6	Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials 11	
Irrigation, Soil Science, Agronomy	13	Mechanical Design and Manufacturing Processes	10
Agricultural Machinery and Structures	17	Electrical Circuits and Machinery	5
Optional Subjects	18	Optional Subjects	25
<u>Civil Engineering:</u>	<u>132</u>	<u>Metallurgy:</u>	<u>131</u>
Mechanics, Strength of Materials, Properties of Materials, Specifications	9	Chemistry	8
Hydraulic, Sewerage, Foundation, Structural, and Transportation Engineering	14	Metallurgy	20-24
Optional Subjects	29	Optional Subjects	19-23
<u>Electrical Engineering:</u>	<u>132</u>	<u>Mineral Exploration:</u>	<u>136</u>
Mathematics	4	Chemistry	2
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials	6	Dynamics	3
Electrical Circuits and Machinery	22	Mineralogy, Geology, and Paleontology	34
Optional Subjects	20	Surveying and Map Drawing	6
<u>Engineering Physics:</u>	<u>128</u>	Optional Subjects	11
Chemistry	8	<u>Mining Engineering:</u>	<u>134</u>
Physics	8	Chemistry	2
Mathematics	4	Dynamics	3
Optional Subjects	20	Mineralogy and Geology	18
Foreign Language	8	Mining	10
<u>Industrial Engineering:</u>	<u>134</u>	Metallurgy	5
Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials	10	Analysis of Ores	6
Electrical Circuits and Machinery	5	Optional Subjects	10
Business Administration	15	<u>Petroleum Engineering:</u>	<u>134</u>
Optional Subjects	24	Chemistry	8
		Mechanics, Thermodynamics, Fluid Mechanics	6
		Petroleum Technology and Economics	16
		Optional Subjects	24

	Units		Units
<i>Process Engineering</i> :	134	Thermodynamics, Mechanics, Strength of Materials, Fluid Mechanics	6
Chemistry	19	Applied Electricity and Magnetism .	1
Mathematics	2	Engineering Design of Processes and Equipment	3
Heat Transfer and Unit Operations	17	Optional Subjects	4
Unit Processes	2		

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

(1) Satisfy the general University requirements:

(a) Military science and tactics. See page 33. 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 32.

(c) American History and Institutions. See page 33.

(d) Residence during the senior year. See page 35.

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

(e) Grade points. See page 37.

(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 90-98). A student who engages in part-time employment should plan to spend more than four years by enrolling each semester for fewer than the required number of units. In such cases, course sequences must be carefully planned if delay is to be avoided.

Advisers will aid candidates for military or naval commissions in rearranging their programs of study to include upper division courses in Military or Naval 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 adviser in order to avoid delay caused by the lack of prerequisites.

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

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

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

1. English, speech.
2. Foreign languages.
3. Business administration, economics, political science.

4. Anthropology, history, sociology and social institutions, psychology.
5. Life sciences.
6. Fine arts and philosophy.

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

Students in agricultural, civil, industrial, mechanical, mining, petroleum, and process engineering, metallurgy and mineral exploration 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 in place of the same number of elective units.

PROGRAM OF STUDY IN AGRICULTURAL ENGINEERING

Specific Course Requirements for the B.S. Degree :

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 8.
4. Engineering 1A, 22, 23, 24, 35, 40, 41, 48 (recommended).
5. Civil Engineering 108A, 108F.
6. Electrical Engineering 100A, 100B, 104A, 104B.
7. Mechanical Engineering 105A, 105B, 103, 151 (or Physics 112), 152A (or Chemistry 109).
8. Engineering Design 102B, 106 (or Civil Engineering 107A).
9. Agricultural Engineering 12*, 49, 113, 114, 115, 130.
10. Agricultural Economics 118.
11. Irrigation 120.
12. Soil Science 106.
13. Agronomy 1.

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

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

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

Fourth Year.—The program of the fourth year will be taken on the Davis campus and will consist of Agricultural Engineering 113, 114, 115, 130, Mechanical Engineering 151 (or Physics 112), Mechanical Engineering 152A (or Chemistry 109), Irrigation 120, Soil Science 106, Agronomy 1, free 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.

Free Electives: For selection of free electives, see page 90.

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.

* Entering juniors may substitute approved technical units for this course.

† Recommended technical electives: Agricultural Engineering 199, 106, Bacteriology 1, Botany 1, 107, Chemistry 101, 109, Mathematics 180A–180B, Zoology 10, Dairy Industry 1, Soil Science 110.

7. Civil Engineering 106, 107A, 108A, 108C, 108E, 109A, 111A, 113, 116, 133, 135, 161.

8. Mechanical Engineering 103, 105A.

9. Electrical Engineering 101.

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

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

Third Year.—Engineering Design 102B, Civil Engineering 107A, 108A, 108C, 108E, 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, free electives, 8 units.

Hydraulics:

Third Year: Mechanical Engineering 105A, Civil Engineering 133, 3 units of free electives, 5 units of restricted electives.

Fourth Year: Civil Engineering 151, 9 units of free 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, free electives, 2 units.

Fourth Year: Irrigation 101, 102B, 104, 112, Civil Engineering 151, free electives, 10 units.

Sanitary and Municipal:

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

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

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

Structural:

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

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

Transportation:

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

Fourth Year: Civil Engineering 108H, 108G, 104, 136, 171, Mechanical Engineering 105A, free electives, 6 units.

Free Electives: For selection of free electives, see page 90.

PROGRAM OF STUDY IN ELECTRICAL ENGINEERING

Specific Course Requirements for the B.S. Degree:

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

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

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

Third Year.—Electrical Engineering 110A, 110B, 104A, 104B, 105, 106, Mechanical Engineering 105A, 105B, 107, Engineering Design 102B, Civil Engineering 108A, 108F, English, 3 units.

Fourth Year.—Electrical Engineering 111A, 116A, 132A, 133A, Engineering 113, 120 or Business Administration 100, 3 units of free electives, and 16 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 advisers. These restricted elective units must be of senior level and are to be taken at the University of California. Suggested options are:

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

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

Illumination: Electrical Engineering 140, 141, 142, Physics 108A (or 108B), Physiological Optics 105B, Architecture 108A.

Industrial Electronics and Control: Electrical Engineering 126, 127, 135, and a choice from the following: Electrical Engineering 111B, 118A, 118B, Mathematics 119A, 119B, Mechanical Engineering 143, 164.

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

Power: Electrical Engineering 111B, 118A, 118B, 133B, and a choice from the following: Electrical Engineering 122A, 122B, 126, 127, 135, Mechanical Engineering 118, Engineering 197.

Free Electives: In addition to completing the requirements noted above, 12 units of free electives must be included in the program. See page 90 for selection of electives.

PROGRAM OF STUDY IN ENGINEERING PHYSICS

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 14A, 14B.
2. Chemistry 1A, 1B, 8, 109 (or 5).
3. Physics 4A, 4B, 4C, 105A, 105B, 121, 110A, 110B, 112, 108B.
4. Engineering 22, 23, 120.
5. Mechanical Engineering 103, 164.
6. Civil Engineering 108A.

7. German or French. The first two years of high school work in 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 free electives.

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

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

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

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

Free Electives: For selection of free electives, see page 90.

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, 190.
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, 43, free electives, 3 units.

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, 190, Mathematics 130E, free electives, 6 units.

Free Electives: For selection of free electives, see page 90.

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, free electives, 3 units.
- Second Year.*—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 24, 35, 40, 41, free electives, 3 units.
- Third Year.*—Engineering Design 102B, 106, Mechanical Engineering 103, 105A, 105B, Electrical Engineering 100A, 100B, 104A, 104B, Civil Engineering 108A, 108F, free electives, 6 units.
- Fourth Year.*—Engineering 113, 120, Mechanical Engineering 124A, 124B, 131A, 131B, and 12 units of restricted electives. Senior students will select a sequence of restricted electives in any of one of the options indicated or any other logical sequence of courses approved by the junior and senior advisers. Of the 12 units of restricted electives to be taken at the University of California, 5 units must be senior mechanical engineering courses taken at Berkeley.
- Aeronautics Option:* Mechanical Engineering 121, 162, Mathematics 110A, 110B, Civil Engineering 107G, Engineering Design 170, Mechanical Engineering 123A, 161, 164, 123B.
- Air Conditioning and Refrigeration Option:* Mechanical Engineering 115, 116 or 117, 161, 151, Metallurgy 170A, Mechanical Engineering 154, Chemistry 109, 110.
- Automotive Option:* Mechanical Engineering 123A, 123B, Metallurgy 170A, Mechanical Engineering 151, 161, Engineering Design 170, 172, 173, Chemistry 109.
- Electrical Engineering Option:* Mathematics 110A–110B, Electrical Engineering 106, 133A, and selection of not less than 5 units of senior mechanical engineering courses. (Students should note that 15 units of restricted electives are required for this option.)
- Fluid Mechanics Option:* Mechanical Engineering 161, Mathematics 110A, 110B, Mechanical Engineering 162, 151, Engineering Design 170, Mechanical Engineering 164, Irrigation 102A, 102B.
- Heat Power Option:* Mechanical Engineering 123A, 123B, 118, 161, 117, 151, Petroleum Engineering 117, 119, Metallurgy 170A, Mechanical Engineering 154, Chemistry 109.
- Heat Transfer and Thermodynamics Option:* Mechanical Engineering 151, 161, 152A, 154, Mathematics 110A, 110B, Physics 112, Chemistry 109.
- Hydraulics Option:* Mechanical Engineering 161, 162, 164, Civil Engineering 151, 166, Irrigation 102A, 102B, 104, 112, Engineering 197, Mathematics 110A, 110B.
- Industrial Engineering Option:* Mechanical Engineering 143, 145, 146, Business Administration 100, 142, 150, 190.
- Marine Engineering and Naval Architecture:* Mechanical Engineering 128A, 128B, 126, 123A, 123B, 161, 117, Engineering Design 170.
- Mechanical Design Option:* Engineering Design 102C, 170, 171, 172, 173, Mechanical Engineering 145, Mathematics 110A, 110B, Mechanical Engineering 164, Electrical Engineering 126.
- Nuclear Engineering Option:* Mathematics 110A, 110B, Physics 121, Mechanical Engineering 151, 198 (Nuclear engineering section), Physics 124, 128, 123L, Mechanical Engineering 162, 164, 163, Electrical Engineering 103A, 103B, Metallurgy 150A, Chemistry 123, Engineering Design 171.
- Process Engineering Option:* Mechanical Engineering 152A, 152B, 154, 161, 163, 151, 164, Chemistry 109, Chemical Engineering 144.
- Preparation for Graduate Study Option:* Mathematics 110A, 110B, Me-

chanical Engineering 151, 161, 162, Engineering Design 102C, 170, Mechanical Engineering 154, Mathematics 119A, 119B, Physics 104A, 104B.
Free Electives: For selection of free electives, see page 90.

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, free electives, 3 units.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Metallurgy 2A, Mineralogy 6, Chemistry 110A, Engineering 35.

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, free electives, 6 units, restricted electives, 2 units.

Fourth Year: Metallurgy 110B, 118, 120, Mining 101, 105A, free electives, 3 units, restricted electives, 10 units.

Physical Metallurgy:

Second Year: free electives, 2 units.

Third Year: Civil Engineering 108F, Engineering Design 102B (or Physics 105B), Engineering 41, free electives, 5 units.

Fourth Year: Engineering Design 106 (or Physics 121), Metallurgy 170A, 170B, 172, free electives, 2 units, restricted electives, 12 units.

Free Electives: For selection of free electives, see page 90.

Restricted Electives: Restricted electives are to be selected with the approval of the faculty adviser in such a manner as to form a consistent program contributing to the student's professional development.

PROGRAM OF STUDY IN MINERAL EXPLORATION

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 109.
4. Engineering 1A, 1B, 22, 23, 35.
5. Geology 1, 3, 102A, 102B, 103, 108, 106, 116, 118.
6. Mineralogy 6, 103.
7. Metallurgy 2A.
8. Mining 101, 107A, 107B, 111A, 111B, 113.
9. Electrical Engineering 101.
10. Engineering Design 102B.
11. Civil Engineering 108A.
12. Mechanical Engineering 103.

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

Second Year.—Geology 3, Mathematics 4A, 4B, Mineralogy 6, Engineering 1A, 1B, Physics 4B, 4C, free electives, 3 units.

Third Year.—Metallurgy 2A, Geology 102A, 102B, 103, 106, 108, 118 (summer course), Engineering 35, Mineralogy 103, Mining 101, 113, Electrical Engineering 101, free electives, 3 units.

Fourth Year.—Engineering Design 102B, Geology 116, Mechanical Engineering 103, Chemistry 109, Civil Engineering 108A, Mining 111A, 111B, 107A, 107B, free electives, 7 units.

Free Electives: For selection of free electives, see page 90.

PROGRAM OF STUDY IN MINING ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B.
4. Engineering 1A, 1B, 22, 23, 35.
5. Geology 1, 102A, 102B, 103, 106.
6. Mineralogy 6.
7. Mining 101, 103, 105A, 105B, 107A, 109, 113, 151.
8. Civil Engineering 108A.
9. Electrical Engineering 101.
10. Mechanical Engineering 103, 105A.
11. Metallurgy 2A, 2B, 108, 110A, Ceramics 100.
12. Engineering Design 102B.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 1A, 1B, 22

Second Year.—Geology 1, Mathematics 4A, 4B, Mineralogy 6, Metallurgy 2A, 2B, Engineering 23, 35, Mining 113, Physics 4B, 4C.

Third Year.—Electrical Engineering 101, Geology 102A, 102B, 103, 106, Engineering Design 102B, Mechanical Engineering 103, 105A, Mining 101, 151, free electives, 6 units.

Fourth Year.—Civil Engineering 108A, Metallurgy 108, 110A, Ceramics 100, Mining 103, 105A, 105B, 107A, 109, free electives, 9 units.

Free Electives: For selection of free electives, see page 90.

PROGRAM OF STUDY IN PETROLEUM ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 5, 8.
4. Engineering 1A, 1B, 22, 23, 35.
5. Engineering Design 102B.
6. Mechanical Engineering 103, 105A, 105B.
7. Civil Engineering 108A.
8. Electrical Engineering 101.
9. Petroleum Engineering 117, 119, 121A, 121B, 123A, 123B, 125, 127.

First Year.—Mathematics 3A, 3B, Physics 4A, Chemistry 1A, 1B, Engineering 1A, 1B, 22.

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 23, 35, Chemistry 5, 8, restricted electives, 6 units.

Third Year.—Engineering Design 102B, Mechanical Engineering 103, 105A, Civil Engineering 108A, Electrical Engineering 101, Petroleum Engineering 117, 119, free electives, 6 units, restricted electives, 9 units.

Fourth Year.—Mechanical Engineering 105B, Petroleum Engineering 121A, 121B, 123A, 123B, 125, 127, free electives, 6 units, restricted electives, 9 units.

Restricted electives.—Restricted electives are chosen from a group of courses appropriate for one of the following options:

1. Development option.
2. Production option.

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, 5, 12A, 110A, 110B.
3. Engineering 22, 23, 35, 40, 48, 120.
4. Physics 4A, 4B, 4C.
5. Civil Engineering 108A.
6. Mechanical Engineering 103, 105A, 132A, 132B, 151, 152A, 152B, 154, 180.
7. Electrical Engineering 101, 102.
8. Engineering Design 102B.
9. Chemical Engineering 143.

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

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Chemistry 5, 12A, Engineering 35, 40, free 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, free electives, 6 units.

Fourth Year.—Mechanical Engineering 132A, 132B, 151, 152A, 152B, 154, 180, Engineering 120, restricted electives, three units of which must be design, approved by the adviser, 8 units.

Free Electives: For selection of free electives, see page 90.

Ceramic Engineering

Instruction in ceramic engineering is offered in the Colleges of Engineering, the program at Berkeley emphasizing the exploitation and technology of California raw materials and study of ceramic composition, while that at Los Angeles will be directed toward the problems encountered in ceramic manufacturing. The courses at Berkeley are given under the Division of Mineral Technology. A preliminary survey of the present industry in the State indicates need for a limited number of outstanding undergraduate students together with a considerable demand for graduate instruction and research.

Transportation and Traffic Engineering

Through the Institute of Transportation and Traffic Engineering various offerings are available in the fields of highway, railroad, and airport engineering. The undergraduate work is formally offered in civil engineering under the transportation option, which includes such courses as highway engineering, traffic engineering, and transportation economics. On the graduate level, the Institute offers advanced courses in highway planning, design, and economics, traffic engineering, airport planning and design, highway materials and structures, and airphoto interpretation applied to transportation problems. Available in other departments of the University are courses pertinent to advanced study in the field, such as transportation economics, public administration, and city and regional planning.

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 work 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 curriculum leading to the degree of bachelor of science in pharmacy.

Information concerning this curriculum may be found in the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY, obtained by addressing the Dean, College of Pharmacy, University of California Medical Center, San Francisco 22. In addition, graduate courses leading to the degrees of Master of Science and Doctor of Philosophy in pharmaceutical chemistry are open to qualified students. Graduate studies are under the direction of the Graduate Division of the University. For details regarding these programs, consult the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the ANNOUNCEMENT IN THE BIOLOGICAL SCIENCES which may be obtained from the Dean of the Graduate Division, University of California, Berkeley 4.

The first year of the curriculum may be taken in the College of Pharmacy on the Berkeley or the Los Angeles campus. The remainder of the program (with the exception of Physics 3A and 3B which may be taken in Berkeley) is given on the Medical Center campus in San Francisco. Students who plan to take the first year's work in an institution other than the University of California should particularly note the paragraph below under *Graduation* and should consult the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY in order to make certain that the requirements will be fulfilled.

Students who have completed the requirements of the first year cannot be assured of admission to the second year on the Medical Center campus. When the number of qualified applicants exceeds the available facilities, selection of students will be made on a basis of scholarship as determined from the transcript of record and by examination. A personal interview may be required. Application blanks for admission to the College of Pharmacy on the Medical Center campus may be obtained from the Admissions Office, 103 Pharmacy Building, The University of California Medical Center, San Francisco 22, California. The application period for entrance in the academic year 1951-1952 ended May 1, 1951. Applications for the year 1952-1953 must be filed between October 1, 1951, and April 1, 1952.

Matriculation requirements.—In addition to the requirements for admission to the academic departments of the University (pages 20–28), students planning to apply for admission to the College of Pharmacy must take intermediate algebra, trigonometry, and chemistry in high school. Without this preparation, it will be necessary for the student to take equivalent courses in the University, which may prolong the time necessary to complete the requirements for graduation.

Graduation.—The degree of bachelor of science in pharmacy is granted upon completion of the four-year curriculum and 129 units of credit with at least as many grade points as the total number of units undertaken. Four years of *resident* attendance in a school or college of pharmacy is required before a student is eligible to take the California State Board examination for licentiate in pharmacy. This requirement can be satisfied in the minimum time (four years) by those students who complete the first year of the curriculum in the College of Pharmacy on the Berkeley or the Los Angeles campus of the University. Credit toward the B.S. degree is given for work taken elsewhere in another institution or in another school or college of the University of California; however, the State law requires four years of residence in a school or college of pharmacy, i.e., the student *must have been registered* in a school or college of pharmacy during those four years, in order to qualify for the State Board examination. Students who complete the first year of the curriculum in an institution other than a school or college of pharmacy will be required to complete an additional year of residence on the Medical Center campus to be eligible for the California State Board examination. A certificate of completion will be awarded for this additional year of advanced professional training. (For other requirements, the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY should be consulted.)

CURRICULUM—*Program of First Year*

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

Mr. J. J. Eiler and Mr. D. C. Brodie, advisers to the first-year students, College of Pharmacy, Berkeley, hold office hours in the Life Sciences Building, Berkeley, during the registration period at announced times each semester.

SCHOOL OF ARCHITECTURE

Students in good standing having a minimum of 60 units of University credit will be admitted to the School upon formal application filed with the Secretary of the School. In order to complete the prescribed curriculum in the indicated time, such students should also have completed the prerequisites to the work of the junior year.

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

² Students should have completed two years of algebra and one-half year of trigonometry in high school. If these requirements have not been satisfied equivalent courses (Mathematics C, Mathematics D) must be taken. Students who have satisfied the high school requirements should take one of the following courses: Mathematics 3A or 3B, 11A or 11B, 16A or 16B.

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

New students requesting advanced standing in architectural design or graphic arts courses offered by the School must present a representative exhibit of their work for evaluation by the faculty during registration week.

Advisers: Freshman and sophomore years—Mr. STUMP, Mr. STEINER; junior, senior, and graduate years—Mr. WURSTER, Mr. JEANS, Mr. JORY, Mr. GOODMAN, Mr. DOWNS, and Mr. CZAJA.

	Freshman Year		Sophomore Year	
	Fall Units	Spring Units	Fall Units	Spring Units
Subject A (see page 32) . . . . .	..	..	Military Science	2
American History and In- stitutions (see page 33) . . . . .	..	..	Engineering 18A-18B	3
Military Science	2	2	⁵ Architecture 5A-5B, 6A-6B	3
⁵ Mathematics 3A-3B	3	3	Architecture 3-4	3
⁴ Physics 2A-2B	3	3	Architecture 12	1
Physics 3A-3B	1	1	Architecture 18	1
⁵ Year Course	3	3	⁵ Foreign Language	4
Architecture 1-2	3	3		
Art 2A	2	..		
Engineering 21 . . . . .	..	3		
	17	18		
			16	17

The degree of Bachelor of Arts will be recommended for students of the School who have complied with the rules for candidacy for this degree and have successfully completed the prescribed undergraduate curriculum in architecture (or other training considered equivalent by the Faculty of the School).

In the absence of the Associate in Arts degree, the following will be required for the A.B. degree: 16 units of foreign language; three year courses; 11 units of natural science (see requirements (b), (c), and (d) of the College of Letters and Science, pages 53-54).

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

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

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

² See requirement (b), page 53, College of Letters and Science. (Students entering with only 4 units of high school credit in a foreign language will need to take an additional 4 units.)

⁴ See requirement (d), page 53, College of Letters and Science.

⁵ See requirement (e), page 54, College of Letters and Science.

PRESCRIBED CURRICULUM

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

First Graduate Year

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

Second Graduate Year

Architecture 202	6	..
Electives (to be arranged) . . . . .	..	..
Thesis for the degree of Graduate in Architecture . . . . .	..	..
	<hr/>	<hr/>
	6	..

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

Honors.—Honors with the A.B. degree in architecture may be recommended by the faculty for students graduating from the school, but honors are not recommended except for distinguished work in design and satisfactory work in construction.

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

SCHOOL OF BUSINESS ADMINISTRATION

The School of Business Administration, which replaced the College of Commerce 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. Evi-

dence 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.

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, Mathematics 11A-11B, 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 (Elementary Statistics)	3
Mathematics 2 (Mathematics of Finance and Business)	3
(See page 103 for possible substitutions)	

B. Recommended:

Geography 5A-5B (Economic Geography)	6
(Required of all foreign trade majors)	
Economics 10 (Economic History)	3

II. Basic Courses:

A. Required of all:

American History and Institutions	0
Business Administration 1A-1B (Accounting)	6
Business Administration 18 (Business Law)	3
Business Administration 100 (Economics of Enterprise)	3
Business Administration 101 (Business Fluctuations and Forecasting)	3
Business Administration 105 (Law of Business Organization and Regulation) or 109 (Law of Finance)	3
Business Administration 131 (Corporation Finance)	3
Business Administration 160 (Marketing)	3
Business Administration 150 (Industrial Relations)	3
Business Administration 190 (Production Organization and Management)	3
	30 units

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

Business Administration 135 (Economics of Insurance)	
Business Administration 170A (Inland Transportation)	
Business Administration 180 (Introduction to Real Estate and Urban Land Economics)	
Economics 135 (Money and Credit)	
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, journalism, mathematics, mechanical engineering, political science, psychology, and public administration).

Honors

Honors at graduation.—Students whose work has been of marked excellence receive honors at graduation.

The Degree of Master of Business Administration

Normally, students should not undertake full specialization until after the completion of work for the bachelor's degree. The programs of work for the degree of Master of Business Administration will give opportunity for advanced and specialized training based upon the fundamental curriculum for the degree of Bachelor of Science. The master's degree will require a minimum residence of two full semesters after the receipt of the bachelor's degree.

For detailed information concerning the requirements see the ANNOUNCEMENT OF THE SCHOOL OF BUSINESS ADMINISTRATION, or the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

SCHOOL OF 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 53-55), students must complete certain designated prerequisite courses. Some of these courses, listed below under I. *Prerequisite Courses*, are marked by asterisks indicating their acceptability 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 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.

2. 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.

3. 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 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: Mathematics 12* or Psychology 5 or Economics 2; Physiology 1*; Psychology 1A*.....	9
For students majoring in social criminology:	
Required: Sociology 1*-2*; Political Science 1*-2*; Psychology 3	15
Recommended: Anthropology 1; Architecture 1; Business Administration 1A-1B; Chemistry 1A-1B; Journalism 120A-120B; Physics 2A-2B, 3A-3B; Public Health 5A-5B; Speech 1A-1B, 2A-2B. Students interested in law enforcement are urged to take a year of wrestling and a year of boxing.	
For students majoring in criminalistics:	
Required: Chemistry 1A*-1B*, 5*, 12A-12C; Physics 2A*-2B*, 3A*-3B*; Physiology 1L*	29
Recommended: Botany 1; Geology 1; Mineralogy 6; Zoology 1A-1B, 4.	

II. BASIC COURSES (required of all students)

American History and Institutions	
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 in Criminology)	6

III. MAJORS (Students must complete the courses in one major)

<i>Law Enforcement</i> : Adviser: Mr. Kelley.	
Criminology 107 (Personal Identification)	3
Criminology 111 (Physical Evidence)	2
Criminology 113 (Legal Medicine and Toxicology)	3
Criminology 161 (Psychiatric Aspects of Criminology)	3
Criminology 162 (Therapeutic Theories in Preventive Criminology)	3
Criminology 163 (Interrogation and Detection of Deception)	4
Criminology 171 (Police Planning)	2
Transportation Engineering 190 (Police Traffic Engineering)	2
Electives:	6
Anthropology 150A-150B; Business Administration 121A-121B, 125, 150, 151, 152, 190, 191; Criminology 291A-291B, 293A-	

* Will be accepted in partial fulfillment of requirement (e), College of Letters and Science (see page 54).

	Units
293B; Economics 104, 113, 142, 150, 180; Mathematics 120A-120B; Physiology 104; Political Science 100, 111, 112A-112B, 114, 115, 117, 151, 154, 155, 157A-157B, 160, 162, 172, 181, 183, 184; Psychology 102A-102B, 104, 109, 112, 120, 143, 145, 146A-146B, 148A-148B, 180, 186; Public Health 186; Speech 107A-107B, 110A-110B; 120; Social Welfare 100, 108, 110A-110B; Zoölogy 115; and for seniors who have met the requirements for admission to graduate courses, Political Science 262, 273, 281A-281B; Social Welfare 201, 257A-257B, 262	6
<i>Correctional Work</i> : Adviser: Mr. MacCormick.	
Criminology 161 (Psychiatric Aspects of Criminology)	3
Criminology 162 (Therapeutic Theories in Preventive Criminology)	3
Criminology 163 (Interrogation and Detection of Deception)	4
Criminology 182 (Institutional 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; Business Administration 190; Economics 106A-106B (or 106), 113; Education 160, 164, 181; Home Economics 121, 142; Philosophy 108; Physical Education 131M; Political Science 115, 151, 154, 160, 162, 172, 181, 183; Psychology 33, 112, 141, 145, 165, 185; Public Health 5A-5B, 100A, 106, 110, 135; Sociology and Social Institutions 101A-101B, 130, 160; Social Welfare 106, 108; and for seniors who have met the requirements for admission to graduate courses, Political Science 262, Social Welfare 257A-257B, 262, 264.

Criminalistics: Adviser: Mr. Kirk.

Criminology 107 (Personal Identification)	3
Criminology 111 (Physical Evidence)	2
Criminology 113 (Legal Medicine and Toxicology)	3
Criminology 151 (Microchemical Testing of Physical Evidence)	5
Criminology 155 (Comparative Microscopy)	3
Biochemistry 100A (General Biochemistry)	3
Forestry 114 (Wood Technology)	3
Zoölogy 119A-119B (Optics and Metrology in Biology)	4

Recommended: Anthropology 150A-150B; Biochemistry 104, 107; Botany 108; Criminology 153, 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. The program in preparation for study in the social sciences (for law enforcement and correctional work) will ordinarily be completed in two years. The program in preparation for study in the natural sciences (criminalistics) will normally require three years; the third year of work, however, may be taken after admission to the School of Criminology.

Social Science Program. Adviser: Mr. Kelley.

	<i>First Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
¹ Subject A and American History and Institutions.....	..	..	..
Military Science	2	2	2
² English 1A-1B or Speech 1A-1B.....	3	3	3
³ Foreign Language	4	4	4
Psychology 1A, 3	3	3	3
Political Science 1, 2	3	3	3
	15	15	15
<i>Second Year</i>			
Military Science	2	2	2
³ Foreign Language	4	4	4
Physiology 1	3	..	..
⁴ Psychology 5 or Economics 2 or Mathematics 12.....	..	3	3
Sociology 1, 2	3	3	3
Requirement (d) for degree of Associate in Arts.....	variable	variable	variable
Year Course (See requirement (e) for degree of Associate in Arts)	3	3	3
	15 plus	15 plus	15 plus

Natural Science Program: Adviser: Mr. Kirk.

	<i>First Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
¹ Subject A and American History and Institutions require- ment .....	..	..	..
Military Science	2	2	2
Chemistry 1A-1B	5	5	5
² Speech 1A-1B or English 1A-1B.....	3	3	3
³ Foreign Language	4	4	4
Electives	3	3	3
	17	17	17
<i>Second Year</i>			
Military Science	2	2	2
Chemistry 5 .....	..	3	3
Chemistry 12A-12C	5	3	3
Physiology 1, 1L	5	..	..
Psychology 1A	3	..	..
Electives (Recommended: Zoölogy 4).....	..	8	8
	15	16	16
<i>Third Year</i>			
Physics 2A-2B	3	3	3
Physics 3A-3B	1	1	1
⁴ Mathematics 12 (or Economics 2 or Psychology 5).....	3	or 3	3
Chemistry Elective	3	or 3	3
Electives (may include criminology courses).....	7	7	7
	14	14	14

Honors at Graduation.—Students whose work has been of marked excellence receive honors at graduation.

¹ For regulations concerning Subject A see page 32. For American History and Institutions see page 83.

² 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.

³ 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.

⁴ Mathematics 12 partially fulfills the mathematics choice in requirement (e) for the degree of Associate in Arts (see page 54).

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 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 high, secondary 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

Teacher-Training Curricula

The students must satisfy the following general requirements to complete a teacher-training curriculum leading to a recommendation for a teaching credential.

Scholarship.—The School of Education will admit to candidacy for recommendation only those students who have maintained a grade-point average of not lower than 1.5 in all studies undertaken in the junior and senior years. Candidates 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.

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.

American History.—All persons planning to teach are required to take a course in United States history in college. (See approved list of courses on page 33.)

The Constitution of the United States.—The provisions and principles of the Constitution of the United States. This requirement may be satisfied by completing one of the following courses: History 17A-17B; 172A-172B; Political Science 1; 113; 151.

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

* These requirements may be satisfied by passing the examination in American History and Institutions. See statement on page 33 concerning this requirement.

Hall for information concerning the General Secondary Credential. For information concerning the General Elementary Credential, the student should consult one of the following advisers: Mr. Barnett, Mr. Dumas, Mr. Michaelis, Mr. Russell.

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 six to eight weeks before the opening of 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 to the Dean of the Graduate Division and to the Dean of the School of Education when he files his preliminary application. On the basis of transferred records the Dean of the Graduate Division issues a statement of the student's official status. The student must present this statement when he files his preliminary application for the teaching credential. His study list cannot be approved until this application has been made.

Application for Credential and for Supervised Teaching.—Detailed schedules of procedures may be obtained from 107 Haviland Hall. Applications for Supervised Teaching 320A, 320C, 330A, and 330C must be made in 107 Haviland Hall not later than November 5, 1951, for the spring semester, 1952, and not later than April 7, 1952, for the fall semester, 1952. Enrollment is limited to available facilities.

State Credential Fee.—An application to the State Department of Education for a teaching credential must be accompanied by a fee of \$4. The health certificate fee is \$5 for all applicants.

SPECIFIC REQUIREMENTS

The General Secondary Credential

Requirements.—The candidate for the recommendation for this credential must satisfy the following specific requirements, in addition to the general requirements described on page 109.

1. He must spend two graduate semesters at this University during which he completes a minimum of 24 units of upper division and graduate work with a grade-point average of not lower than 1.75. At least 6 of these units must be in graduate courses, or in upper division courses accepted by the School of Education as substitutes for graduate courses, in the fields of the teaching major or minor, or both. (In order to maintain graduate residence for higher degrees, the student must take at least 4 units in upper division or graduate courses in the semester in which he is enrolled in Education 320C.)

2. He must complete with a scholarship average of at least one grade point the following 22 units in Education (the State Department of Education requires that at least 6 units in education be completed in the graduate year):

Education 110 (Educational Psychology)	3 units
Education 111 (Growth and Development of the Child)	2
Education 170 (Secondary Education)	2
Electives in Education	3-5
Education 320A (Supervised Teaching)	3
Education 320B (Instructional Resources)	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.

(b) Psychology 1A or its equivalent is prerequisite to these courses.

(c) Credit in courses offered in the Department of Education for a teacher's credential may not be obtained by examination.

3. He must complete a teaching major and a teaching minor selected from at least two of the following fields of University studies:**

- (1) Agriculture
- (2) Art
- (3) Business education
- (4) English or speech
- (5) Foreign language (French or German or Italian or Latin or Spanish). Under certain circumstances both a major and a minor in foreign language may be allowed. Consult Mr. J. U. MICHAELIS concerning this or concerning the use of other foreign languages as a major or minor.
- (6) Homemaking
- (7) Librarianship
- (8) Life science
- (9) Mathematics
- (10) Music
- (11) Physical education
- (12) Physical science
- (13) Social studies*

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.

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

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

* There is no "social studies" major for the A.B. degree in the College of Letters and Science. An applicant wishing to offer a teaching major in the "social studies" ordinarily would have as his A.B. major some aspect of the social studies, such as history, economics, political science, etc., or a group major, or a general curriculum major.

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

The Junior College Credential

Requirements.—The candidate for the recommendation for this credential must fulfill the specific requirements listed below, in addition to the general requirements described on pages 109–110.

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, 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, zoology. 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 111).
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 Junior High School Credential and General Elementary Credential

Requirements.—The candidate for the recommendation for either or both of these credentials must satisfy the following specific requirements, in addition to the general requirements described on pages 109–110.

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:

<i>a. For the General Elementary Credential:</i>		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 Management—Education 331	.....	2
Total	.....	28

b. For the General Junior High School Credential:

The student must complete the courses specified above for the general elementary credential and in addition complete the following course:

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

5. *Recommended Sequence of Courses:*

Low junior semester: Education 110 and Education 130. These courses are prerequisite to Education 131, 132, 134, 138, and 330A.

High junior semester: Education 111 and one of the following: Education 131, Education 132, Education 134, Education 138.

Low senior semester: Two of the following: Education 131, Education 132, Education 134, Education 138.

High senior semester: One of the following: Education 131, Education 132, Education 134, Education 138, and Education 330A* which is prerequisite to Education 330C, 330E, and 331.

Graduate semester: Education 330C*, Education 330E, Education 331. (One additional course may be added on consent of the adviser.)

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

- (a) Art
- (b) English and speech
- (c) Foreign language
- (d) Home economics
- (e) Mathematics
- (f) Music
- (g) Natural science
- (h) Physical education
- (i) Social studies
- (j) Psychology, with emphasis on child and clinical psychology
- (k) Group majors chosen from: American civilization, American literature, Far Eastern studies, international relations, physical education, recreation, sociology. In each case the major must be approved by the Director of Supervised Teaching.

* Application for enrollment in Education 330A and 330C must be filed in Room 107, Haviland Hall, not later than November 5, 1951, for the spring semester, 1952, and not later than April 7, 1952, for the fall semester, 1952.

- (1) Regional group majors chosen from; China, Hispanic America, Russia and Eastern Europe, social welfare, wildlife conservation. In each case the major must be approved by the Director of Supervised Teaching.

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.

A minor consists of 12 units, at least 6 of which are in upper division courses.

7. Other courses required for these credentials:

Psychology 1A, General Psychology (3).

Music 27A and/or B, Introduction to Musical Literature (3 or 6).

Decorative Art 16A, Theory of Design and Color (2).

Physical Education 26, Physical Education Activities (Section on Elementary School Skills) ($\frac{1}{2}$).

Music A (or equivalent), Musicianship (2).

History 189A or 189B, History of California (2).

8. The student who desires to qualify for the General Secondary Credential, as well as for the General Elementary Credential and/or the General Junior High School Credential, must include in his program at least three semesters of work beyond the bachelor's degree.

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

(Continued on next page)

* 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.

<i>B.—Continued.</i>	
5. Geology (structural)	Units 3
6. Mathematics (analytic geometry and differential calculus) .	6
7. Physics (general physics with laboratory)	8
8. Statistical methods	3
9. Zoölogy (general biology)	3
10. A choice of English, speech, or philosophy	6
Total	54

C. 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 semesters' residence, the senior year of which must be spent at this University.

2. One hundred twenty-four units of study with 124 grade points, exclusive of the field practice course, Forestry 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.

3. The removal of any deficiencies in the following courses usually taken in high school: mathematics, 3 years, including plane geometry, algebra, and trigonometry.

4. An examination in English composition known as Subject A. Students who fail in this examination are required to take the course in Subject A, which yields no unit credit toward the degree and for which a fee of \$20 is charged.

5. The University requirement of American History and Institutions, either by examination or by passing certain specified courses.

6. The University requirement of 8 units of Military Science and Tactics.

7. The field practice course, Forestry 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 121, 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. There are certain exceptions, however, to this recommendation. Range manage-

ment, for example, is a highly specialized field, for which the student should start to prepare himself in the junior year. The closely allied study of wildlife management (fish and game), may be undertaken best by taking the curriculum in wildlife conservation in the College of Letters and Science, which includes 18 units of forestry in its requirements.

Preforestry

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

Freshman Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Chemistry 1A	5	Chemistry 8	3
Geology 1	3	Zoology 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

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

* Students who prepare for forestry at other institutions which do not offer a one-semester course in botany (equivalent to Botany 1) should take a general botany course. This does not take the place of 4 units of plant physiology with laboratory (Botany 111).

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

The student specializing in range management must include in his 34 units of forestry at Berkeley, Forestry 101, Forestry 102, and Forestry 123. He must, of course, also fulfill the prerequisites for Forestry 123, namely, Forestry 103, Engineering 1A-1B, and Botany 108 and 111.

Field Practice Course

Students majoring in forestry are required to attend, after completing their sophomore work, the summer field practice course (Forestry 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.

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 Division of Agricultural Economics. The program would include the fulfillment of the minimum requirements of the group or division, together with research and a dissertation on a forest problem appropriate to the combined fields of forestry and plant physiology, or forestry and soil science, or forestry and economics, depending on the individual student's choice.

SCHOOL OF 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 must be laid in high school for the study of English, history, mathematics, and natural science. The prelegal student normally will be well advised to defer philosophy and the social studies until he has entered college. If prelegal study is planned effectively, the foundations for a broad culture may be laid in high school and in the first two years of college.

In the second place, *the prelegal student should acquire the intellectual discipline and experience which are to be derived from intensive work for a substantial period of time in a selected field of study.* This work should be carefully planned, and a special competence should be achieved in the selected field. It has often been found that a well-chosen group of courses in economics may be related effectively to later professional study in law. An effective pre-professional training may also be planned with emphasis upon political science, history, business administration, psychology, English, philosophy, or similar fields. College courses in commercial or business law, planned primarily for non-prelegal students, should be included in the prelegal program only when they are prerequisite to other college work.

In the third place, *the prelegal student should begin the cultivation of professional standards of study as early as possible.* Few ideas are more fallacious or harmful than the notion that it is possible to dawdle through high school and college and then make the adjustment to 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. Students who have special problems, however, should not hesitate to seek advice.

Law School Admission Test

The School of Law is now coöperating 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 120.

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.

Applicants are also required (1) to have pursued a program of prelegal study in substantial conformity with the essentials of a satisfactory prelegal education (see page 118), (2) to have achieved a minimum grade-point average of 2.0 (B average) in the work of the last two prelegal years, and (3) to have achieved a satisfactory score on the Law School Admission Test.

Applicants having less than the B average, but at least a 1.5 (C+) average, will 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, 1952, the initial application should be received by the School not later than May 1, 1952. Actual receipt of the initial application by the School is the applicant's responsibility. In no circumstances should the initial application be addressed to another department or office of the University.

2. Applicants are also required to apply for admission to the Graduate Division. This application should be made on forms which will be supplied by the Graduate Division and should be addressed to the Graduate Division, University of California, Berkeley 4, accompanied by a remittance in the sum of \$5 payable to The Regents of the University of California. The remittance of \$5 is not required of veteran applicants who expect to enroll under the provisions of Public Law 346 (the G.I. Bill of Rights) or Public Law 16. This application must also be accompanied by official transcripts of records other than the records of work completed at the University of California, Berkeley. Such transcripts are in addition to those accompanying the initial application to the School of Law. Since applicants cannot be admitted to the School until they have been admitted to graduate standing, the application should be filed at the earliest possible date.

3. For permission to take the Law School Admission Test, applicants will write directly to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey, requesting an application blank and bulletin of information listing places where the test may be taken and the dates on which the test will be given. If the applicant so requests on the test application form, his score will be reported not only to this law school but also to other law schools where he may be applying for admission. He will also receive an individual score report directly from the Educational Testing Service.

Admission to the Graduate Curriculum

The student who 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 teaching law, 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 (Juris Scientiae Doctor, J.S.D.).

Admission to the graduate curriculum may be granted to applicants for the LL.M. degree if they are graduates of approved colleges or universities, if their professional degree has been awarded by a law school approved by the American Bar Association, and if, in the opinion of the Committee on Graduate Study and of the Dean, they give evidence of capacity to complete the requirements for the LL.M. degree.

Admission to the graduate curriculum may be granted to applicants for the J.S.D. degree if they are graduates of approved colleges or universities, if their professional degree has been awarded by a school approved by the

* The procedure herein applies to the class entering in the fall semester of 1952.

American Bar Association, and if, in the opinion of the Committee on Graduate Study and of the Dean, they give evidence of capacity to complete the requirements for the 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 graduation from an American college or university.

SCHOOL OF LIBRARIANSHIP

The School of Librarianship offers a two-year curriculum. To students completing the first year with an average grade of at least C+ (1.5 grade-point average) during each semester, the Bachelor of Library Science degree is awarded. The degree of Master of Library Science is granted to students completing the second-year curriculum with an average grade of at least B.

The A.B. degree of the University of California or its equivalent, a grade-point average of at least 1.5 (C+) in the last two years of academic work, graduate standing, without deficiencies, in the University, and a college year each of two modern languages—preferably French and German—are required for admission. Ability to use the typewriter with accuracy and a fair degree of speed is expected of all students. Applicants are required to take the Profile and Aptitude Tests of the Graduate Record Examination and to have their scores sent to the School in time for evaluation before final action is taken on their applications. Applications for admission to the first-year curriculum will ordinarily not be considered from persons over 35; exceptions may be made for those holding advanced degrees or for those who have had successful library experience. Applicants must submit to the Dean of the School complete transcripts of their academic records so that their qualifications for admission to the School may be determined. New first-year students will not be admitted at the beginning of the spring semester.

Curriculum for the bachelor's degree.—The School's basic curriculum is designed to prepare municipal, county, college, university, school, children's and special librarians. To 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 and are required to take the Profile and Aptitude tests 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 cannot qualify for it.

Candidates for the master's degree are subject to all general University regulations governing that degree (see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION).

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 62). 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. The date of the examination will be announced later.

Applications for admission to the School of Medicine should be filed with the Admissions Office, 103 Pharmacy Building, The University of California Medical Center, San Francisco 22, California. Applications for the September, 1952, first-year class must be filed between October 1, 1951, and November 30, 1951, but no application blanks will be issued by the Admissions Office after November 15, 1951. 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. The test must be taken in the fall of 1951, unless it has been taken before that time. Ordinarily, no applicant may substitute his grade in a second or third test because it is higher than his first grade. However, the test should be repeated if, at the time of application, more than two years have elapsed since the last test. Students must complete all premedical requirements by the end of the spring semester preceding admission to the School of Medicine. Candidates from other colleges will be permitted, however, to complete the course Zoölogy 4 in the first summer session. Attention is called to this new regulation concerning the completion of requirements.

The American History and Institutions requirement for the bachelor's degree must be met prior to admission to the School of Medicine. It is impossible to satisfy the requirement during the first year of the School of Medicine.

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 Admissions Office.
2. Upon completion of evaluation of the records by the Admissions Office, 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.

With exception of the five out-of-State applicants mentioned below, all of those selected for the class will be California applicants. To be considered a California applicant, a student must (a) have completed *sixty units* or more of premedical work in an accredited college or university in this State, or (b) must be a *legal resident* of the State of California who lived in the State *prior* to the beginning of his premedical work and who left the State *temporarily* for completion of all or part of his premedical work.

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

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

(b) Ordinarily not more than one applicant will be accepted from outside continental United States, Alaska, and Hawaii. This applicant must have completed at least one year at the University of California or at an equivalent institution in the United States, one semester of which must have been completed previous to February 15 of the year of admission.

An accepted applicant who finds it impossible to begin his work in the School of Medicine in September, 1952, 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.

The State law governing the practice of medicine in California prescribes that every person, before practicing medicine or surgery, must produce satisfactory testimonials of good moral character and a diploma issued by some legally chartered medical school, the requirements of which shall have been, at the time of granting such diploma, in no particular less than those prescribed by the laws of the State, and which shall have received the approval of the Board of Medical Examiners that year. The requirements for matriculation in the University of California School of Medicine cover also the requirements of the Association of American Medical Colleges, provided that the high school program includes physics and chemistry.

All of the above is subject to change by such emergencies as may arise.

For further information see the annual ANNOUNCEMENT OF THE SCHOOL OF MEDICINE, and the leaflet for the 1952 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.

MEDICAL TECHNOLOGY

The University of California School of Medicine offers a training program to students preparing to be medical technicians.

Admission.—Applicants must satisfy either 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 103 and 104, 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.—Fees are as follows:

	FIRST SEMESTER		SECOND AND THIRD SEMESTERS	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee	\$35	\$35	Same as first semester	

For further information, write to the Supervisor, Curriculum in Medical Technology, University of California School of Medicine, 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	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
Tuition Fee	200.00*	200.00***
	\$235.00	\$235.00	\$ 35.00	\$ 35.00

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.

* The \$200 tuition fee covers the course of eight months and is payable only once.

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 from the School of Medicine with a major 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.

Fees. Fees for the first and second semesters are as follows (there being no fees for the third semester):

	FIRST SEMESTER		SECOND SEMESTER	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
Tuition Fee	75.00	150.00	75.00	150.00
	<u>\$110.00</u>	<u>\$185.00</u>	<u>\$110.00</u>	<u>\$185.00</u>

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. This course extends through a full year.

Admission: In the selection of students, preference is given

first, to graduate nurses and university graduates who have taken science to the extent of at least Physics 2A-2B and 3A-3B and Anatomy 102; second, to students who have had university training in the above subjects but who have not graduated;

third, to students who have graduated from high school. Students with no more than high school graduation are seldom accepted unless better qualified students are not available.

Women students are preferred, but men are not excluded.

Since personality, as well as scholarship, is important in dealing with sick people, an interview with the Medical Director precedes acceptance. If the applicant lives at a great distance, special arrangements for an interview can be made.

The course starts annually on September 1. The number of students is limited to six per year.

Curriculum: The student technicians are given practical training in all parts of the Division of Radiology. In addition they are given instruction by seminars and lectures at weekly intervals throughout part of the year. The program is so designed that the student at the completion of her course will have a technicians knowledge of all the procedures used in making X-ray examinations; understand thoroughly dark room methods; understand thoroughly services required of a technician in a fluoroscopic room; be able to give technical assistance to a radiologist giving radiation therapy; and understand the reception and handling of patients, the filing of films and other incidentals necessary to the operating of an X-ray office or department.

Certificate: A certificate of completion of the curriculum is given at the end of the course.

Fees: The student must supply his own maintenance and uniforms.

Fees are as follows:

	FIRST SEMESTER		SECOND AND THIRD SEMESTERS	
	Residents of California	Nonresidents of California	Residents of California	Nonresidents of California
Incidental Fee	\$35.00	\$35.00	Same as first semester	

For further information concerning the program, write to the Medical Director, X-ray Technicians Course, 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.

The nurse of today is expected to be able to assist with the care of the sick, the prevention of disease, and the maintenance of health. Through class work, conferences, and supervised practice the student is given an opportunity to learn the care of patients in the hospital and in the home, the measures which are used to teach health and prevent disease, and the community resources for the handling of the health problems of its citizens.

Requirements for Admission

The completion of the requirements for the degree of Associate in Arts as prescribed by the College of Letters and Science or the College of Applied Arts is required for admission to the School of Nursing. The work taken to satisfy this requirement must include the specified courses outlined on page 53 of this bulletin.

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

Students completing the curriculum in the School of Nursing must take the State Board Examination in order to secure their licenses to practice in this State. An applicant for this examination must either be a citizen of the United States or have declared his intention to become a citizen of the United States.

The following program, if satisfactorily completed, will meet the requirements for the degree of Associate in Arts in the College of Letters and Science at the end of the fourth semester.

<i>First Year</i>			<i>Second Year</i>		
	<i>Fall Units</i>	<i>Spring Units</i>		<i>Fall Units</i>	<i>Spring Units</i>
Subject A .....		..	Physiology 1 and 1L.....	5	..
Chemistry 1A	5	..	Anatomy 102 .....	..	3
Bacteriology 2 .....	..	4	Psychology 1A	3	..
English or Speech (year course)	3	3	Year course	3	3
Year course	3	3	‡Electives	4	9
‡Electives	4	5			
	15	15		15	15

The American History and Institutions examination, or courses in satisfaction of the requirement, should be completed. See page 33.

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

CURRICULA FOR GRADUATE NURSES

Bachelor of Science Degree

This curriculum leads to the Bachelor of Science degree and to the Certificate of Completion in either public health nursing or nursing education. The purpose is to prepare nurses for staff positions in public health nursing agencies or clinical teaching and departmental supervision in schools of nursing.

Requirements for Admission

The courses comprising the curricula for graduate nurses are given in the College of Letters and Science and in the School of Nursing. Graduates of approved nursing schools who have met the matriculation requirements of the University may obtain the Bachelor of Science degree on completion of the following:

1. The requirements for the degree of Associate in Arts in the College of Letters and Science at Berkeley or at Los Angeles, or for the degree of Associate in Arts in the College of Applied Arts, Los Angeles, including such special requirements as may be prescribed by the Faculty of the School of Nursing

2. At least 60 units of such additional work as may be prescribed by the Faculty of the School of Nursing. Not more than 30 units of work completed in a school of nursing other than that of the University of California will be accepted in partial satisfaction of this requirement.

In cooperation with the United States Public Health Service and the Langley Porter Clinic, a major in nursing education with specialization in advanced psychiatric nursing has been established under the provisions of the National Mental Health Act. The requirements for admission to the psychiatric program are the completion of the Associate in Arts degree, as indicated below, with the addition of Psychology 33, 3 units, and Sociology and Social Institutions 1A-1B, 6 units. Psychiatric experience is advantageous.

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

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

**PROGRAM SATISFYING REQUIREMENTS FOR THE
DEGREE OF ASSOCIATE IN ARTS**
(For graduates of approved schools of nursing)

	<i>First Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Subject A (English Composition)
Foreign language		4	4
*Natural science		5	3
English or speech (year course)		3	3
Year course		3	3
Electives	2
		-----	-----
		15	15
<i>†Second Year</i>			
Psychology 1A		3	..
Natural science		4	..
Year course		3	3
†Electives		5	12
		-----	-----
		15	15

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

<i>‡Third Year</i>					
	<i>Mini- mum Units</i>	<i>Maxi- mum Units</i>		<i>Mini- mum Units</i>	<i>Maxi- mum Units</i>
15 units selected from:			15 units selected from:		
Medical nursing	2	3	Nutrition	3	6
Surgical nursing	2	3	Social aspects of nursing ..	2	3
Obstetrical nursing	2	3	History of nursing	2	3
Pediatric nursing	2	3	Preventive medicine	3	3
Communicable disease			Public health nursing	3	3
nursing	1	2	Child hygiene	2	3
Psychiatric nursing	1	2	Child psychology	2	3
Pharmacology	1	2	Principles of health		
Principles and practice of			teaching	1	3
nursing	2	3	Professional adjustments		
Pathology	1	2	of the graduate nurse ..	1	3

Fourth Year

General Requirements

- Education (including Education 110)..... 5 units
- Socioeconomics (including Social Welfare 100)..... 5 units
- ‡American History and Institutions..... courses or examination

Major in Nursing Education

Major in Public Health Nursing

	<i>Units</i>
General Requirements	10
Nursing 432	2
Nursing 434	3
†Electives	15

	<i>Units</i>
General Requirements	10
Public Health 145	3
Public Health 100A	3
Education 151 or 152.....	2
Nursing 416	3
Nursing 418-419	6
Electives	3

30

30

*, †, ‡, §, ||, ¶. See next page.

The degree of Bachelor of Science will be conferred upon completion of the program set forth above. An additional semester of field work (Nursing 420 or Nursing 433) must precede the granting of the Certificate in Public Health Nursing or the Certificate in Nursing Education.

For more detailed information regarding this program, students should refer to the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

Master of Science Degree

The School of Nursing offers a curriculum leading to the Master of Science degree in the fields of nursing education and public health nursing. This aims to prepare nurses for administrative, supervisory, and teaching positions 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 Department of Nursing to be eligible to complete the program for a higher degree. She should have had at least two years of successful experience in clinical nursing practice, clinical instruction, or experience in a community health agency.

The candidate will follow Plan 1 or 2 as outlined by the Graduate Division, Northern Section. Twelve units of work will be selected from courses numbered in the 200 series in nursing and twelve from upper division and graduate courses in fields related to the student's major program.

Fees and Expenses

While the student is in residence at Berkeley, she will be required to meet all the expenses outlined in earlier pages of this bulletin.

For expenses of students at the University of California Medical Center in San Francisco, see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

For further information address the Dean of the School of Nursing, The University of California Medical Center, San Francisco 22, California, or the Chairman of the Department of Nursing, Life Sciences Building, University of California, Berkeley 4, California.

SCHOOL OF OPTOMETRY

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

Admission to the School of Optometry is limited. Candidates for admission to the first-year (junior) class are accepted primarily on the basis of scholarship, particular emphasis being placed on the required subjects. In addition, each applicant may be required to take a professional aptitude test.

At least 35 of the 50 applicants admitted to the first-year (junior) class must

* Physiology 1, 1L (5), and Anthropology 1 (4) recommended.

† For a complete statement of the requirements for the degree of Associate in Arts in the College of Letters and Science, see pages 53-55.

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

§ Requirements of this year can be met wholly or in part through courses taken in another school of nursing. Courses which do not meet the minimum credit are not accepted in meeting these requirements.

¶ For list of courses accepted in fulfillment of the requirement of American History and Institutions, or for other means of satisfying the requirement, see page 83.

‡ Students specializing in psychiatric nursing should include in their program, in lieu of electives: Anthropology 118A, Education 153, Psychology 111 and 168, and Sociology 148.

be California applicants. Up to as many as fifteen applicants will be accepted who are not legal residents of California. Ordinarily these nonresidents will be selected from states west of the Mississippi, or from foreign countries, not having optometry schools.

To be considered a California applicant, a student must be a legal resident of the State of California and

- (a) have completed 45 or more units of the preoptometry work in a college or university in the State of California, or
- (b) have resided in the State prior to the beginning of his preoptometry work and left the State temporarily for the completion of all or part of the preoptometry work.

Applications for admission for the fall semester of any year must be filed with the 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 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 zoology*.

An accepted applicant who finds it impossible to begin his work in the School of Optometry in September, 1951, 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</i>	<i>Spring</i>	<i>Sophomore Year</i>	<i>Fall</i>	<i>Spring</i>
Subject A (see page 32)	-	-	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 7	-	3
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	Psychology 1A-33 (or 1A-1B).....	3	3
§Elective	1 or 3	0 or 2	*Zoology 1A	4	-
			§Elective	2 or 4	0 or 2
	15 units 15 units			15 units 15 units	

* While Zoology 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:

Zoology 1A-Zoology 1B

Zoology 1A-Comparative Anatomy

Zoology 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 53.

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.

REQUIRED CURRICULUM IN OPTOMETRY					
Junior Year	Fall		Spring		Senior Year
	Units	Units	Units	Units	Fall Spring Units Units
American History and Institutions (see page 33)	—	—			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
†† Elective	1	3			105A-105B 3 3
					Physiological Optics
					106A-106B 1 1
					†† Elective — 3
	—	—			— —
	16	15			16 17
Graduate Year					
			Fall	Spring	
			Units	Units	
Optometry 409A-409B			6	6	
Optometry 412A-412B			2	2	
Optometry 414A-414B			1	1	
Optometry 416A-416B			1	1	
Optometry 417			—	1	
Physiological Optics 203			2	—	
Physiological Optics 205			—	1	
Elective			3	3	
			—	—	
			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.

†† Students must meet the requirements of the School of Optometry.

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

(1) *General Requirements.*

Subject A. (See page 32.)

Military Science and Tactics (men). (See page 33.)

(2) *Preparation for the Major.*

A: Basic subjects required for all public health majors:

Public Health 5A-5B.

Bacteriology 2 or 7.¹

Chemistry 1A.

Physiology 1-1L² or Zoölogy 1A or 10.³

Psychology 1A.

At least 6 units (Sanitarians are required to complete 3 units) from:

English 1A, 1B.

Speech 1A, 1B.

At least 6 units from:

Anthropology 2A, 2B.

Economics 1A, 1B.

Geography 1, 2.

Mathematics 3A, 3B.

Sociology and Social Institutions 10A, 10B.

B: Additional requirements for specific fields of emphasis within the public health major:

Laboratory (Public Health and Clinical)

Chemistry 1B, 5, 8.

General Physics (if physics not taken in high school).

Zoölogy 1A.

Preadministration

Business Administration 1A-1B.

Political Science 1.

Public Health Education

Public Health 35.

Decorative Art 6A (or 16A).

Physical Education Activities (2 units).

Psychology 33.

Public Health Sanitation

Chemistry 1B, 8.

City and Regional Planning 21A-21B.

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

Economics 1A.

Recommended electives: Chemistry 5, 9, Engineering 8, 21, and 22. Mathematics C must be taken as an elective if trigonometry was not completed in high school.

Biostatistics

Mathematics 3A-3B.

PROGRAM IN THE SCHOOL OF PUBLIC HEALTH—UNDERGRADUATE CURRICULA

Candidates for the degree of Bachelor of Science must have completed at least 120 units of college work, not less than 24 units of which shall have been completed as a major student in the School of Public Health. The student must have obtained at least as many grade points as there are units in the total credit value of all courses undertaken by him in the University of California. He must have satisfied the requirement of American History and Institutions. (See page 33.)

¹ Bacteriology 7 is not acceptable for Laboratory and Sanitation majors.² Physiology 1-1L is not acceptable for Laboratory majors.³ Zoölogy 10 is not acceptable for Health Education, Laboratory, or Sanitation majors.

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

Public Health 100A, 147A (or under special circumstances, 145), 147B, 150A-150B, 162.

Bacteriology 101.

Biochemistry 102.

Entomology 117.

Zoology 140.

Electives and general University requirements.⁴

For those emphasizing clinical laboratory, Physics 2A-2B, 3A-3B, and Zoology 119A-119B are recommended. For those emphasizing public health laboratory, recommended electives are other public health courses, Entomology 126, Food Technology 113, 115B.

(2) Preadministration

Required for all preadministration majors:

Public Health 100A, 100B, 106, 110, 134, 162, 187.

Anthropology, 3 units.

Economics 130A, 185.

Political Science 158 or 182.

Psychology 145.

Plus one of these three groups:

A. Required for those interested in public health administration:

Public Health 147A, 147B, 170.

Political Science 183 and one of the following:

Political Science 155, 162, 172.

Electives and general University requirements.¹

B. Required for those interested in hospital management:

Public Health 145.

Business Administration 151, 110.

Electives and general University requirements.¹

C. Required for those interested in medical care administration:

Public Health 145, 170.

Political Science 155, 183.

Electives and general University requirements.¹

(3) Public Health Education

Public Health 100A, 106, 110, 125, 131, 133, 134, 135, 136, 145, 162.

Anthropology 118A, 118B.

Education 102, 106 or 107, 181.

Home Economics 111 or 137.

Psychology 145, and one additional upper division psychology course.

Electives and general University requirements.¹

(4) Public Health Sanitation

Public Health 100A, 110, 113A-113B, 114, 131, 147A, 147B, 153, 162, 170.

Entomology 126.

Twelve units from either (A) or (B):

A. For students interested in the biological science aspects:

Public Health 112, 186.

Civil Engineering 123, 124.

Food Technology 112.

Political Science 185.

Zoology 109.

¹ The American History and Institutions requirement must be satisfied before graduation. (See page 93.)

⁴ The American History and Institutions requirement must be satisfied before graduation. (See page 93.)

B. For students interested in the physical science aspects:

Civil Engineering 108A,² 123, 124.

Engineering 23, 35.

Engineering Design 102B.

Mathematics 4A, 4B.

Mechanical Engineering 103,² 105A,² 105B,² or Civil Engineering 110.²Electives and general University requirements.¹

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 (Sanitation) upon the completion of Bacteriology 2. It is recommended that Public Health 100A and 110 be completed by the end of the third year. Students majoring in public health sanitation who plan to obtain the 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.

(5) *Biostatistics*

Public Health 100A, 110, 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.

At least 10 units from any courses in:

Economics. Sociology.

Mathematics. Zoölogy.

Psychology.

Electives and general University requirements.¹**Honors**

Students whose work has been of marked excellence may receive Honors or Highest Honors at graduation.

Graduate Curricula

DEGREE OF MASTER OF PUBLIC HEALTH

Admission.—To be admitted to the curriculum leading to the degree of Master of Public Health, the student must have graduated from an approved medical school, 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, biology, and the social sciences; he must be qualified in some professional capacity for postgraduate education in public health; and should 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 field 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

¹ The American History and Institutions requirement must be satisfied before graduation. (See page 33.)

² Mathematics 3A-3B is included in the prerequisite for this course.

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.). Some students prefer to enroll for only one academic year, two semesters of work, and to take junior professional positions at the conclusion of their first year of work. No credential is given at the end of the first year, but those who have satisfactorily completed the first year are eligible to take the official State of California examination for Registered Social Worker and to become junior members in the American Association of Social Workers.

Requirements for admission.—Admission to the School of Social Welfare is limited to students who:

- (A) Hold the degree of Bachelor of Arts or Bachelor of Science from the University of California or an equivalent degree from a college or university of recognized standing, and who have established their eligibility for admission to graduate standing at the University of California.

- (B) Are not over 35 years of age; however, for persons who, through experience in the field, have demonstrated good capacity for social work, this requirement may be waived.
- (C) Are in good health, as indicated by a thorough medical and physical examination conducted by the University of California Student Health Service at time of registration.
- (D) Comply with either of the following requirements:
- a. Completion of the group major in social welfare offered at the University of California, Berkeley, or of an equivalent group major.
 - b. Completion of the University of California courses listed below, or their equivalents, or presentation of satisfactory evidence (ordinarily by writing noncredit qualifying examinations) that they have adequate knowledge of the subject matter of such courses:
 1. Economics 1A-1B (Elements of Economics).
 2. Psychology 1A (General Psychology).
 3. Economics 150 (Labor Economics) or some other course in social economics, such as Economics 152 (Labor Economics), Economics 180 (The Problems of Poverty), or Economics 185 (Social Insurance).
 4. Psychology 160 (Mental Deficiency) or some other course in clinical or abnormal psychology.
 5. Economics 2 (Elementary Statistics), Psychology 5 (Introduction to Psychological Measurements), or some other course in elementary statistical methods.

This requirement may be fulfilled, with respect to items 3 and 4, by applicants submitting a plan satisfactory to the School whereby the requirement will be fully met within one calendar year after the date on which they enroll; and in the case of students who have completed one academic year of study at a graduate school of social work the requirement may be modified at the discretion of the School; but in no case will students be formally advanced to candidacy for the master's degree until the full requirement, or any modified requirement for students transferring from other graduate schools of social work, has been satisfied.

- (E) Satisfy the Admissions Committee of the School that they are also suitable in other respects for the profession of social work.

Undergraduate preparation.—The group major in social welfare, described on page 67, is strongly recommended for students preparing for admission to the School of Social Welfare. Alternatively, they may take undergraduate majors in economics, psychology, political science, or sociology, or a group major in social science, these majors to include the prerequisite courses listed above. Students looking toward social work training should consult the School of Social Welfare as early as possible in their college careers for advice.

Requirements for the master's degree.—The degree of Master of Social Welfare (M.S.W.) will be granted to students who:

- (a) Have been admitted to the School of Social Welfare in accordance with the regulations of the Academic Senate.
- (b) Have spent two years of graduate study in social welfare, including at least one year in residence at the University of California (Berkeley).
- (c) Have completed a program of study approved by the School, according to one of the following plans:

Plan 1. There are required at least 40 units and in addition a thesis. The courses must be professional, graduate, and upper division courses. They must include, as a minimum, 20 units of *graduate* and *upper division* courses completed with an average grade not lower than B.

Plan 2. There are required at least 44 units and in addition a comprehensive final examination in the field of social welfare. The courses must be professional, graduate, and upper division courses. They must include, as a minimum, 24 units of *graduate and upper division* courses completed with an average grade not lower than B.

- (d) Students who have completed courses which are part of the social welfare curriculum in an accredited school of social welfare elsewhere than at the University of California, *may* be granted credit for such courses to the value of not more than 24 units. Not more than 4 such units will be accepted, however, toward satisfaction of the required 20 or 24 units in upper division and graduate courses. Such students must have maintained an average grade not lower than B in *all* those upper division and graduate courses undertaken in graduate residence at the University of California.

Dates for filing applications.—Admission to the School of Social Welfare is possible only in the fall of each year. Applications should be submitted as early as possible between the first day of January and the fifteenth day of May of the year in which the student wishes to begin his work. Application forms may be obtained at the School of Social Welfare, 2400 Allston Way, Berkeley 4, California.

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

CURRICULUM IN HOSPITAL DIETETICS

The Department of Home Economics of the College of Agriculture, with the approval of the Graduate Council, is authorized to issue a Certificate in Hospital Dietetics to students who complete with an average grade of at least B the curriculum described below, and an internship of 4 months approved by the curriculum adviser.

Requirements for admission.—Applicants must hold a bachelor's degree with a major in the field of food and nutrition, including quantitative techniques, from a university or college of recognized standing, must present satisfactory certificates of health, and, in addition, must have the approval of the departmental committee concerned with the training in hospital dietetics.

Course of study.—The curriculum extends over a period of at least one calendar year, including one semester of residence at the University of California Hospital in San Francisco and one semester of residence at the University of California in Berkeley. During the residence in San Francisco the student must complete 8 units of instruction and supervised practice in hospital dietetics, and during the residence in Berkeley 10 to 15 units of work, partly in graduate courses, and ordinarily including courses in human nutrition or diet in disease, laboratory methods in metabolism or advanced biochemistry, marketing or business administration, and hospital dietetics.

All inquiries should be addressed to the Chairman of the Department of Home Economics, University of California, Berkeley 4.

INSTITUTE OF INDUSTRIAL RELATIONS

The Institute of Industrial Relations, authorized by the Legislature of the State of California in 1945, began operation in 1946. It is concerned with three principal types of activity: (1) the prosecution of an integrated interdisciplinary research program currently directed primarily toward the study of wage determination, collective bargaining, unionism, the structure and operation of labor markets, and the problems of an aging population. Staff members of the Institute are drawn from several social science disciplines covering economics, political science, sociology, and psychology, (2) the conduct, in cooperation with University Extension, of a community relations program serving management, unions, and other groups interested in industrial relations and consisting of series of public lectures, conferences, institutes of varying duration, and evening courses, (3) the consultation with teaching departments about the development and coordination of a well-rounded but essentially nonvocational curriculum in the field of management-labor relations, broadly viewed. The Institute has no curriculum and offers no courses of its own. A pamphlet describing the industrial relations curriculum on the Berkeley campus and the activities of the Institute of Industrial Relations may be obtained by addressing a request to the Institute of Industrial Relations, Room 201, California Hall, University of California, Berkeley 4. Mr. Clark Kerr is the Director of the Institute.

INSTITUTE OF SLAVIC STUDIES

The Institute of Slavic Studies was established in 1948, with the assistance of the Rockefeller Foundation, for the purpose of encouraging graduate teaching and research on the Slavic nations, both Russian and non-Russian. The Institute is University-wide in scope and functions on the several campuses. Its organization consists of a Director, an Advisory Board, an Academic Staff which includes members of the faculty giving instruction in Slavic studies in the various departments, and additional members appointed on the budget of the Institute. Particular attention is given to the development of scholars in the social sciences and the humanities. Courses in the fields of Slavic studies in the departments of Anthropology, Economics, Geography, History, Political Science, and Slavic Languages and Literature may be selected for inclusion in the 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 311, Charles Franklin Doe Library.

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 (I, emphasis Agriculture; II, offered jointly with California state colleges; III, professional emphasis), Master of Engineering, Master of Forestry, Master of Journalism, Bachelor of Library Science, Master of Library Science, Master of Optometry, Master of Public Health, Master of Social Welfare, Doctor of Education, Graduate in Architecture, Civil Engineer, Electrical Engineer, Mechanical Engineer, Metallurgical Engineer, Mining Engineer, Petroleum Engineer, Bachelor of Laws, Master of Laws, Juris Scientiae Doctor, Doctor of Medicine, Doctor of Public Health, Doctor of Veterinary Medicine, and Doctor of Philosophy.

**COURSES OF INSTRUCTION OFFERED IN THE
DEPARTMENTS AT BERKELEY
FOR FALL AND SPRING SEMESTERS
ACADEMIC YEAR 1951-1952**

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

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

(3) *Graduate courses* (numbered 200-299). As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation normally consists of the completion of at least 12 units of upper division work basic to the subject of the graduate course, irrespective of the department in which such basic work may have been completed.

(4) *Professional teacher-training courses* in the Department of Education

and courses in other departments that are specially intended for teachers or prospective teachers (numbered 300-399).

(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.

AGRICULTURE* †

- Richard L. Adams, M.S., Sc.D. (hon.c.), *Professor of Farm Management.*
Frank W. Allen, M.S., *Professor of Pomology, Davis.*
Daniel I. Arnon, Ph.D., *Professor of Plant Physiology.*
Vigfus S. Asmundson, Ph.D., *Professor of Poultry Husbandry, Davis.*
Stanley F. Bailey, Ph.D., *Professor of Entomology, Davis.*
Roy Bainer, M.S., *Professor of Agricultural Engineering (Chairman of the Division), Davis.*
William E. Ball, Lieutenant Colonel, Infantry; *Professor of Military Science and Tactics, Davis.*
Horace A. Barker, Ph.D., *Professor of Plant Biochemistry (Chairman of the Division).*
Leon D. Batchelor, Ph.D., *Professor of Horticulture, Riverside.*
‡Murray R. Benedict, Ph.D., *Professor of Agricultural Economics.*
James P. Bennett, Ph.D., *Professor of Plant Physiology.*
Geoffrey B. Bodman, Ph.D., *Professor of Soil Physics (Chairman of the Division of Soils).*
Alfred M. Boyce, Ph.D., *Professor of Entomology, Riverside.*
Raymond G. Bressler, Jr., Ph.D., *Professor of Agricultural Economics.*
Fred N. Briggs, Ph.D., *Professor of Agronomy (Chairman of the Division), Davis.*
Frederick A. Brooks, M.E., Sc.D., *Professor of Agricultural Engineering, Davis.*
Hugh S. Cameron, D.V.M., Ph.D., *Professor of Veterinary Science, Davis.*
Homer D. Chapman, Ph.D., *Professor of Agricultural Chemistry (Chairman of the Division of Soils and Plant Nutrition), Riverside.*
Roy E. Clausen, Ph.D., *Professor of Genetics (Chairman of the Division).*
Harold H. Cole, Ph.D., *Professor of Animal Husbandry (Acting Chairman of the Division), Davis.*
John P. Conrad, Ph.D., *Professor of Agronomy, Davis.*
Alden S. Crafts, Ph.D., *Professor of Botany (Chairman of the Division), Davis.*
Robert L. Crocker, Sc.D., *Professor of Soil Morphology.*
William V. Cruess, Ph.D., *Professor of Food Technology.*
Luther D. Davis, Ph.D., *Professor of Pomology, Davis.*
John E. Eckert, Ph.D., *Professor of Entomology, Davis.*
Henry E. Erdman, Ph.D., *Professor of Agricultural Economics.*
Katherine Esau, Ph.D., *Professor of Botany, Davis.*
Edward O. Essig, M.S., *Professor of Entomology.*
Stanley E. Flanders, Ph.D., *Professor of Biological Control, Riverside.*

* Herein are described the courses in the Department of Agriculture to be given in Berkeley, fall and spring semesters, 1951-1952, with lists of courses to be given at the College of Agriculture at Davis and at the Citrus Experiment Station at Riverside that are likely to be of interest to students in the College of Agriculture resident in Berkeley in planning their programs for the degree of Bachelor of Science. For description of courses given at Davis, Los Angeles, and Riverside refer to the PROSPECTUS OF THE COLLEGE OF AGRICULTURE for 1951-1952, to be obtained from the Dean of the College of Agriculture, University of California, Berkeley 4.

† The designation "Davis" or "Riverside," etc., following the title of officers of instruction indicates that instruction is offered by the instructor named on that campus. Otherwise instruction is on the Berkeley campus.

‡ Absent on leave, 1951-1952.

- Stanley B. Freeborn, Ph.D., Sc.D. (hon.c.), *Professor of Entomology (Vice-Chairman of the Department of Agriculture)*.
- Max W. Gardner, Ph.D., Sc.D. (hon.c.), *Professor of Plant Pathology (Chairman of the Division)*.
- Harold Goss, Ph.D., *Professor of Animal Husbandry, Davis*.
- Paul W. Gregory, Sc.D., *Professor of Animal Husbandry, Davis*.
- Frederick L. Griffin, M.S., *Professor of Agricultural Education, Davis*.
- Harold R. Guilbert, M.S., *Professor of Animal Husbandry, Davis*.
- Hans N. Hansen, Ph.D., *Professor of Plant Pathology*.
- George H. Hart, M.D., V.M.D., *Professor of Veterinary Science (Chairman of the Department of Veterinary Science), Davis*.
- William Z. Hassid, Ph.D., *Professor of Plant Biochemistry*.
- Robert W. Hodgson, M.S., *Professor of Subtropical Horticulture, Los Angeles (Vice-Chairman of the Department of Agriculture)*.
- Sidney S. Hoos, Ph.D., *Professor of Agricultural Economics*.
- William M. Hoskins, Ph.D., *Professor of Entomology*.
- Claude B. Hutchison, M.S., LL.D., D.Agr. (hon.c.), *Professor of Agriculture (Chairman of the Department of Agriculture)*.
- Eugene L. Jack, Ph.D., *Professor of Dairy Industry (Chairman of the Division), Davis*.
- Hans Jenny, Sc.D., *Professor of Soil Chemistry and Morphology*.
- Clarence N. Johnston, M.E., *Professor of Irrigation, Davis*.
- Maynard A. Joslyn, Ph.D., *Professor of Food Technology*.
- James B. Kendrick, Ph.D., *Professor of Plant Pathology, Davis*.
- Max Kleiber, Sc.D., *Professor of Animal Husbandry, Davis*.
- Leo J. Klotz, Ph.D., *Professor of Plant Pathology (Chairman of the Division), Riverside*.
- James E. Knott, Ph.D., Sc.D. (hon.c.), *Professor of Truck Crops (Chairman of the Division), Davis*.
- Lysle D. Leach, Ph.D., *Professor of Plant Pathology, Davis*.
- Samuel Lepkovsky, Ph.D., *Professor of Poultry Husbandry*.
- I. Michael Lerner, Ph.D., *Professor of Poultry Husbandry*.
- R. Merton Love, Ph.D., *Professor of Agronomy, Davis*.
- John H. MacGillivray, Ph.D., *Professor of Truck Crops, Davis*.
- Gordon Mackinney, Ph.D., *Professor of Food Technology*.
- Ben A. Madson, B.S.A., *Professor of Agronomy, Davis*.
- Sylvester W. Mead, M.S., *Professor of Animal Husbandry, Davis*.
- Emil M. Mrak, Ph.D., *Professor of Food Technology (Chairman of the Division)*.
- Courtland S. Mudge, Ph.D., *Professor of Bacteriology (Chairman of the Division), Davis*.
- Roy Overstreet, Ph.D., *Professor of Soil Chemistry*.
- Stuart A. Peoples, M.D., *Professor of Comparative Pharmacology, Davis*.
- Russell L. Perry, M.E., *Professor of Agricultural Engineering, Davis*.
- Edward L. Proebsting, Ph.D., *Professor of Pomology, Davis*.
- Vernon J. Puryear, Ph.D., *Professor of History (Chairman of the Division), Davis*.
- Thomas E. Rawlins, Ph.D., *Professor of Plant Pathology*.
- Edward B. Roessler, Ph.D., *Professor of Mathematics (Chairman of the Division of Mathematics and Physics), Davis*.

- Knowles A. Ryerson, M.S., *Professor of Horticulture (Vice-Chairman of the Department of Agriculture), Davis.*
- Oscar W. Schalm, Ph.D., *Professor of Veterinary Science, Davis.*
- Harry W. Shepherd, B.S., *Professor of Landscape Architecture.*
- Leslie M. Smith, Ph.D., *Professor of Entomology, Davis.*
- William C. Snyder, Ph.D., *Professor of Plant Pathology.*
- G. Ledyard Stebbins, Ph.D., *Professor of Genetics, Davis.*
- George F. Stewart, Ph.D., *Professor of Poultry Husbandry (Chairman of the Division), Davis.*
- Morris A. Stewart, Ph.D., *Professor of Parasitology.*
- Tracy I. Storer, Ph.D., *Professor of Zoölogy (Chairman of the Division), Davis.*
- Perry R. Stout, Ph.D., *Professor of Plant Nutrition (Chairman of the Division).*
- Lewis W. Taylor, Ph.D., *Professor of Poultry Husbandry.*
- H. Earl Thomas, Ph.D., *Professor of Plant Pathology.*
- James M. Tinley, Ph.D., *Professor Agricultural Economics, Davis.*
- Jacob Traum, D.V.M., *Professor of Veterinary Science, Davis.*
- Warren P. Tufts, Ph.D., *Professor of Pomology (Chairman of the Division).*
- H. Leland Vaughan, B.S., *Professor of Landscape Architecture (Chairman of the Division).*
- Frank J. Veihmeyer, C.E., Ph.D., *Professor of Irrigation (Chairman of the Division), Davis.*
- Edwin C. Voorhies, B.S., *Professor of Agricultural Economics.*
- Siegfried V. Wantrup, D.Agr., *Professor of Agricultural Economics.*
- David Weeks, Ph.D., *Professor of Agricultural Economics.*
- Thomas E. Weier, Ph.D., *Professor of Botany, Davis.*
- Harry R. Wellman, Ph.D., *Professor of Agricultural Economics (Chairman of the Division).*
- Edward E. Wilson, Ph.D., *Professor of Plant Pathology, Davis.*
- James F. Wilson, M.A., LL.D., *Professor of Animal Husbandry, Davis.*
- Albert J. Winkler, Ph.D., *Professor of Viticulture (Chairman of the Division), Davis.*
- Celeste T. Wright, Ph.D., *Professor of English (Chairman of the Division of Languages and Literature), Davis.*
- Cecil E. Yarwood, Ph.D., *Professor of Plant Pathology.*
- Herbert A. Young, Ph.D., *Professor of Chemistry, Davis.*
- Frank Adams, M.A., LL.D. (hon.c.), *Professor of Irrigation, Emeritus, Davis.*
- Ernest B. Babcock, M.S., LL.D., *Professor of Genetics, Emeritus.*
- James T. Barrett, Ph.D., *Professor of Plant Pathology, Emeritus.*
- Elbert T. Bartholomew, Ph.D., *Professor of Plant Physiology, Emeritus, Riverside.*
- William H. Boynton, D.V.M., *Professor of Veterinary Science, Emeritus, Davis.*
- John S. Burd, B.S., *Professor of Plant Nutrition, Emeritus.*
- Ira J. Condit, Ph.D., *Professor of Subtropical Horticulture, Emeritus, Riverside.*
- Walter H. Dore, B.S., *Professor of Plant Nutrition, Emeritus.*
- John W. Gregg, B.S., Dr. Land. Arch., *Professor of Landscape Design, Emeritus.*

- Walter P. Kelley, Ph.D., LL.D., *Professor of Soil Chemistry, Emeritus.*
 Ben D. Moses, B.S., *Professor of Agricultural Engineering, Emeritus, Davis.*
 Henry J. Quayle, M.S., *Professor of Entomology, Emeritus, Riverside.*
 William M. Regan, M.S., *Professor of Animal Husbandry, Emeritus, Davis.*
 Chester L. Roadhouse, D.V.M., *Professor of Dairy Industry, Emeritus, Davis.*
 Wilfred W. Robbins, Ph.D., *Professor of Botany, Emeritus, Davis.*
 Harry S. Smith, M.A., *Professor of Entomology, Emeritus, Riverside.*
 Ralph E. Smith, Sc.D., *Professor of Plant Pathology, Emeritus.*
 Edwin C. Van Dyke, M.D., *Professor of Entomology, Emeritus.*
 Harry B. Walker, C.E., *Professor of Agricultural Engineering, Emeritus, Davis.*
 Maynard A. Amerine, Ph.D., *Associate Professor of Enology, Davis.*
 Peter A. Ark, Ph.D., *Associate Professor of Plant Pathology.*
 George A. Baker, Ph.D., *Associate Professor of Mathematics, Davis.*
 Reid M. Brooks, Ph.D., *Associate Professor of Pomology, Davis.*
 Albert C. Burdette, Ph.D., *Associate Professor of Mathematics, Davis.*
 John F. Christensen, D.V.M., Ph.D., *Associate Professor of Veterinary Science, Davis.*
 Lawrence L. Claypool, Ph.D., *Associate Professor of Pomology, Davis.*
 John S. Cole, M.Sc., *Associate Professor of Military Science and Tactics, Davis.*
 Roderick Craig, Ph.D., *Associate Professor of Insect Physiology.*
 Glen N. Davis, Ph.D., *Associate Professor of Truck Crops, Davis.*
 Lannes E. Davis, Ph.D., *Associate Professor of Soils, Davis.*
 Everett R. Dempster, Ph.D., *Associate Professor of Genetics.*
 James R. Douglas, Ph.D., *Associate Professor of Parasitology, Davis.*
 William H. English, Ph.D., *Associate Professor of Plant Pathology, Davis.*
 Solomon Fishman, Ph.D., *Associate Professor of English, Davis.*
 Julius H. Freitag, Ph.D., *Associate Professor of Entomology.*
 Varden Fuller, Ph.D., *Associate Professor of Agricultural Economics.*
 Milton E. Gardner, Ph.D., *Associate Professor of Physics, Davis.*
 Trimble R. Hedges, Ph.D., *Associate Professor of Agricultural Economics, Davis.*
 William B. Hewitt, Ph.D., *Associate Professor of Plant Pathology, Davis.*
 Byron R. Houston, Ph.D., *Associate Professor of Plant Pathology, Davis.*
 Carroll Howell, M.S., *Associate Professor of Animal Husbandry, Davis.*
 Donald E. Jasper, Ph.D., D.V.M., *Associate Professor of Veterinary Medicine, Davis.*
 James A. Jenkins, Ph.D., *Associate Professor of Genetics.*
 Raymond M. Keefer, Ph.D., *Associate Professor of Chemistry, Davis.*
 F. Howard Kratzer, Ph.D., *Associate Professor of Poultry Husbandry, Davis.*
 George M. Kuznets, Ph.D., *Associate Professor of Agricultural Economics.*
 E. Gorton Linsley, Ph.D., *Associate Professor of Entomology (Chairman of the Division of Entomology and Parasitology).*
 Frederick W. Lorenz, Ph.D., *Associate Professor of Poultry Husbandry, Davis.*
 Oscar A. Lorenz, Ph.D., *Associate Professor of Truck Crops, Davis.*
 Arthur Douglas McLaren, Ph.D., *Associate Professor of Soil Chemistry.*
 George L. Marsh, M.S., *Associate Professor of Food Technology.*
 George L. Mehren, Ph.D., *Associate Professor of Agricultural Economics.*
 Abe E. Michelbacher, Ph.D., *Associate Professor of Entomology.*

- Milton A. Miller, Ph.D., *Associate Professor of Zoölogy, Davis.*
Iver N. Nelson, Ph.D., *Associate Professor of Spanish, Davis.*
Loren W. Neubauer, Ph.D., *Associate Professor of Agricultural Engineering, Davis.*
Harold P. Olmo, Ph.D., *Associate Professor of Viticulture, Davis.*
Edgar P. Painter, Ph.D., *Associate Professor of Chemistry, Davis.*
Charles G. Patten, Ph.D., *Associate Professor of Physics, Davis.*
Maurice L. Peterson, Ph.D., *Associate Professor of Agronomy, Davis.*
Harold G. Reiber, Ph.D., *Associate Professor of Chemistry (Chairman of the Division), Davis.*
Charles M. Rick, Jr., Ph.D., *Associate Professor of Truck Crops, Davis.*
Lauren E. Rosenberg, Ph.D., *Associate Professor of Zoölogy, Davis.*
Francis L. Smith, Ph.D., *Associate Professor of Agronomy, Davis.*
Edward A. Steinhaus, Ph.D., *Associate Professor of Insect Pathology.*
Nikita P. Tarassuk, Ph.D., *Associate Professor of Dairy Industry, Davis.*
Robert L. Usinger, Ph.D., *Associate Professor of Entomology.*
Reese H. Vaughn, Ph.D., *Associate Professor of Food Technology.*
Francis J. Violich, B.S., *Associate Professor of Landscape Architecture and Lecturer in City Planning.*
David H. Volman, Ph.D., *Associate Professor of Chemistry, Davis.*
Frederick P. Zscheile, Jr., Ph.D., *Associate Professor of Agronomy, Davis.*
Henry L. Alder, Ph.D., *Assistant Professor of Mathematics, Davis.*
Robert W. Allard, Ph.D., *Assistant Professor of Agronomy, Davis.*
Merlin W. Allen, Ph.D., *Assistant Professor of Entomology.*
Lawrence J. Andrews, Ph.D., *Assistant Professor of Chemistry, Davis.*
Hubert A. Arnold, Ph.D., *Assistant Professor of Mathematics, Davis.*
Oscar G. Bacon, Ph.D., *Assistant Professor of Entomology.*
Richard E. Baker, Ph.D., *Assistant Professor of Pomology, Davis.*
Raymond A. Bankowski, D.V.M., Ph.D., *Assistant Professor of Veterinary Science, Davis.*
Richard M. Bohart, Ph.D., *Assistant Professor of Entomology, Davis.*
Robert K. Brinton, Ph.D., *Assistant Professor of Chemistry, Davis.*
Dillon S. Brown, Ph.D., *Assistant Professor of Pomology, Davis.*
Spencer W. Brown, Ph.D., *Assistant Professor of Genetics.*
Floyd D. Carroll, Ph.D., *Assistant Professor of Animal Husbandry, Davis.*
John G. B. Castor, Ph.D., *Assistant Professor of Viticulture, Davis.*
Edwin B. Collins, Ph.D., *Assistant Professor of Dairy Industry, Davis.*
George A. Cook, Captain, Infantry; *Assistant Professor of Military Science and Tactics, Davis.*
Donald R. Cordy, Ph.D., *Assistant Professor of Veterinary Science, Davis.*
Julian C. Crane, Ph.D., *Assistant Professor of Pomology, Davis.*
Perry T. Cupps, Ph.D., *Assistant Professor of Animal Husbandry, Davis.*
Herbert B. Currier, Ph.D., *Assistant Professor of Botany, Davis.*
Paul R. Day, Ph.D., *Assistant Professor of Soil Physics.*
Robert B. Deering, Ph.D., *Assistant Professor of Landscape Gardening, Davis.*
Constant C. Delwiche, Ph.D., *Assistant Professor of Plant Biochemistry.*
Richard L. Doutt, Ph.D., *Assistant Professor of Biological Control.*
Walter L. Dunkley, Ph.D., *Assistant Professor of Dairy Industry, Davis.*
♥ John Erway, Ph.D., *Assistant Professor of Dairy Industry, Davis.*

♥ On military leave, 1951-1952.

- Jerry Foytik, Ph.D., *Assistant Professor of Agricultural Economics, Davis.*
 Curtis M. Fulton, Ph.D., *Assistant Professor of Mathematics, Davis.*
 Deane P. Furman, Ph.D., *Assistant Professor of Entomology.*
 Ernest M. Gifford, Jr., Ph.D., *Assistant Professor of Botany, Davis.*
 Harold T. Gordon, Ph.D., *Assistant Professor of Entomology.*
 Charles R. Grau, Ph.D., *Assistant Professor of Poultry Husbandry.*
 Melvin M. Green, Ph.D., *Assistant Professor of Genetics, Davis.*
 William H. Griggs, Ph.D., *Assistant Professor of Pomology, Davis.*
 Raymond G. Grogan, Ph.D., *Assistant Professor of Plant Pathology, Davis.*
 James F. Guymon, Ph.D., *Assistant Professor of Viticulture, Davis.*
 Robert M. Hagan, Ph.D., *Assistant Professor of Irrigation, Davis.*
 Theodore J. Hage, D.V.M., *Assistant Professor of Veterinary Medicine, Davis.*
 Carl J. Hansen, M.S., *Assistant Professor of Pomology, Davis.*
 James F. Harrington, Ph.D., *Assistant Professor of Truck Crops, Davis.*
 Hudson T. Hartmann, Ph.D., *Assistant Professor of Pomology, Davis.*
 Charles A. Hayes, Jr., Ph.D., *Assistant Professor of Mathematics, Davis.*
 Hubert Heitman, Jr., Ph.D., *Assistant Professor of Animal Husbandry, Davis.*
 Claron O. Hesse, Ph.D., *Assistant Professor of Pomology, Davis.*
 Charles G. Higgins, Jr., Ph.D., *Assistant Professor of Geology, Davis.*
 Louis W. Holm, Ph.D., *Assistant Professor of Veterinary Medicine, Davis.*
 Elizabeth R. Homann, Ph.D., *Assistant Professor of English, Davis.*
 Jack A. Howarth, D.V.M., *Assistant Professor of Veterinary Medicine, Davis.*
 William L. Hunter, Captain, Infantry; *Assistant Professor of Military Science and Tactics, Davis.*
 William T. Jackson, Ph.D., *Assistant Professor of History, Davis.*
 Louis Jacobson, Ph.D., *Assistant Professor of Plant Nutrition.*
 Dilworth D. Jensen, Ph.D., *Assistant Professor of Entomology.*
 John W. Kendrick, D.V.M., *Assistant Professor of Veterinary Science, Davis.*
 Richard E. Kepner, Ph.D., *Assistant Professor of Chemistry, Davis.*
 Robert A. Kepner, B.S., *Assistant Professor of Agricultural Engineering, Davis.*
 Paulden F. Knowles, Ph.D., *Assistant Professor of Agronomy, Davis.*
 Harry H. Laidlaw, Jr., Ph.D., *Assistant Professor of Entomology, Davis.*
 Horton M. Laude, Ph.D., *Assistant Professor of Agronomy, Davis.*
 Ivan M. Lee, Ph.D., *Assistant Professor of Agricultural Economics.*
 Roy B. Litton, Jr., M.L.A., *Assistant Professor of Landscape Architecture.*
 Glen P. Lofgreen, Ph.D., *Assistant Professor of Animal Husbandry, Davis.*
 James N. Luthin, Ph.D., *Assistant Professor of Irrigation, Davis.*
 Neil A. MacLean, Ph.D., *Assistant Professor of Plant Pathology.*
 John W. MacSwain, Ph.D., *Assistant Professor of Entomology.*
 Louis K. Mann, Ph.D., *Assistant Professor of Truck Crops, Davis.*
 Delbert G. McKercher, Ph.D., *Assistant Professor of Veterinary Medicine, Davis.*
 Woodrow W. Middlekauff, Ph.D., *Assistant Professor of Entomology.*
 Duane S. Mikkelsen, Ph.D., *Assistant Professor of Agronomy, Davis.*
 Leonard L. Morris, Ph.D., *Assistant Professor of Truck Crops, Davis.*
 Gwendolyn B. Needham, Ph.D., *Assistant Professor of English, Davis.*
 George Nyland, Ph.D., *Assistant Professor of Plant Pathology, Davis.*
 Carl B. O'Brien, Ph.D., *Assistant Professor of History, Davis.*

- John W. Oswald, Ph.D., *Assistant Professor of Plant Pathology, Davis.*
 Herman J. Phaff, Ph.D., *Assistant Professor of Food Technology.*
 Harlan K. Pratt, Ph.D., *Assistant Professor of Truck Crops, Davis.*
 Arthur E. Pritchard, Ph.D., *Assistant Professor of Entomology.*
 Siegfried B. Puknat, Ph.D., *Assistant Professor of German, Davis.*
 Donald M. Reynolds, Ph.D., *Assistant Professor of Bacteriology, Davis.*
 Wade C. Rollins, Ph.D., *Assistant Professor of Animal Husbandry, Davis.*
 Charles W. Schaller, Ph.D., *Assistant Professor of Agronomy, Davis.*
 Verne H. Scott, M.S., *Assistant Professor of Irrigation, Davis.*
 James H. Shideler, Ph.D., *Assistant Professor of History, Davis.*
 Paul G. Smith, Ph.D., *Assistant Professor of Truck Crops, Davis.*
 Ray F. Smith, Ph.D., *Assistant Professor of Entomology.*
 Ernest H. Stanford, Ph.D., *Assistant Professor of Agronomy, Davis.*
 Mortimer P. Starr, Ph.D., *Assistant Professor of Bacteriology, Davis.*
 Clarence Sterling, Ph.D., *Assistant Professor of Food Technology.*
 Clifford R. Stocking, Ph.D., *Assistant Professor of Botany, Davis.*
 Clyde N. Stormont, Ph.D., *Assistant Professor of Veterinary Science, Davis.*
 Paul K. Stumpf, Ph.D., *Assistant Professor of Plant Biochemistry.*
 Sidney S. Sutherland, M.S., *Assistant Professor of Education (Chairman of the Division), and Supervisor of Teacher Training in Agriculture, Davis.*
 Edward S. Sylvester, Ph.D., *Assistant Professor of Entomology.*
 William N. Takahashi, Ph.D., *Assistant Professor of Plant Pathology.*
 John M. Tucker, Ph.D., *Assistant Professor of Botany, Davis.*
 Linda Van Norden, Ph.D., *Assistant Professor of English, Davis.*
 Roland F. Vetter, D.V.M., *Acting Assistant Professor of Veterinary Science, Davis.*
 Albert D. Webb, Ph.D., *Assistant Professor of Enology, Davis.*
 William C. Weir, Ph.D., *Assistant Professor of Animal Husbandry, Davis.*
 John D. Wheat, D.V.M., *Assistant Professor of Veterinary Science, Davis.*
 Stephen Wilhelm, Ph.D., *Assistant Professor of Plant Pathology.*
 Wilbor O. Wilson, Ph.D., *Assistant Professor of Poultry Husbandry, Davis.*
 Guy Black, Ph.D., *Instructor in Agricultural Economics.*
 Robert H. Burgy, M.S., *Instructor in Irrigation, Davis.*
 Leonard P. Burton, Ph.D., *Instructor in Mathematics, Davis.*
 Leonard E. Carrier, Ph.D., *Instructor in Landscape Gardening, Davis.*
 George L. Gallaher, M.S., *Instructor in Agricultural Engineering, Davis.*
 A. Herbert Gold, Ph.D., *Instructor in Plant Pathology.*
 Edgar L. Haff, Jr., Ph.D., *Instructor in Agricultural Economics.*
 Thomas A. Hanzo, M.S., *Acting Instructor in English, Davis.*
 Richard W. Harris, Ph.D., *Instructor in Pomology, Davis.*
 Delbert W. Henderson, B.S., *Instructor in Irrigation, Davis.*
 Ralph W. Jones, B.S., *Instructor in Landscape Gardening, Davis.*
 Dale E. Kester, Ph.D., *Instructor in Pomology, Davis.*
 Robert C. Laben, M.S., *Instructor in Animal Husbandry, Davis.*
 Lloyd H. Lamouria, M.S., *Instructor in Agricultural Engineering, Davis.*
 Lloyd A. Linder, B.S., *Instructor in Viticulture, Davis.*
 W. J. Mathey, Jr., V.M.D., *Acting Instructor in Veterinary Science, Davis.*
 James H. Meyer, M.S., *Instructor in Animal Husbandry, Davis.*
 Thomas A. Nickerson, Ph.D., *Instructor in Dairy Industry, Davis.*
 Donald A. Norton, Ph.D., *Instructor in Mathematics, Davis.*

♡ On military leave, 1951-1952.

Daniel W. Peterson, Ph.D., *Instructor in Poultry Husbandry.*
 Dale G. Smeltzer, Ph.D., *Instructor in Agronomy, Davis.*
 Arthur R. Spurr, Ph.D., *Instructor in Truck Crops, Davis.*
 William A. Williams, Ph.D., *Instructor in Agronomy, Davis.*
 Masatoshi Yamaguchi, Ph.D., *Instructor in Truck Crops, Davis.*
 Wesley E. Yates, M.S., *Instructor in Agricultural Engineering, Davis.*



Everett D. Howe, M.S., *Professor of Engineering.*
 Paul S. Taylor, Ph.D., *Professor of Economics.*
 Leonard Machlis, Ph.D., *Assistant Professor of Botany.*
 John G. Torrey, Ph.D., *Assistant Professor of Botany.*
 Norman B. Akesson, M.S., *Lecturer in Agricultural Engineering, Davis.*
 Isaac Barshad, Ph.D., *Lecturer in Soils.*
 Arthur D. Borden, M.A., *Lecturer in Entomology.*
 Carl E. Boyer, M.A., *Junior Supervisor of Physical Education, Davis.*
 Arnold Brekke, B.S., *Lecturer in Agricultural Economics, Davis.*
 Arthur L. Brown, Ph.D., *Lecturer in Soils, Davis.*
 Theodore C. Broyer, B.S., *Lecturer in Plant Nutrition.*
 Philip R. Bunnelle, M.S., *Lecturer in Agricultural Engineering, Davis.*
 Charles W. Bursch, II, A.B., *Lecturer in Education, Davis.*
 Donald R. Cameron, Ph.D., *Lecturer in Genetics.*
 David A. Clarke, Jr., M.S. *Lecturer in Agricultural Economics.*
 H. Edwin Cott, A.B., *Associate in Zoölogy, Davis.*
 Lloyd D. Doneen, Ph.D., *Lecturer in Irrigation, Davis.*
 John B. Enright, Ph.D., *Lecturer in Veterinary Science, Davis.*
 Theodore W. Forbes, B.S., *Assistant Supervisor of Physical Education, Davis.*
 Norman W. Frazier, Ph.D., *Lecturer in Entomology.*
 Earl H. Gray, M.D., *Lecturer in Radiology, Davis.*
 Waldemar C. Gunther, B.S., *Associate in Zoölogy, Davis.*
 Gordie C. Hanna, B.S., *Lecturer in Truck Crops, Davis.*
 S. Milton Henderson, M.S., *Lecturer in Agricultural Engineering, Davis.*
 William H. Henderson, B.S., *Associate in Zoölogy, Davis.*
 Arthur H. Hendrickson, Ph.D., *Lecturer in Pomology, Davis.*
 Vernard B. Hickey, A.B., *Associate Supervisor of Physical Education, Davis.*
 Milton Hildebrand, Ph.D., *Lecturer in Zoölogy, Davis.*
 Anna K. Horne, M.A., *Junior Supervisor of Physical Education, Davis.*
 Walter E. Howard, Ph.D., *Lecturer in Zoölogy, Davis.*
 Bruce E. Hubbell, Jr., B.S., *Associate in Dairy Industry, Davis.*
 Arline Johnson, M.S., *Lecturer in Education, Davis.*
 Elwood M. Juergenson, M.Ed., *Lecturer in Education, Davis.*
 Logan M. Julian, D.V.M., *Lecturer in Veterinary Science, Davis.*
 Jack L. Laffin, B.S., *Lecturer in Landscape Architecture.*
 William H. Lange, Jr., Ph.D., *Lecturer in Entomology, Davis.*
 Harold D. Lewis, B.S., *Associate in Agricultural Engineering, Davis.*
 Omund Lilleland, Ph.D., *Lecturer in Pomology, Davis.*
 Coby Lorenzen, Jr., M.S., *Lecturer in Agricultural Engineering, Davis.*
 Lawrence E. McArdell, A.B., *Supervisor of Music, Davis.*
 James C. Marr, A.E., *Lecturer in Irrigation, Davis.*
 Michael O'Brien, M.S., *Lecturer in Agricultural Engineering, Davis.*
 John W. Osebold, D.V.M., *Lecturer in Veterinary Science, Davis.*
 Clement A. Phillips, M.S., *Lecturer in Dairy Industry, Davis.*

- Joseph D. Phillips, Jr., Ph.D., *Lecturer in Agricultural Economics, Davis.*
 Dewey J. Raski, Ph.D., *Lecturer in Entomology.*
 Edward A. Rhode, Jr., D.V.M., *Associate in Veterinary Medicine, Davis.*
 Russell T. Robinson, B.S., *Lecturer in Agricultural Economics, Davis.*
 George W. Salt, M.A., *Lecturer in Zoölogy, Davis.*
 Myron R. Schall, A.B., *Assistant Supervisor of Physical Education, Davis.*
 Eugene F. Serr, Jr., B.S., *Lecturer in Pomology, Davis.*
 James E. Sharkey, D.V.M., *Associate in Veterinary Medicine, Davis.*
 Gordon R. Sitton, B.S., *Lecturer in Agricultural Economics, Davis.*
 Arthur H. Smith, Ph.D., *Lecturer in Poultry Husbandry, Davis.*
 Eugene M. Stafford, Ph.D., *Lecturer in Entomology, Davis.*
 Raymond E. Storie, B.S., *Lecturer in Soil Technology.*
 George A. Stromgren, A.B., *Assistant Supervisor of Physical Education, Davis.*
 Francis M. Summers, Ph.D., *Lecturer in Entomology, Davis.*
 James R. Tavernetti, M.S., *Lecturer in Agricultural Engineering, Davis.*
 Irving F. Toomey, B.S., *Supervisor of Physical Education (Chairman of the Division), Davis.*
 James E. Welch, Ph.D., *Lecturer in Truck Crops, Davis.*
 Marya Welch, M.A., *Assistant Supervisor of Physical Education, Davis.*
 Robert A. Wiggins, M.A., *Lecturer in English, Davis.*
 William O. Williams, Ph.D., *Lecturer in Viticulture, Davis.*
 Eugene S. Wilson, B.S., *Associate Supervisor of Physical Education, Davis.*

Letters and Science List.—The following courses are included in the Letters and Science List of Courses: Agricultural Economics 100, 112A–112B, 116; Entomology 100, 106, 112, 117, 126, 127, 129; Forestry 1, 103, 125; all undergraduate courses in genetics; Home Economics 1A–1B, 6, 10, 14, 101A–101B, 111, 112A–112B, 114, 118A–118B, 132, 134, 142, 152, and 160; Plant Biochemistry 123; Plant Nutrition 115, 117; Plant Pathology 121; Soil Science 110, 111, 112, 113, 114. For regulations governing this list, see page 69.

Upper Division Courses.—All upper division courses announced by this department presuppose at least junior standing in the College of Agriculture. Juniors and seniors in other colleges may elect such courses in the Department of Agriculture as they are qualified to pursue.

Honors.—Students who become candidates for the bachelor's degree in the College of Agriculture may be recommended for honors on the basis of the quality of the work done in the regular curriculum.

Graduate Work.—Concerning conditions for admission to graduate courses see page 139 of this bulletin. Students who intend to become candidates for higher degrees in the Department of Agriculture will be required to give evidence of the completion of an amount of work equivalent, in its value, to that required by the College of Agriculture for the degree of Bachelor of Science. The student is referred to the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, for details of graduate work in the various fields of agriculture.

(GIVEN AT BERKELEY)

AGRICULTURAL CHEMISTRY

GRADUATE COURSE

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

The Staff and members of the Group in Agricultural Chemistry†
 The research work will ordinarily be under the direction of a member of

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

the instructing staff who is in the field of agriculture in which the student's preparation has been found to be adequate.

AGRICULTURAL ECONOMICS

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

- *1. The Agricultural Industry. (3) II. Mr. Voorhies
Comparison of agriculture with other industries: population, production, improvements, trends, etc. Historical sketch of the development of agriculture. Types of farming and their geographical distribution. Movements of agricultural products. Institutional aids to agriculture.
100. Comparative Agriculture. (3) I. Mr. Voorhies
Prerequisite: Economics 1A-1B.
The agriculture of the principal countries of the world, with special reference to the influence of food supply upon the development of man.
- 101A. Principles of Marketing Agricultural Products. (3) I. Mr. Erdman
Prerequisite: Economics 1A-1B.
Not open to students who have completed Business Administration 160.
Nature of the problems, types of marketing agencies, principal marketing functions and their combination, marketing costs and margins, price quotations and speculation in farm products; government in its relation to marketing; consideration of proposals for improvement.
- 101B. Coöperation in Agriculture. (3) I. Mr. Erdman
Prerequisite: Economics 1A-1B.
Farmers' coöperative organizations.
102. Land Economics. (3) I. Mr. Weeks
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.
104. Agricultural Economics. (3) II. Mr. Bressler
Prerequisite: Economics 1A-1B.
The application of economic principles to the problems of agriculture.
105. Agricultural Economics Measurements. (3) II. Mr. Lee
Lectures and laboratory.
Prerequisite: Economics 2; Mathematics 11A-11B, 16A-16B, or 3A-3B.
Sources; collection of data; and analysis of selected measurements, including parity prices, parity income, employment, wages, production, and national income.
- *107. Market Prices. (3) II. Mr. Wellman
Prerequisite: Agricultural Economics 104, 105.
Application of economic principles and measurements in the analysis of the behavior of agricultural prices.
110. Agricultural Finance. (3) I. Mr. Voorhies
Prerequisite: Economics 1A-1B.
Farmers' credit needs, methods of financing the agricultural industry, and the agencies supplying agricultural credit.

* Not to be given, 1951-1952.

111. Economics of Food Consumption. (3) II. Mr. Fuller
Prerequisite: Economics 1A-1B.
Food requirements in relation to national and international policies on agriculture and trade; economic analysis of programs and proposals designed to improve and stabilize nutrition.
- 112A-112B. Rural Sociology. (2-2) Yr. Mr. P. S. Taylor
Agricultural Economics 112A is prerequisite to 112B.
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.
116. Agricultural Policy. (3) II. Mr. Fuller
Prerequisite: Economics 1A-1B.
The evolution of agricultural policy in the United States. Historical and analytical treatment of principal farmer movements, legislative provisions for the betterment of agriculture, and current policy problems.
118. Farm Organization. (3) II. Mr. R. L. Adams
Prerequisite: at least one course in agriculture.
The place, purpose, and scope of organization; farm enterprises; selecting farms; planning and equipping; capital needs; earnings.
119. Farm Management. (3) II. Mr. R. L. Adams
Prerequisite: at least one course in agriculture.
Methods of handling properties; duties and qualifications of managers; bookkeeping and accounting; marketing methods; farm labor; tenancy; farm law.
- *122. Coöperative Management. (3) I. Mr. Tinley
Prerequisite: Agricultural Economics 101A-101B and Business Administration 1A.
Analysis of organizational and operational problems and policies of agricultural coöperative associations.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Voorhies in charge)
Prerequisite: senior standing and approval of the Division. Limited to agricultural economics majors.

GRADUATE COURSES

202. Seminar in Agricultural Policy. (2) II. Mr. Wellman
A study of public and semipublic activities pertaining to agriculture as an industry.
203. Research in Agricultural Economics. (1-6) I and II.
The Staff (Mr. Wellman in charge)
- 204A-204B. Analytical Methods in Agricultural Economics. (3-3) Yr.
204A: Mr. Kuznets; 204B: Mr. Lee. Mr. Kuznets, Mr. Lee
Evaluation and treatment of economic data in agriculture, with emphasis on methods of analyzing relations between two or more variables.
205. Seminar in the Marketing of Agricultural Products. (2) II. Mr. Bressler
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.

* Not to be given, 1951-1952.

- 206B. Economics of Agricultural Production. (3) II. Mr. Bressler
The application of economic principles to problems of production adjustment.
207. Advanced Land Economics. (2) I. Mr. Weeks
Land policies, planning, rent, tenure, appraisal, development, and utilization.
208. Seminar in the Conservation of Natural Resources. (2) II. Mr. Wantrup
The economic and social aspects of the conservation of natural resources in the United States and foreign countries, with particular reference to agriculture.
209. Seminar in Agricultural Market Organization. (3) I. Mr. Erdman
An analysis of the economic factors influencing organization and operating efficiency, price and sales policies, and the financial structure of different marketing organizations.
212. Seminar in Farm Management. (2) II. Mr. R. L. Adams
An analysis of economic factors, trends, and relationships which bear upon farm organization and administration; farm management techniques.
299. Special Study for Graduate Students. (1-4) I and II. The Staff (Mr. Wellman in charge)
Any properly qualified graduate student may investigate a special field of study if his proposed program is acceptable to the member of the staff with whom he works.

AGRICULTURAL ENGINEERING

12. Survey and Problems in Agricultural Engineering. (2) II. Mr. Bainer, ———
The development and the application and use of farm machinery; the utilization of power on the farm; elements of hydrology in relation to agricultural engineering; the economics of farm buildings; elementary problems in the mechanics of agriculture.

AGRONOMY

- *1. Introduction to Agronomy. (3) I. Mr. 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.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Briggs in charge)
Prerequisite: 6 units of upper division agronomy.

GRADUATE COURSE

- *200A-200B. Research in Agronomy. (1-6; 1-6) Yr. Mr. Briggs, Mr. Love, Mr. Laude

ENTOMOLOGY AND PARASITOLOGY

49. Summer Practice and Observation Course. (No credit)
Six weeks, daily, except Sunday. The Staff (Mr. Linsley in charge)
Required of all students with a major in entomology or parasitology.

* Not to be given, 1951-1952.

100. General Entomology. (4) I. Mr. Freeborn, Mr. MacSwain
(Formerly numbered 1.)
Lectures and laboratory.
The classification, life history, structure, and physiology of insects.
106. Insect Morphology and Histology. (4) II. Mr. Craig
Lectures and laboratory.
Prerequisite: Entomology and Parasitology 100.
Comparative insect anatomy; histological techniques.
110. Insect Physiology. (3) I. Mr. Craig
Lectures and laboratory.
Prerequisite: Chemistry 8, or equivalent.
The general principles of insect physiology with experimental studies on nutrition, digestion, excretion, circulation, respiration, and the nervous and hormonal systems.
112. Systematic Entomology. (4) I. Mr. Linsley
Lectures and laboratory.
Prerequisite: Entomology and Parasitology 100 or consent of the instructor.
The classification of insects, taxonomic categories and procedure; bibliographical methods; nomenclature; museum practices.
114. Forest Entomology. (3) I. Mr. MacSwain
Lectures and laboratory.
Identification, habits, and control of insects affecting forest, shade, and ornamental trees.
117. Helminthology. (4) I. Mr. M. A. Stewart, Mr. Furman
Lectures and laboratory.
Helminthic infections of man and domestic animals. The biology, prophylaxis, and treatment of the various parasites are dealt with in detail. Laboratory exercises are devoted to the taxonomy and identification of parasites and to diagnostic laboratory methods.
118. Plant Nematology. (4) II. Mr. M. W. Allen, Mr. Raski
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.
124. Economic Entomology. (4) II. Mr. Essig, Mr. Bacon
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. Frazier, Mr. Jensen
Lectures and laboratory.
The role of insects in the transmission and causation of plant virus diseases. Greenhouse insect-rearing and virus-transmission experiments.
126. Medical Entomology. (4) II. Mr. M. A. Stewart, Mr. Furman
Lectures and laboratory.
The role of insects and other arthropods in transmission and causation of diseases of humans and domesticated animals.
127. Insect Ecology. (3) II. Mr. Craig, Mr. Usinger
Prerequisite: upper division standing in one of the biological sciences.
Principles of ecology; animal communities; insect behavior.

128. Insect Toxicology. (4) I. Mr. Hoskins, Mr. Gordon
Lectures and laboratory.
Chemical composition and reactions of insecticides and fungicides, and their physiological effects on plant and animal tissues.
129. Biological Control of Insect and Weed Pests. (3) I. Mr. Doult
Lectures and laboratory.
Prerequisite: Entomology and Parasitology 100.
Principles and methods of biological control; biology of entomophagous insects; critical discussion of important world projects.
130. Agricultural Entomology. (3) II. Mr. Borden
Lectures and laboratory (field trip).
Prerequisite: Entomology and Parasitology 124.
An advanced course in the principles and practices of experimental field entomology.
131. Insect Pathology. (4) II. Mr. Steinhaus
Lectures and laboratory.
Prerequisite: Entomology and Parasitology 100 and at least one course in microbiological sciences (mycology, bacteriology, or protozoology).
General insect pathology and microbiology, including biological relationships between microorganisms and insects. Detailed study of bacterial, fungous, virus, and protozoan diseases of insects; noninfectious diseases; histopathology; microbial agents and biological control.
133. Biology of Aquatic and Littoral Insects. (4) II. Mr. Usinger
Lectures and laboratory.
Habits and ecology of aquatic and semiaquatic insects with emphasis on their relations to problems of wildlife management.
135. Insects in Relation to Flowering and Other Ornamental Plants. (3) I. Mr. Pritchard
Lectures and laboratory.
Prerequisite: Entomology and Parasitology 124.
The study of the importance, recognition, taxonomy, biology, ecology, and control of insects and related pests of flowering and other ornamental plants.
136. Insects and Their Relation to Commercial Vegetables and Field Crops. (4) II. Mr. Michelbacher, Mr. Middlekauff, Mr. R. F. Smith
Lectures and laboratory; one or more field trips.
Prerequisite: Entomology and Parasitology 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

- 200A-200B. Research in Entomology and Parasitology. (1-6; 1-6) Yr.
The Staff (Mr. Linsley and Mr. Doult in charge)
(Formerly numbered 201A-201B.)
- 201A-201B. Seminar in General Entomology. (1-1) Yr.
The Staff (Mr. Linsley in charge)
(Formerly numbered 200A-200B.)
- 202A-202B. Seminar in Medical Entomology and Parasitology. (1-1) Yr.
Mr. M. A. 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. Usinger
210. Insect Biochemistry. (3) I. Mr. Craig, Mr. Gordon, Mr. Hoskins
Lectures and laboratory.
Prerequisite: Entomology and Parasitology 110 and 128. Recommended: Entomology and Parasitology 106, 112, and 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: Entomology and Parasitology 112, or consent of the instructor.
The theory and philosophy of systematic entomology with emphasis on phylogeny, zoogeography, and nomenclature.
226. Advanced Medical Entomology. (2) I. Mr. Freeborn, Mr. Furman, Mr. M. A. Stewart
Prerequisite: Entomology and Parasitology 117 and 126; Bacteriology 101 and graduate standing. Recommended: Entomology and Parasitology 106, 112, and 127.
The genesis of arthropod-borne diseases.
232. History of Entomology. (3) II. Mr. Essig, Mr. Linsley
Prerequisite: Entomology and Parasitology 100 and one additional course in entomology.
Outline of the development of world entomology.

FOOD TECHNOLOGY

112. Principles and Practices of Food Processing. (3) I. Mr. Cruess
(Formerly numbered 112A.)
Prerequisite: thirteen units of chemistry and four units of bacteriology; for food technology majors, 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) II. Mr. Mackinney
(Formerly numbered 112B.)
Prerequisite: thirteen units of chemistry, including organic, and four units of bacteriology; for food technology majors, Bacteriology 1, 5 units.
Relation of food processing and handling to acceptability, color changes, enzyme activity, deterioration, flavor, vitamin retention, and other factors.
114. Principles of Food Processing Operations. (4) I. Mr. Vaughn
(Formerly numbered 115A.)
Lectures and laboratory.
Prerequisite: Chemistry 5 and 8; Bacteriology 1, or equivalent.
Technical principles relating to processing operations used in the commercial preservation of fruits, vegetables, and other foods; theory and practical applications, including field trips.

115. Food Analysis. (4) II. Mr. Joslyn
 (Formerly numbered 115B.)
 Lectures and laboratory.
 Prerequisite: Chemistry 5 and 8, or equivalent of both.
 Application of quantitative physical and chemical methods of analysis to examination of commercial fruit and vegetable products; laboratory control and research; methods of analysis as applied to food processing; interpretation of results in relation to manufacturing methods and commercial standards.
116. Yeasts and Related Organisms. (4) II.
 Lectures and laboratory. Mr. Joslyn, Mr. Mrak, Mr. Phaff
 Prerequisite: thirteen units in chemistry, including organic; four units of botany; a laboratory course in bacteriology.
 Morphology, development, classification and distribution of yeasts; relation to other fungi, growth requirements; physiological activities, including certain industrial aspects.
120. The Natural Coloring Matters. (3) II. Mr. Mackinney
 Lectures and laboratory.
 Prerequisite: three units of biochemistry or plant biochemistry, or upper division organic chemistry.
 Chemistry of natural pigments and related compounds; spectrophotometric and chromatographic techniques; special emphasis on pigments in relation to foods.
127. Recent Advances in Food Technology. (1) I and II.
The Staff (Mr. Joslyn in charge fall semester,
 Mr. Mackinney in charge spring semester)
 (Formerly numbered 127A-127B.)
 May be repeated once for credit.
 Prerequisite: two courses in food technology or the equivalent.
 Assigned topics, reports, and discussions concerning recent advances in food technology.
140. Unit Operations in Food Industries. (2) II. Mr. Joslyn, ———
 Prerequisite: Chemistry 8, 109; Bacteriology 1; or their equivalents.
 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. Joslyn in charge)

GRADUATE COURSES

- 200A-200B. Seminar in Food Technology. (1-1) Yr.
The Staff (Mr. Mackinney in charge fall semester,
 Mr. Joslyn in charge spring semester)
- 237A-237B. Research in Food Technology. (1-9; 1-9) Yr.
The Staff (Mr. Joslyn in charge)

FORESTRY

(For courses in Forestry, see page 317)

GENETICS

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 have received credit for Zoölogy 114.

101. *Cytogenetics*. (3) II. Mr. Clausen
 Prerequisite: Genetics 100 and general cytology.
 Genetics as related to cytological conditions, with particular reference to plant materials. Genetics 101C may be taken concurrently.
- 101C. *Cytogenetics Laboratory*. (2) II. Mr. S. W. Brown, Mr. D. R. Cameron
 Prerequisite: Genetics 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: Genetics 100, or equivalent.
 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. S. W. Brown
 Prerequisite: Genetics 100 and Chemistry 8, or their equivalents. Recommended: general cytology.
 An introduction to biochemical and physiological genetics.
105. *Population Genetics*. (3) II. Mr. Lerner, Mr. Dempster
 Lectures and laboratory.
 Prerequisite: Genetics 102.
 A study of the genetic forces operating in artificial selection. Discussion and formulation of breeding plans on the basis of the principles of population genetics with special reference to animals.
199. *Special Study for Advanced Undergraduates*. (1-5) I and II.
The Staff (Mr. Clausen in charge)

GRADUATE COURSES

- 200A-200B. *Research in Genetics*. (1-6; 1-6) Yr.
The Staff (Mr. Clausen in charge)
- 201A-201B. *Staff Seminar in Genetics*. (No credit) Yr.
The Staff (Mr. Clausen in charge)
 Weekly meeting for the presentation of special topics by members of the staff, visiting investigators, and graduate students.
- 202A-202B. *Graduate Seminar in Genetics*. (1-4; 1-4) Yr.
The Staff (Mr. Clausen in charge)
 Prerequisite: graduate standing in genetics.
 Intensive study of special topics in genetics, under supervision of members of the staff.

HOME ECONOMICS

(For courses in Home Economics, see page 344)

HORTICULTURE

(See Pomology, pages 161 and 176)

LANDSCAPE ARCHITECTURE

- 1A-1B. Elementary Design and Theory. (3-3) Yr.
Lectures and laboratory. Mr. Litton, Mr. Vaughan
Prerequisite: Architecture 1 or equivalent, and consent of the instructor.
1A: Mr. Vaughan; 1B: Mr. Litton.
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 equivalents
are prerequisite to all upper division courses in landscape architecture.

- 101A-101B. Intermediate Design and Theory. (3-3) Yr.
Lecture and laboratory. Mr. Litton, Mr. Vaughan
101A: Mr. Vaughan; 101B: Mr. Litton.
Specific problems in the design of residential homesites, parks, and
general public areas.
- 111A-111B. Landscape Design and Construction. (4-4) Yr. Mr. Laffin
Lecture, laboratory, and field trips.
Problems of design and construction with special reference to grading,
retaining walls, steps, pools, garden structures, fences, irrigation, and
drainage systems; reports and estimates.
- 112A-112B. Plant Materials and Planting Design. (3-3) Yr. Mr. Shepherd
Lecture, laboratory, and field trips.
The form, habit, texture, and adaptation of coniferous, deciduous, and
evergreen shrubs, broadleaf and coniferous trees.
- 113A-113B. Plant Materials and Planting Design. (3-3) Yr. Mr. Shepherd
Lecture, laboratory, and field trips.
The form, habit, and adaptation of alpiners, succulents, palms, tropical
plants, natives, vines, and deciduous trees.
- 114A-114B. Advanced Design and Theory. (4-4) Yr.
Lecture and laboratory. Mr. Vaughan, Mr. Litton
Prerequisite: Landscape Architecture 101A-101B.
114A: Mr. Litton; 114B: Mr. Vaughan.
Specific problems of design and construction in large areas.
115. Park and Recreation Area Planning. (4) I. Mr. Violich
(Formerly numbered 115A-115B.)
Lecture and laboratory.
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. 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 the 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.

PLANT BIOCHEMISTRY

123. Plant Biochemistry Laboratory. (2) I. Mr. Delwiche, Mr. Hassid
 (Formerly Botany 123.)
 Prerequisite: Chemistry 5 and 8; Biochemistry 102 taken concurrently.
 Introduction to methods of studying the properties and behavior of plant constituents with special emphasis on quantitative procedures.

GRADUATE COURSES

- 201A-201B. Research in Plant Biochemistry. (1-9; 1-9) Yr.
Mr. Barker, Mr. Delwiche, Mr. Hassid, Mr. Stumpf
 Prerequisite: graduate standing and consent of the instructor.
- 203A-203B. Seminar in Plant Biochemistry. (1-1) Yr.
Mr. Barker, Mr. Delwiche, Mr. Hassid, Mr. Stumpf
 (Formerly Plant Nutrition 203A-203B.)
 Prerequisite: graduate standing and consent of the instructor.

PLANT NUTRITION

115. The Nutrition of Green Plants. (2) I. Mr. Arnon
 (Formerly Soil Science 115.)
 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; Plant Nutrition 115 (taken concurrently if possible).
 Laboratory and greenhouse experiments in plant nutrition to accompany Plant Nutrition 115.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. Stout (in charge), Mr. Arnon, Mr. Bodman, Mr. Bennett,
 Mr. Jacobson, Mr. Jenny, Mr. Overstreet
 Prerequisite: senior standing and consent of the major adviser.

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.)

* Not to be given, 1951-1952.

GRADUATE COURSES

- 201A-201B. Research. (1-9; 1-9) Yr.
Mr. Arnon, Mr. Bennett, Mr. Bodman, Mr. Jacobson,
Mr. Jenny, Mr. Overstreet, Mr. Stout
Prerequisite: graduate standing and consent of the instructor.
Research on problems of plant nutrition and plant physiology.
206. Seminar in Plant Physiology. (1) I.
Mr. Stout (in charge), Mr. Arnon, Mr. Bennett, Mr. Jacobson,
Mr. Machlis, Mr. Mackinney, Mr. Overstreet, Mr. Stone,
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)

PLANT PATHOLOGY

100. Forest Pathology. (3) II. Mr. H. N. 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. MacLean
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 Pathology. (2) II.
Laboratory. Mr. Rawlins, Mr. Ark, Mr. Takahashi
Prerequisite: Plant Pathology 120.
(A) Phytopathological, microbiological, and histological technique. (B)
Application of histochemical methods to the study of diseased plant tissues;
photography; virus technique.
May be repeated once without duplication of credit (maximum, 4 units).
Part (A) to be given in the spring semester of 1952.
123. Principles of Plant Pathology. (2) II. Mr. Thomas, Mr. Wilhelm
Prerequisite: Plant Pathology 120.
A consideration of some of the principles broadly applicable to fungus,
bacterial, virus, and nutritional diseases of plants.
- *125. Diseases of Truck and Field Crops. (2) I.
Laboratory. Mr. M. W. Gardner, Mr. Snyder
Prerequisite: Plant Pathology 120.
The pathology of important crop plants. Dissemination, factors influ-
encing inception and severity of disease, diagnosis, host reaction, etiology,
control.
Given in the fall semester of even-numbered years.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. M. W. Gardner, Mr. Snyder, Mr. H. N. Hansen, Mr. MacLean,
Mr. Rawlins, Mr. Takahashi, Mr. Thomas, Mr. Ark, Mr. Yarwood,
Mr. Wilhelm

* Not to be given, 1951-1952.

GRADUATE COURSES

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr.
The Staff (Mr. Snyder in charge)
- 230A-230B. Research in Plant Pathology. (1-9; 1-9) Yr.
Mr. M. W. Gardner, Mr. H. N. Hansen, Mr. MacLean, Mr. Rawlins,
Mr. Snyder, Mr. Takahashi, Mr. Thomas, Mr. Ark, Mr. Yarwood,
Mr. Wilhelm

POMOLOGY

2. Fruit Growing. (3) I. Mr. Griggs
Prerequisite: Botany 1 or 12.
The principles and practices of fruit growing.

POULTRY HUSBANDRY

1. Poultry Production. (3) I. Mr. Grau
Lectures and laboratory.
An introductory study of the relation of the several sciences underlying poultry production to flock management.
102. Experimental Incubation. (3) II. Mr. L. W. Taylor
Lectures and laboratory.
Prerequisite: Zoölogy 100 or equivalent, and Chemistry 8.
Problems of embryonic development, causes of embryonic mortality in poultry, and principles of artificial incubation.
103. Poultry Breeding. (3) I. Mr. L. W. Taylor, Mr. Lerner
Prerequisite: Genetics 100.
Inheritance in poultry and study of the application of genetic principles to problems in poultry breeding.
104. Poultry Feeds and Feeding. (3) I. Mr. Grau, Mr. D. W. Peterson
Lectures and laboratory.
Prerequisite: Poultry Husbandry 106, completed or in progress.
A study of the manufacture, composition, and use of poultry feedstuffs; elementary feed analysis.
106. Principles of Animal Nutrition. (3) I.
Mr. Lepkovsky, Mr. D. W. Peterson
Prerequisite: Chemistry 8, Zoölogy 1B. Recommended: Physiology 1 and 1L or Animal Husbandry 110.
Not open to students who have had Animal Husbandry 101 at Davis.
The fundamentals of metabolism, maintenance, growth, and reproduction; chemistry and digestion of the proteins, carbohydrates, and fats; functions of minerals, vitamins, and water.
This course may be elected in the Animal Science Curriculum on the Berkeley campus to meet biochemistry requirements.
198. Directed Group Study. (1-2) II. Mr. L. W. Taylor
Prerequisite: senior standing and consent of the 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. Grau in charge)
Prerequisite: Poultry Husbandry 1, courses basic to the problems elected, and consent of the instructor.
Problems may be elected relating to the nutrition, breeding, incubation, physiology, or egg and meat quality of chickens.

Poultry Farm Finance. (See Agricultural Economics 110.)

Poultry Farm Organization and Administration. (See Agricultural Economics 118 and 119.)

Marketing Poultry Products. (See Agricultural Economics 101A, 101B, 104, and 199.)

GRADUATE COURSE

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

Mr. Grau, Mr. Lepkovsky, Mr. Lerner, Mr. D. W. Peterson,
Mr. L. W. Taylor

SOIL SCIENCE

No student will be accepted as a major student in soil science who has not attained an average grade of at least C in each of the fields of required courses in chemistry, physics, botany, bacteriology, and the geological sciences.

100. Soil Characteristics. (4) I. Mr. Bodman, 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 and chemical properties of the soil.
101. Development and Morphology of Soils. (3) II. Mr. Jenny
Prerequisite: Geology 1, Chemistry 1A-1B. Recommended: Soil Science 100.
Influence of climate, vegetation, parent material, topography, and time on soil development; chemistry of soil formation; classification of soils; relationships between soil groups and agricultural use; developed and illustrated by a critical study of representative soils of the world.
- 101F. Development and Morphology of Soils. (1) II. Mr. Crocker
Field trips.
Prerequisite: Soil Science 101 should be taken concurrently.
Excursions on Saturdays to illustrate facts and principles discussed in Soil Science 101.
102. Soil Physics. (2) II. Mr. Bodman
Prerequisite: Soil Science 100; calculus (Mathematics 3A-3B, 16A-16B, or 11A-11B). Recommended: physical chemistry. Soil Science 102L should be taken concurrently.
The physical properties of soils and their measurement.
- 102L. Soil Physics. (2) II. Mr. Day, Mr. Bodman
Laboratory.
Prerequisite: Soil Science 102 (may be taken concurrently).
Laboratory experiments designed to accompany Soil Science 102.
103. Soils of California. (3) I. Mr. Storie
Lectures and discussion section. Two field trips during the semester to be arranged.
Prerequisite: Geology 1, Chemistry 1A-1B.
The general character, mode of formation, classification, geography, use, and conservation of the soil resources of the State. Practice in identifying, rating, and judging the probable value of the important soils in California for agricultural, grazing, and forest use.

105. Summer Field Course. (6) Mr. Storie
 Six weeks, daily.
 Prerequisite: Soil Science 100 and 101 or 103, and approval of instructor in charge.
 Study of soil characteristics, development, and morphology of soils. 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, and 8. Recommended: Geology 1.
 Composition and properties of soils; factors determining productivity; the causes and effects of the soil's reaction, with particular reference to "acid" and "alkali" soils; the nature of fertilizers and some of their effects upon soil and plant; current theory of the soil solution.
111. Soil Microbiology. (2) II. Mr. McLaren
 Prerequisite: Chemistry 5 and 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
 Prerequisite: Soil Science 110 and Chemistry 5.
 Soil conditions as phenomena and in relation to factors influencing fertility; liquid and solid phases of the soil, including absorption phenomena, cation exchange, and buffer effects.
113. Soil Chemistry in Relation to Plant Growth. (2) II.
 Laboratory. Mr. Overstreet, Mr. Stout
 Prerequisite: Chemistry 5, Soil Science 112 (to be taken concurrently).
114. Properties of Colloids. (3) II. Mr. Jenny
 Prerequisite: a course in physical chemistry.
 Properties of colloidal systems of importance in agriculture and biology. Chemistry and physics of surfaces (adsorption, ion interchange), electric double layer, flocculation, Brownian movement, colloid optics, viscosity, swelling.
116. Soil Management. (2) I. Mr. Bodman in charge
 Prerequisite: senior standing in soil science.
 Evaluation of soil fertility by field experiments; use of fertilizers; cultivation practices; aspects of soil erosion control. Lectures, discussions, and demonstrations by various specialists.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Bodman, Mr. Arnon, Mr. Crocker, Mr. Day, Mr. L. E. Davis,
 Mr. Jenny, Mr. Overstreet, Mr. Storie, Mr. Stout
 Open only to student with an average grade of at least B, and subject to the approval of the undergraduate adviser in soil science.
- The Nutrition of Green Plants. (See Plant Nutrition 115.)
 Plant Biochemistry Laboratory. (See Plant Biochemistry 123.)

GRADUATE COURSES

- 201A-201B. Research in Soil Science. (1-9; 1-9) Yr.
 Mr. Arnon, Mr. Bodman, Mr. Crocker, Mr. L. E. Davis, Mr. Jenny,
 Mr. McLaren, Mr. Overstreet, Mr. Stout, Mr. Day

235. Seminar. (1) I.

Mr. Jenny

Prerequisite: graduate standing in soil science, plant physiology, or related subjects.

236A-236B. Staff Seminar in Soil Science. (No credit) Yr.

The Staff

SUBTROPICAL HORTICULTURE

For announcement of courses in this field, see the PROSPECTUS OF THE COLLEGE OF AGRICULTURE or the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES.

TRUCK CROPS

*1. Vegetable Production. (3) II.

Mr. MacGillivray

Principles involved in vegetable production; survey of the vegetable industry.

(GIVEN AT DAVIS)

AGRICULTURAL CHEMISTRY**GRADUATE COURSES**

200A-200B. Seminar in Agricultural Chemistry. (1-1) Yr.

The Staff (Mr. Young in charge)

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

The Staff (Mr. Reiber in charge)

AGRICULTURAL ECONOMICS

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

The Staff (Mr. Hedges in charge)

101A. Principles of Marketing Agricultural Products. (3) I.

Mr. Foytik

101B. Coöperation in Agriculture. (3) I.
(Formerly numbered 2.)

Mr. Tinley

103. Agriculture in the American Economy. (3) II.

Mr. Brekke

118. Farm Organization. (3) I and II.

Mr. Hedges, Mr. Sitton

119. Farm Management. (3) II.

Mr. Robinson

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

The Staff (Mr. Hedges in charge)

AGRICULTURAL ENGINEERING

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

_____, Mr. Bainer

14A-14B. Farm Mechanics for Teachers. (2-2) Yr.

Mr. M. O'Brien

49. Summer Field Practice. (6)

The Staff (Mr. Perry in charge)

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

Mr. S. M. Henderson

103. Agricultural Power. (3) II.

Mr. Lamouria

104. Agricultural Machinery. (3) I.

Mr. R. A. Kepner, Mr. Akesson

105. Farm Structures. (3) I.

Mr. Neubauer

* Not to be given, 1951-1952.

106. Heat Transfer in Agricultural Climatic Environment. (2) II.
Mr. F. A. Brooks
107. Problems in Teaching Farm Mechanics. (3) I and II. Mr. M. O'Brien
- †113. Agricultural Power. (4) II. Mr. Lorenzen
- †114. Agricultural Machinery. (3) I. Mr. Bainer, Mr. R. A. Kepner
- †115. Farm Structures Design. (3) I. Mr. Neubauer
- †130. Proseminar. (1) II. Mr. F. A. Brooks, Mr. Bainer
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Bainer in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Bainer in charge)

GRADUATE COURSE

- 299A-299B. Research in Agricultural Engineering. (1-6; 1-6) Yr.
Mr. F. A. Brooks, Mr. Akesson, Mr. Bainer, Mr. Boelter, Mr.
S. M. Henderson, Mr. Howe, Mr. Huberty, Mr. Johnston, Mr.
Joslyn, Mr. R. A. Kepner, Mr. Lorenzen, Mr. Neubauer,
Mr. Perry, Mr. Powers, Mr. Veihmeyer, Mr. Young
(Formerly numbered 200A-200B.)

AGRONOMY*

1. Introduction to Agronomy. (3) I. Mr. Smeltzer, Mr. Mikkelsen
110. Principles of Crop Production. (3) I. Mr. Laude
111. Field Crops. (3) I. Mr. Stanford
112. Forage Crops. (3) II. Mr. M. L. Peterson
114. Plant Breeding. (3) II. Mr. Briggs
115. Range Plants and Management. (3) II. Mr. Love
130. Quantitative Inheritance in Plant Breeding. (3) I. Mr. Allard
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Briggs in charge)

GRADUATE COURSE

- 200A-200B. Research in Agronomy. (1-6; 1-6) Yr.
Mr. Briggs, Mr. Allard, Mr. Conrad, Mr. Knowles, Mr. Laude, Mr.
Love, Mr. Madson, Mr. Mikkelsen, Mr. M. L. Peterson, Mr.
Schaller, Mr. Smeltzer, Mr. F. L. Smith, Mr. Stanford, Mr.
Zscheile

ANIMAL HUSBANDRY

7. Introduction to Animal Husbandry. (3) I. Mr. Heitman
8. Livestock Judging and Selection. (1) I. Mr. Carroll, Mr. Meyer
101. Animal Biochemistry. (3) II. Mr. Goss

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

* See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE for list of related courses in other divisions.

102. Animal Biochemistry Laboratory. (2) I and II.
Mr. Lofgreen, Mr. Carroll, Mr. Meyer
103. Animal Nutrition—Feeds and Feeding. (3) I. Mr. Weir
107. Breeding Farm Animals. (2) II. Mr. Cupps, Mr. Gregory
108. Milk Production. (4) II. Mr. Mead, Mr. Cupps
110. Physiology of Domestic Animals. (5) I. Mr. H. H. Cole, Mr. Cupps
111. Advanced Livestock Judging. (2) I. Mr. Heitman, Mr. Carroll
112. Advanced Dairy Cattle Production. (2) I.
Mr. Mead, Mr. Laben, Mr. Cupps
113. Wool Technology. (3) I. Mr. J. F. Wilson
115. Horse Production. (3) II. Mr. Howell
118. Meat Production. (4) II.
Mr. Guilbert, Mr. Heitman, Mr. Weir, Mr. Carroll
120. Advanced Animal Nutrition. (3) I. Mr. Kleiber
125. Population Genetics. (3) II. Mr. Rollins
130. Physiology of the Endocrine Glands. (3) II. Mr. H. H. Cole
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (——— in charge)

Animal Parasites and Diseases. (See Veterinary Science 111 and 112.)

GRADUATE COURSES

- 200A-200B. Research in Animal Husbandry, Animal Nutrition, Animal Physiology, or Animal Genetics. (1-6; 1-6) Yr.
Mr. Carroll, Mr. H. H. Cole, Mr. Cupps, Mr. Goss, Mr. Gregory, Mr. Guilbert, Mr. Heitman, Mr. Howell, Mr. Kleiber, Mr. Laben, Mr. Lofgreen, Mr. Mead, Mr. Meyer, Mr. Rollins, Mr. Weir, Mr. J. F. Wilson
- 201A-201B. Seminar in Animal Nutrition, Animal Physiology, or Animal Genetics. (1-1) Yr.
The Staff (——— in charge)

BACTERIOLOGY

1. Introductory Bacteriology and Microbiology. (5) II.
Mr. Starr, Mr. Reynolds
2. General Bacteriology. (4) I. Mr. Mudge
103. Microbial Metabolism. (2) I. Mr. Starr
105. Technical Microbiology. (3) II. Mr. Reynolds
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. Mudge, Mr. Reynolds, Mr. Starr

GRADUATE COURSES

200. Research in Bacteriology. (1-6) I and II.
Mr. Mudge, Mr. Reynolds, Mr. Starr
- 201A-201B. Seminar in Bacteriology and Microbiology. (1-1) Yr.
Mr. Mudge, Mr. Reynolds, Mr. Starr

BOTANY

1. General Botany. (5) I and II.
Mr. Weier, Mr. Gifford, Mr. Stocking, Mr. Tucker
7. Introduction to Plant Physiology. (4) II. Mr. Stocking
8. Poisonous Plants. (2) II. Mr. Tucker
14. Structure and Reproduction of the Thallophytes and Bryophytes. (4) II.
(Formerly numbered 2.) Miss Esau
16. Comparative Morphology of Vascular Plants. (4) I. Mr. Gifford
(Formerly numbered 106.)
105. Plant Anatomy. (4) I. Miss Esau
107. Weed Control. (4) II. Mr. Crafts
108. Systematic Botany of Seed Plants. (3) II. Mr. Tucker
- 120A-120B. Plant Physiology. (2-2) Yr. Mr. Currier
- 121A-121B. Plant Physiology Laboratory. (2-2) Yr. Mr. Currier
130. Plant Cytology. (4) I. Mr. Weier
131. Chromosome Techniques. (2) II. Mr. Weier
155. Microscopic Technique. (2) I. Mr. Gifford
(Formerly numbered 100D.)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (——— in charge)

GRADUATE COURSES

- 200A-200B. Research in Botany. (1-6; 1-6) Yr.
The Staff (——— in charge)
203. Seminar in Plant Physiology. (1) I and II.
Mr. Crafts, Mr. Currier, Mr. Stocking
208. Seminar in Plant Morphology. (1) II.
Miss Esau, Mr. Gifford, Mr. Tucker, Mr. Weier

BUSINESS ADMINISTRATION

- 1A. Principles of Accounting. (3) I. Mr. Foytik

CHEMISTRY

- 1A-1B. General Chemistry. (5-5) Yr. Beginning each semester.
Mr. Young, Mr. Andrews, Mr. Brinton, Mr. Keefer, Mr. R. E. Kepner, Mr. Painter, Mr. Reiber, Mr. Volman
5. Quantitative Analysis. (3) I and II. Mr. Brinton
8. Short Survey of Organic Chemistry. (3) I and II.
I: Mr. Reiber; II: Mr. Andrews. Mr. Reiber, Mr. Andrews
9. Methods of Organic Chemistry. (3) I. Mr. Painter
- 12A-12B. General Organic Chemistry. (5-5) Yr.
Mr. Andrews, Mr. R. E. Kepner
12A: Mr. Andrews; 12B: Mr. R. E. Kepner.

101. General Biochemistry. (3) II. Mr. Painter
 102. Biochemistry Laboratory. (2) II. Mr. Painter
 105. Advanced Quantitative Analysis. (3) II. Mr. Brinton
 109. Physical Chemistry, Brief Course. (3) II. Mr. Young
 110A-110B. Physical Chemistry. (3-3) Yr. Mr. Keefer, Mr. Volman
 *111. Physical Chemistry. (3) I. Mr. Keefer
 113. Chemistry of Colloids. (3) I. Mr. Volman
 114H. Physical Chemistry—Thermodynamics. (3) I. Mr. Young
 151. Advanced Plant Biochemistry. (2) I. Mr. Zscheile
 152. Advanced Plant Biochemistry Laboratory. (2) II. Mr. Zscheile
 180H. Undergraduate Research. (2-5) I and II.
 The Staff (Mr. Young in charge)
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Young in charge)

GRADUATE COURSE

280. Research. (2-9) I and II. The Staff (Mr. Young in charge)

DAIRY INDUSTRY

1. Principles of Dairying. (3) I. Mr. Jack
 2. Laboratory in Principles of Dairying. (1) I. Mr. Tarassuk
 49. Summer Practice and Observation Course. (No credit)
 The Staff (Mr. Hubbell in charge)
 101A-101B. Dairy Products. (5-5) Yr.
 Mr. Phillips, Mr. Dunkley, Mr. Nickerson
 101A: Mr. Dunkley; 101B: Mr. Nickerson, Mr. Phillips.
 106. Chemistry of Milk and Dairy Products. (4) II. Mr. Tarassuk
 107A-107B. Laboratory Control for Dairy Plants. (2-2) Yr. Mr. Collins
 (Formerly numbered 107.)
 142. Dairy Bacteriology. (3) I. Mr. Collins
 160A-160B. Proseminar. (1-1) Yr. The Staff (Mr. Jack in charge)
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Jack in charge)

GRADUATE COURSES

- 200A-200B. Research in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology. (1-6; 1-6) Yr.
 The Staff (Mr. Jack in charge)
 201A-201B. Seminar in Dairy Technology, Dairy Chemistry, and Dairy Bacteriology. (1-1) Yr.
 The Staff (Mr. Jack in charge)

DECORATIVE ART

(For courses in Decorative Art, see Home Economics, page 172)

ECONOMICS

- 1A. Principles of Economics. (3) I and II. Mr. Hedges, Mr. Haff
 1B. Principles of Economics. (3) II. Mr. Brekke
 199. Special Study for Advanced Undergraduates. (1-3) I and II. ———

EDUCATION

110. Introduction to Educational Psychology. (3) I and II. Miss Johnson
 160. Vocational Education. (2) I and II. Mr. Juergenson, Mr. Sutherland
 †161. Problems in Vocational Education. (2) I and II. Mr. Sutherland
 164. Introduction to Student Personnel Work. (2) I and II. Mr. Bursch
 170. Secondary Education. (2) I and II. Miss Johnson
 198. Directed Group Study of Agricultural Education. (2) I and II.
 The Staff (Mr. Sutherland in charge)
 199. Special Study for Advanced Undergraduates in Agricultural Education.
 (1-5) I and II. The Staff (Mr. Sutherland in charge)

GRADUATE COURSE

- 260A-260B. Vocational Education Seminar. (2-2) Yr.
 Mr. Griffin, Mr. Sutherland

SUPERVISED TEACHING COURSES

- †320A. Introduction to Teaching. (1) I and II.
 Mr. Sutherland, Miss Johnson, Mr. Juergenson
 †320B. Audio-Visual, Radio, and Other Instructional Resources. (2) I and II.
 Mr. Juergenson
 †320C. Supervised Teaching. (3) I and II.
 Mr. Sutherland, Mr. Juergenson, Miss Johnson, Mr. Bursch
 †320E. Methods of Teaching. (2) I and II.
 Mr. Sutherland, Mr. Juergenson, Miss Johnson
 Sec. 1. Agriculture. Mr. Sutherland, Mr. Juergenson; Sec. 11. Home-
 making. Miss A. Johnson.
 †323. Practicum in Supervised Teaching. (2-4) I and II.
 Mr. Sutherland, Miss Johnson

ENGINEERING

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

ENGLISH

- 1A-1B. Reading, Composition, and Speech. (3-3) Yr. Beginning each semester.
 Mr. Fishman, Miss Van Norden, Mrs. Wright, Mr. Hanzo,
 Mrs. Homann, Mrs. Needham, Mr. Wiggins
 44A-44B. Masterpieces of Literature. (3-3) Yr. Mr. Fishman
 46A-46B. Survey of English Literature. (3-3) Yr.
 Mrs. Homann, Miss Van Norden

† Open only to apprentice teachers and graduate students.

100. Methods and Materials of Literary Criticism. (3) II. Mr. Fishman
 106L. Advanced Composition. (3) I. Miss Van Norden
 *114A. The English Drama to 1642. (3) I. _____
 117A-*117B. Shakespeare. (3-3) Yr. Mrs. Wright, _____
 117A: Mrs. Wright; 117B: _____
 125C-125D. The Novel. (3-3) Yr. Mrs. Needham
 130C. American Literature: 1885 to the Present. (3) II. Mrs. Wright
 151L. Chaucer. (3) I. Mrs. Homann
 157. The Age of Milton. (3) II. Miss Van Norden

ENTOMOLOGY AND PARASITOLOGY

100. General Entomology. (4) II. Mr. Bohart
 (Formerly numbered 1.)
 105. Apiculture. (4) II. Mr. Eckert
 106. Insect Morphology and Histology. (4) I. Mr. Laidlaw, Jr., Mr. Summers
 107. Queen Bee Rearing. (4) II. Mr. Laidlaw, Jr.
 112. Systematic Entomology. (4) I. Mr. Bohart
 124. Economic Entomology. (4) I. Mr. L. M. Smith, Mr. Lange
 127. Insect Ecology. (3) II. Mr. Bailey
 128. Insect Toxicology. (4) II. Mr. Stafford
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Bailey, Mr. Bohart, Mr. Douglas, Mr. Eckert, Mr. Laidlaw, Jr.,
 Mr. Lange, Mr. L. M. Smith, Mr. Stafford, Mr. Summers

GRADUATE COURSES

- 200A-200B. Research in Entomology and Parasitology. (1-6; 1-6) Yr.
 The Staff (Entomology, Mr. Bailey in charge; Parasitology,
 Mr. Douglas in charge)
 (Formerly numbered 201A-201B.)
 201A-201B. Seminar in General Entomology. (1-1) Yr.
 The Staff (Mr. Bailey in charge)

FOOD TECHNOLOGY

112. Principles and Practices of Food Processing. (3) I. Mr. Marsh
 113. Chemical and Biochemical Aspects of Food Processing. (3) II.
 Mr. Mrak, Mr. Phaff
 *114. Principles of Food Processing Operations. (4) I. Mr. Marsh
 *115. Food Analysis. (4) II. Mr. Joslyn
 *116. Yeasts and Related Organisms. (4) II. Mr. Mrak, Mr. Phaff

* Not to be given, 1951-1952.

- *117. Food Microbiology. (4) I. Mr. Vaughn
 119. Microscopy of Food Materials. (3) II. Mr. Sterling
 *120. The Natural Coloring Matters. (3) I. Mr. Mackinney
 *127. Recent Advances in Food Technology. (1) I and II. Mr. Mrak
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Mrak in charge)

GRADUATE COURSES

- 200A-200B. Seminar in Food Technology. (1-1) Yr. Mr. Marsh
 237A-237B. Research in Food Technology. (1-9; 1-9) Yr.
 The Staff (Mr. Mrak in charge)

FRENCH

1. Elementary French—Beginning. (4) I and II.
 Miss Van Norden, Mr. Nelson
 2. Elementary French—Continued. (4) I and II. Mr. Nelson, Mr. Puknat

GENETICS

100. Principles of Genetics. (4) I and II. Mr. Green, Mr. Stebbins
 I: Mr. Green; II: Mr. Stebbins.
 103. Organic Evolution. (3) I. Mr. Stebbins
 106. Advanced Genetics. (3) II. Mr. Green
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 I: Mr. Green; II: Mr. Stebbins. Mr. Green, Mr. Stebbins
 Population Genetics. (See Animal Husbandry 125.)

GRADUATE COURSES

- 200A-200B. Research in Genetics. (1-6; 1-6) Yr.
 Mr. Asmundson, Mr. Briggs, Mr. Clausen, Mr. Gregory, Mr. Love,
 Mr. Olmo, Mr. Rick, Mr. Rollins, Mr. Stebbins
 201A-201B. Staff Seminar in Genetics. (No credit) Yr.
 The Staff (Mr. Briggs in charge)

GEOLOGY

1. General Geology—Dynamical and Structural. (3) II. Mr. Higgins

GERMAN

1. Elementary German—Beginning. (4) I. Mrs. Wright
 2. Elementary German—Continued. (4) II. Mr. Puknat
 *3. Intermediate German. (4) I. Mr. Puknat
 1G. German for Graduate Students. (No credit) II. Mr. Puknat

HISTORY

- 4A-4B. History of Europe. (3-3) Yr. Mr. C. B. O'Brien
 17A-17B. History of the United States. (3-3) Yr. Mr. Puryear

* Not to be given, 1951-1952.

101. Introduction to Historical Method and Bibliography. (3) I. Mr. Puryear
- 136A-136B. History of Russia and Poland Since the Crimean War. (3-3) Yr. Mr. C. B. O'Brien
148. Recent World History. (3) II. Mr. Puryear
- 151A-151B. History of England, from 1485 to the Present. (3-3) Yr. Mr. C. B. O'Brien
- 151A. Tudor and Stuart England and the Empire, 1485-1714.
- 151B. History of Great Britain Since 1714.
- 161A-161B. Hispanic-American History. (3-3) Yr. _____
- 161A. Colonial History of Latin America.
- 161B. The National Period of Latin-American History.
- 171A-171B. History of the United States. (3-3) Yr. Mr. Puryear
- 174B. Recent History of the United States. (3) I. Mr. Shideler
185. Government and Agriculture of the United States. (3) II. _____
- 188A-188B. History of Agriculture in the Americas. (2-2) Yr. Mr. Shideler
- 189A-189B. History of California and the Pacific Coast. (3-3) Yr. _____
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Puryear in charge)

GRADUATE COURSE

298. Directed Research. (2-4) I and II. The Staff (Mr. Puryear in charge)

HOME ECONOMICS

(For courses offered at Davis, see under Home Economics, page 344)

HORTICULTURE

(See Pomology, Truck Crops, Viticulture)

IRRIGATION

100. Principles Underlying Irrigation in Its Soil and Plant Relationships. (4) II. Mr. Hagan
110. Irrigation Principles and Practices. (4) I. Mr. D. W. Henderson
115. Water Quality and Salinity as Factors in Irrigation. (3) I. Mr. Doneen
119. Basic Irrigation Hydraulics. (3) II. Mr. Scott
120. Applied Irrigation Hydraulics. (3) I. Mr. Johnston
125. Water Supply and Surface Hydrology. (3) I. Mr. Burgy
130. Ground Water, Wells, and Pumping Plants. (3) II. Mr. Scott
140. Drainage in Relation to Irrigation. (3) I. Mr. Luthin
150. Irrigation Institutions. (3) II. _____
160. Land Preparation and Irrigation Systems. (4) II. Mr. Marr
190. Irrigation Proseminar. (1) II. The Staff (Mr. Veihmeyer in charge)

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

GRADUATE COURSE

201A-201B. Research in Irrigation. (1-6; 1-6) Yr.
The Staff (Mr. Veihmeyer in charge)

LANDSCAPE GARDENING

3. Planning the Home Grounds. (3) II. Mr. Jones
4. Landscape Design and Construction. (2) I. Mr. Jones
7. General Floriculture. (3) II. Mr. Carrier

MATHEMATICS

C. Trigonometry. (3) I and II. The Staff
D. Intermediate Algebra. (3) I and II. The Staff
G. Solid Geometry. (2) I. Mr. Fulton
1. College Algebra. (3) I and II. The Staff
3A. Analytic Geometry and Calculus, First Course. (3) I and II.
Mr. Alder, Mr. Fulton
3B. Analytic Geometry and Calculus, Second Course. (3) I and II.
Mr. Hayes, Mr. Fulton
4A. Analytic Geometry and Calculus, Third Course. (3) I and II.
Mr. Burdette, Mr. Hayes
4B. Analytic Geometry and Calculus, Fourth Course. (3) I and II.
Mr. Norton, Mr. Burdette
8. Theory of Algebraic Equations. (3) II. Mr. Burdette, Mr. Hayes
9. Introduction to Projective Geometry. (3) II. Mr. Fulton
*10. Spherical Trigonometry. (2) I. _____
11A-11B. Analytic Geometry and Calculus. (3-3) Yr.
Mr. Burdette, Mr. Hayes, Mr. Arnold
13. Elementary Statistics. (3) I and II. The Staff
105. Statistical Methods for Biologists. (3) II.
Mr. Roessler, Mr. G. A. Baker
110A-110B. Advanced Engineering Mathematics. (2-2) Yr. Mr. Burdette
111A. Algebra. (3) I. Mr. Alder, Mr. Norton
112B. Metric Differential Geometry. (3) II. Mr. Arnold, Mr. Fulton
119A-119B. Differential Equations. (3-3) Yr. Mr. Burdette, Mr. Hayes
128. Numerical Analysis. (3) II. Mr. Arnold
130A-130B. Statistical Inference. (3-3) Yr. Mr. G. A. Baker
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Roessler in charge)

* Not to be given, 1951-1952.

GRADUATE COURSES

290. Seminars in Mathematics. (2-6) I and II.
The Staff (Mr. Roessler in charge)
295. Research in Mathematics. (2-6) I and II.
The Staff (Mr. Roessler in charge)

MECHANICAL ENGINEERING

151. Industrial Heat Transfer. (3) I. Mr. Perry
- 152A. Industrial Mass Transfer. (3) II. Mr. S. M. Henderson

MILITARY SCIENCE AND TACTICS

- 1A. Basic (First Year). (2) I.
(Formerly numbered 10A.) The Staff
- 1B. Basic (First Year). (2) II.
(Formerly numbered 10B.) The Staff
- 20A. Basic Infantry (Second Year). (2) I.
(Formerly numbered 2A.) The Staff
- 20B. Basic Infantry (Second Year). (2) II.
(Formerly numbered 2B.) The Staff
- 130A-130B. Advanced Infantry (First Year). (4-4) Yr. The Staff
(Formerly numbered 106A-106B.)
- 140A-140B. Advanced Infantry (Second Year). (4-4) Yr. The Staff
(Formerly numbered 107A-107B.)

MUSIC

- 25A-25B. University Band. (1-1) Yr. Beginning each semester.
Mr. McArdell
- 27A-27B. Introduction to Musical Literature. (2-2) Yr. Mr. McArdell
- 35A-35B. University Chorus. (1-1) Yr. Beginning each semester.
Mr. McArdell
- 75A-75B. University Symphony Orchestra. (1-1) Yr. Beginning each
semester. Mr. McArdell

PHYSICAL EDUCATION

1. Physical Education for Men. ($\frac{1}{2}$) I and II.
Mr. Toomey, Mr. Boyer, Mr. Forbes, Mr. Hickey,
Mr. Schall, Mr. Stromgren, Mr. E. S. Wilson
- 5A. First Aid. (1) I and II. Mr. Hickey, Mr. E. S. Wilson, Mr. Stromgren
- 5B. Advanced First Aid. (No credit) I.
Mr. Hickey, Mr. E. S. Wilson, Mr. Stromgren
24. Theory of Teaching of Swimming, Diving, and Water Polo. (1) I and II.
Mr. Hickey
25. The Theory and Teaching of Lifesaving and Water Safety. (1) I and II.
Mr. Hickey
26. Physical Education for Women. ($\frac{1}{2}$) I and II. Miss Welch

PHYSICS

- 2A-2B. General Physics Lectures. (3-3) Yr. Beginning each semester.
Mr. M. E. Gardner, Mr. Patten
- 3A-3B. General Physics Laboratory. (1-1) Yr. Beginning each semester.
Mr. M. E. Gardner, Mr. Patten
- 4A. General Physics (4) II. Mr. M. E. Gardner, Mr. Patten
- 4B. General Physics. (4) I. Mr. M. E. Gardner, Mr. Patten
- 4C. General Physics. (4) II. Mr. M. E. Gardner, Mr. Patten
- 105A-105B. Analytic Mechanics. (3-3) Yr. Mr. Patten
106. Atomic Structure and Structure of Matter. (3) II. _____
- 110A-110B. Electricity and Magnetism. (3-3) Yr. _____
- *112. Heat. (3) I. Mr. Patten
(Formerly numbered 116.)
121. Introduction to Atomic Structure. (3) II. Mr. M. E. Gardner
- *129. Introduction to Electronics. (3) II. Mr. M. E. Gardner
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. M. E. Gardner, Mr. Patten

PHYSIOLOGY

1. Introductory Physiology Lecture. (3) I. Mr. Salt
(Formerly numbered 1A.)
- 1L. Introductory Physiology Laboratory. (2) I. Mr. Salt
(Formerly numbered 1C.)

PLANT NUTRITION

(For courses in Plant Nutrition, see Soil Science)

PLANT PATHOLOGY

120. Plant Diseases. (4) I and II. Mr. Houston, Mr. Grogan
122. Plant Pathology Methods. (2) I. Mr. Hewitt
- 124A-124B. Pathogenic Fungi. (3-3) Yr. Mr. English, Mr. Nyland
- 125A-125B. Diseases of Crop Plants. (2-2) Yr.
Mr. J. B. Kendrick, Mr. Oswald, Mr. E. E. Wilson
- 125A. Field and Truck Crops. Mr. J. B. Kendrick, Mr. Oswald
- 125B. Fruit, Nut, and Vine Crops. Mr. E. E. Wilson
128. Advanced Plant Pathology. (3) II. Mr. Leach
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. J. B. Kendrick, Mr. Leach, Mr. E. E. Wilson, Mr. Hewitt, Mr.
Houston, Mr. Oswald, Mr. English, Mr. Grogan, Mr. Nyland

GRADUATE COURSES

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

* Not to be given, 1951-1952.

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

Mr. J. B. Kendrick, Mr. English, Mr. Grogan, Mr. Hewitt, Mr. Houston, Mr. Leach, Mr. Nyland, Mr. Oswald, Mr. E. E. Wilson

POLITICAL SCIENCE

113. American Political Theory. (3) II. Mr. Shideler
 151. American National Government. (3) I. Mr. Puryear

POMOLOGY

(For courses in grape production, see Viticulture)

2. Fruit Growing. (3) I. Mr. L. D. Davis
 (Formerly Horticulture 2.)
 10. Plant Propagation. (2) II. Mr. Hartmann
 (Formerly Horticulture 10.)
 105. Fruit Handling and Varieties. (3) Summer Course (six weeks).
 (Formerly Horticulture 105P.) Mr. Harris, ——
 106A-106B. Fruit Plants. (2-2) Yr. Mr. Crane, Mr. D. S. Brown
 (Formerly Horticulture 106A-106B.)
 106A: Mr. Crane; 106B: Mr. D. S. Brown.
 107. Small-Fruit Culture. (2) I. Mr. R. E. Baker, Mr. Hesse
 110. Fruit Morphology. (3) I. Mr. R. M. Brooks
 (Formerly Horticulture 110.)
 112. Handling, Storage, and Transit of Fruits. (3) I. Mr. F. W. Allen
 (Formerly Horticulture 112.)
 114. Fruit Breeding. (3) II. Mr. Olmo
 (Formerly Horticulture 114.)
 121. Advanced Pomology. (3) I. Mr. Proebsting
 (Formerly Horticulture 121.)
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. F. W. Allen, Mr. R. E. Baker, Mr. R. M. Brooks, Mr. D. S. Brown,
 Mr. Claypool, Mr. Crane, Mr. L. D. Davis, Mr. Griggs, Mr. C. J.
 Hansen, Mr. Harris, Mr. Hartmann, Mr. Hendrickson, Mr. Hesse,
 Mr. Lilleland, Mr. Proebsting, Mr. Serr, Mr. Tufts
 (Formerly Horticulture 199.)

GRADUATE COURSES

- 201A-201B. Research in Pomology. (1-6; 1-6) Yr.
 Mr. F. W. Allen, Mr. R. E. Baker, Mr. R. M. Brooks, Mr. D. S. Brown,
 Mr. Claypool, Mr. Crane, Mr. L. D. Davis, Mr. Griggs, Mr. C. J.
 Hansen, Mr. Harris, Mr. Hartmann, Mr. Hendrickson, Mr. Hesse,
 Mr. Lilleland, Mr. Proebsting, Mr. Tufts
 (Formerly Horticulture 201A-201B.)
 205A-205B. Seminar. (1-1) Yr. Mr. L. D. Davis
 (Formerly Horticulture 205A-205B.)

POULTRY HUSBANDRY

1. Poultry Production. (3) II. Mr. Asmundson, Mr. F. W. Lorenz
 104. Poultry Feeds and Feeding. (3) I. Mr. Kratzer

107. Avian Physiology. (2) II. Mr. F. W. Lorenz

108. Avian Physiology Laboratory. (1) II.
Mr. A. H. Smith, Mr. F. W. Lorenz

199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. G. F. Stewart in charge)

Poultry Pathology. (See Veterinary Science 111 and 112.)

GRADUATE COURSE

200A-200B. Research in Poultry Husbandry. (1-6; 1-6) Yr.
Mr. G. F. Stewart, Mr. Asmundson, Mr. Kratzer, Mr. F. W. Lorenz,
Mr. A. H. Smith, Mr. W. O. Wilson

PSYCHOLOGY

1A. General Psychology. (3) I. Mr. Bursch

33. Personal and Social Adjustment. (3) II. Mr. Bursch

PUBLIC HEALTH

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

SOIL SCIENCE

106. Elements of Soil Science. (4) II. Mr. L. E. Davis

110. The Soil as a Medium for Plant Growth. (4) I. Mr. Conrad

199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

Irrigation in Its Soil and Plant Relationships. (See Irrigation 100.)

GRADUATE COURSE

200A-200B. Research in Soil Science. (1-6; 1-6) Yr.
Mr. Conrad, Mr. L. E. Davis, Mr. Veihmeyer

SPANISH

1. Elementary Spanish—Beginning. (4) I and II. Mr. Nelson

2. Elementary Spanish—Continued. (4) II. Mr. Nelson

3. Intermediate Spanish. (4) I. Mr. Nelson

SPEECH

1B. Principles and Types of Speech. (3) II. Mrs. Needham

SUBJECT A: ENGLISH COMPOSITION

Subject A. English Composition. (No Credit) I and II.
Mr. Hanzo, Mr. Wiggins

TRUCK CROPS

1. Vegetable Production. (3) II. Mr. MacGillivray

105. Systematic Olericulture. (3) I. Mr. P. G. Smith

112. Handling, Storage, and Transit of Vegetables. (3) I. Mr. Morris

118. Vegetable Seed Production. (2) II. Mr. Harrington

* Not to be given, 1951-1952.

120. Vegetable Breeding. (3) II. Mr. Rick, Mr. Spurr
 121. Vegetable Physiology. (3) II. Mr. Mann, Mr. Pratt
 122. Advanced Truck Crops. (3) I. Mr. O. A. Lorenz
 190. Proseminar. (1) II. Mr. Knott
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Knott in charge)

GRADUATE COURSES

- 200A-200B. Research in Truck Crops. (1-6; 1-6) Yr.
 Mr. Knott, Mr. Crafts, Mr. G. N. Davis, Miss Esau, Mr. Harrington,
 Mr. O. A. Lorenz, Mr. MacGillivray, Mr. Mann, Mr. Morris, Mr.
 Pratt, Mr. Rick, Mr. P. G. Smith, Mr. Spurr, Mr. Yamaguchi
 201A-201B. Seminar in Truck Crops. (1-1) Yr.
 The Staff (Mr. Knott in charge)

VETERINARY SCIENCE

111. Principles of Pathology and Control of Diseases of Domestic Animals.
 (3) II. Mr. H. S. Cameron
 112. Poultry Pathology Laboratory. (1) II. Mr. Douglas
 120. Anatomy of Domestic Animals. (9) I. Mr. Julian, Mr. Osebold
 121. Microbiology. (10) II. Mr. McKercher, Mr. Enright, ——
 122. Comparative Pathology. (10) I. Mr. Cordy, ——
 123. Comparative Pharmacology. (10) II. Mr. Peoples, Mr. Holm
 124. Veterinary Parasitology. (4) II. Mr. Douglas
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Hart in charge)

GRADUATE COURSE

- 200A-200B. Research in Animal Pathology. (1-6; 1-6) Yr.
 The Staff (Mr. Hart in charge)

VETERINARY MEDICINE

GRADUATE COURSES

201. Clinical Pathology. (4) I. Mr. Schalm, Mr. Bankowski
 202. Clinical Pathology. (4) II. Mr. Schalm, Mr. Bankowski
 203. Introductory Medicine. (4) I. Mr. Christensen
 204. Infectious Diseases. (5) II. Mr. Howarth, Mr. Traum
 205. Small-Animal Medicine. (3) II. Mr. Hage, Mr. Redding
 206. Medicine. (4) I. ——, ——
 207. Medicine. (4) II. Mr. Jasper, Mr. Mathey
 220. Introductory Surgery. (3) I. Mr. Wheat, Mr. Woolsey
 221. Surgical Anatomy. (4) II. ——, ——

222. Surgery. (2) II. Mr. Redding
 223. Surgery. (5) I. Mr. Wheat
 230. Reproduction. (3) I. Mr. Hart, Mr. J. W. Kendrick
 235. Therapeutics. (3) I. _____
 240. Veterinary Public Health. (5) II. Mr. Enright
 251A-251B. Clinics. (3-3) Yr. The Staff (Mr. H. S. Cameron in charge)
 252A-252B. Autopsy. (1-1) Yr. Mr. Cordy, _____
 254A-254B. Clinic Conference. (1-1) Yr.
 The Clinic Staff (Mr. H. S. Cameron in charge)
 256A-256B. Clinic Conference. (No credit) Yr.
 The Staff (Mr. H. S. Cameron in charge)
 260. Radiology. (1) I. Mr. Gray
 270A-270B. Jurisprudence. (No credit) Yr. The Staff (Mr. Hart in charge)

VITICULTURE

1. Introduction to Grape and Wine Production. (3) II. Mr. Amerine
 105. Fruit Handling and Varieties. (3) Summer Course (six weeks).
 (Formerly Horticulture 105V.) Mr. Winkler, Mr. Lider
 116. General Viticulture. (4) II. Mr. Winkler, Mr. Weaver
 (Formerly Horticulture 116.)
 *117. Microbiology of Wine Production. (4) I. Mr. Castor
 (Formerly Horticulture 130A-130B.)
 124. Principles and Practices of Enology: Wine Processing and Analyses.
 (4) II. Mr. Amerine
 (Formerly Horticulture 120B.)
 125. Principles and Practices of Enology: Wine Preparation. (4) I.
 (Formerly Horticulture 120A.) Mr. Webb
 140. Unit Operations in Winery Practice and Brandy Production. (4) II.
 (Formerly Horticulture 140 and 141.) Mr. Guymon
 160. Proseminar. (1) I. Mr. Olmo
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Winkler in charge)
 Grape Breeding. (See Pomology 114.)

GRADUATE COURSES

205. Seminar. (1) II. The Staff (Mr. W. O. Williams in charge)
 233A-233B. Research in Viticulture and Enology. (1-6; 1-6) Yr.
 The Staff (Mr. Winkler in charge)

ZOOLOGY

- 1A-1B. General Zoölogy. (4-4) Yr. Mr. Storer, Mr. Miller
 1A: Mr. Storer, Mr. Miller; 1B: Mr. Miller.

* Not to be given, 1951-1952.

10. General Biology. (3) II. Mr. Hildebrand
 100A. Vertebrate Embryology. (2) I. Mr. Hildebrand
 100C. Vertebrate Embryology Laboratory. (2) I. Mr. Hildebrand
 104. Materials and Methods of Animal Micrology. (3) II. Mr. Rosenberg
 106. Comparative Anatomy of the Vertebrates. (4) II. Mr. Hildebrand
 107. Microanatomy. (4) II. Mr. Rosenberg
 110. Protozoölogy. (4) II. Mr. Rosenberg
 112. Invertebrate Zoölogy. (4) II. Mr. Miller
 116. Economic Vertebrate Zoölogy. (3) I. Mr. Storer
 134. Biology of Birds and Mammals. (4) II. Mr. Storer, Mr. Howard
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 The Staff (Mr. Storer in charge)

GRADUATE COURSES

- 200A-200B. Research in Zoölogy. (1-6; 1-6) Yr.
 The Staff (Mr. Storer in charge)
 201. Zoölogy Seminar. (No credit) I and II.
 The Staff (Mr. Rosenberg in charge)

(GIVEN AT RIVERSIDE)

GRADUATE COURSES

ENTOMOLOGY

- 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, Mr. Flanders
 205A-205B. Research in Biological Control. (2-6; 2-6) Yr. Mr. Flanders

HORTICULTURE

- 201A-201B. Research in Subtropical Horticulture. (1-6; 1-6) Yr. ———

PLANT PATHOLOGY

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr.
 The Staff (Mr. Klotz in charge)
 230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr. Mr. Klotz

PLANT PHYSIOLOGY

- 203A-203B. Research in Plant Physiology. (1-6; 1-6) Yr. ———
 205A-205B. Seminar in Plant Physiology. (1-1) Yr.
 The Staff (———— in charge)

SOIL SCIENCE

- 202A-202B. Research in Soils (1-6; 1-6) Yr. Mr. Chapman
 237A-237B. Seminar in Soils. (1-1) Yr.
 The Staff (Mr. Chapman in charge)

AIR SCIENCE AND TACTICS

George H. Steel, Colonel, U.S.A.F.; *Professor of Air Science and Tactics (Chairman of the Department)*.

Thomas Lee, Lieutenant Colonel, U.S.A.F.; *Associate Professor of Air Science and Tactics*.

Paul R. Hayes, Major, U.S.A.F.; *Associate Professor of Air Science and Tactics*.

George W. Barnes, Captain, U.S.A.F.; *Assistant Professor of Air Science and Tactics*.

Sid A. Newsom, Captain, U.S.A.F.; *Assistant Professor of Air Science and Tactics*.

Colin MacLeod, Jr., First Lieutenant, U.S.A.F.; *Assistant Professor of Air Science and Tactics*.

Letters and Science List.—Not more than 8 units of lower division courses in air science may be included in the Letters and Science List of Courses. Upper division air science courses are not included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

LOWER DIVISION COURSES

The lower division or basic courses in either military or air science are prescribed for all first-year and second-year undergraduate male students who are citizens of the United States and are physically fit for military service. Students, other than veterans, must not have reached their twenty-third birthday at the time of initial enrollment in the basic course in Air Science. A first-year or second-year student claiming exemption because of noncitizenship, physical disability, age, or prior military service will present to the Registrar a petition on the prescribed form, for such exemption. Pending action on his petition the student will enroll in the courses prescribed for his year and enter upon the work thereof. The Air Science basic course consists of three hours of formal instruction per week for two academic years. The instruction prescribed for the basic course is of a general type including in the first year drill and world political geography, and in the second year drill and elementary Air Force subjects. Uniform are provided by the Government for issue to all students of the basic course. The uniform is required to be returned in good condition on the completion of the course and students are held liable for the loss of any components thereof.

- | | |
|---|--|
| 1A. Air Science I. (2) I.
World political geography; drill, | The Staff (Mr. Newsom in charge)
and exercise of command. |
| 1B. Air Science. (2) II.
World political geography; drill, | The Staff (Mr. Newsom in charge)
and exercise of command. |
| 21A. Air Science II. (2) I.
Prerequisite: courses 1A and 1B, or their equivalent.
Maps and aerial photographs; aerial navigation; meteorology; aerodynamics and propulsion; drill, and exercise of command. | The Staff (Mr. Barnes in charge) |
| 21B. Air Science II. (2) II.
Prerequisite: course 21A or its equivalent.
Applied air power, organization for defense of the United States; personal maintenance; weapons familiarization; drill, and exercise of command. | The Staff (Mr. Barnes in charge) |

UPPER DIVISION COURSES

Options in the career fields of: 1) Administration-Logistics, 2) Comptroller-ship, and 3) Flight Operations.

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 insures their development into efficient officer material, and whose interest in becoming an Air Force officer has been clearly demonstrated.

The advanced course consists of five hours of formal instruction per week for two academic years, and specialization in one of the career fields of the Air Force. Three options are offered and may be elected by the student. The advanced course includes a summer camp of six weeks' duration held normally between the two academic years of the advanced course. The number enrolled in the advanced course may vary from year to year and is dependent upon the quota allotted annually. For admission to the upper division or advanced courses 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. This provision may not apply to veterans.
3. Be selected by the Professor of Air Science and Tactics 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.
6. Pass successfully a prescribed physical examination.

Students electing to enroll in the Flight Operations option 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 and when offered.
3. Agree to accept an in-grade appointment to an Air Force Flight Training School subsequent to graduation 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.

Within quota limitations, qualified students eligible for enrollment in the advanced course will be free to select the career option of their choice except that students in business administration will normally be assigned to the Comptrollership option unless they desire to enroll in the Flight Operations option.

An officer-type uniform is furnished each 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 Air Force (current rate—90c per day). Students attending the advanced summer camp will receive pay at the rate of \$75 per month,

transportation allowance to and from camp, quarters, clothing and uniforms, meals, and medical service while at camp. Acceptance by the student 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 ROTC course and four years of education leading to the granting of a baccalaureate degree, qualifies the student for appointment and commission by the President of the United States as a Second Lieutenant in the Air Force Reserve. Students who have been selected by the Professor of Air Science and Tactics and the President of the University for scholastic excellence, may be designated as *Distinguished Military Graduates*. Such distinguished graduates are considered for direct commission in the Regular Air Force if they are eligible for appointment under the pertinent laws.

During the academic year 1951-1952 advanced courses will be given in Air Science III and Air Science IV under the option of Administration-Logistics. The options of Flight Operations and Comptrollership will be given in Air Science III (Third Year) if a minimum of at least ten students elect to enroll in each of these options. Options of Flight-Operations and Comptrollership will not be offered in Air Science IV (Fourth Year).

For further information about the Air Force Reserve Officers' Training Corps, consult the Professor of Air Science and Tactics, 2227 Union Street, Berkeley.

131A. Administration and Logistics (Air Science III). (3) I. Mr. Hayes

Prerequisite: courses 21A and 21B or their equivalent.

Air operations; psychology of leadership; Air Force administration; Air Force transportation; voice and command; drill, and exercise of command.

131B. Administration and Logistics (Air Science III). (3) II. Mr. Hayes

Prerequisite: course 131A or its equivalent.

Air Force supply; leadership, drill, and exercise of command.

132A. Comptrollership (Air Science III). (3) I. Mr. MacLeod

Prerequisite: courses 21A and 21B or their equivalent.

Specialized training in comptrollership including statistical services and analysis and presentation; air operations; elementary Air Force supply procedure; military publications; psychology of leadership; leadership, drill, and exercise of command.

132B. Comptrollership (Air Science III). (3) II. Mr. MacLeod

Prerequisite: course 132A or its equivalent.

Program standards; cost control system; functions of the Auditor-General; Air Force budget structure, accounting system, and disbursing system; leadership, drill, and exercise of command.

133A. Flight Operations (Air Science III). (3) I. _____

Prerequisite: courses 21A and 21B or their equivalent.

Mission, organization, and operation of major commands; air operations; elementary Air Force supply procedures; military publications; psychology of leadership; leadership, drill, and exercise of command.

- 133B. Flight Operations (Air Science III). (3) II. ———
Prerequisite: course 133A or its equivalent.
Principles of flight; aircraft engineering; introduction to instruments, air navigation, meteorology, and new developments; leadership, drill, and exercise of command.
- 141A. Administration and Logistics (Air Science IV). (3) I. Mr. Lee
Prerequisite: courses 131A and 131B or their equivalent.
Air Force Inspector General, military law and boards; military management; logistics; military teaching methods; psychology of leadership; leadership, drill, and exercise of command.
- 141B. Administration and Logistics (Air Science IV). (3) II. Mr. Lee
Prerequisite: course 141A or its equivalent.
Career development; wing staff; air comptroller; food service supervision; orientation and processing; leadership, drill, and exercise of command.
- 142A. Comptrollership (Air Science IV). (3) I. Mr. MacLeod
Prerequisite: courses 132A and 132B or their equivalent.
Comptroller and management functions; management analysis; program analysis; military administration; air force inspection systems; military management; leadership, drill, and exercise of command.
- 142B. Comptrollership (Air Science IV). (3) II. Mr. MacLeod
Prerequisite: course 142A or its equivalent.
Program analysis; cost analysis; methods engineering; military teaching methods; military law and boards; career development; logistics; leadership, drill, and exercise of command.
- 143A. Flight Operations (Air Science IV). (3) I. Mr. Barnes
Prerequisite: courses 133A and 133B or their equivalent.
Military administration; Air Force inspection systems; military teaching methods; military law and boards; military management; logistics; leadership, drill, and exercise of command.
- 143B. Flight Operations (Air Science IV). (3) II. Mr. Barnes
Prerequisite: course 143A or its equivalent.
Advanced navigation and bombing including theory of radar; electronic counter measures and duties of radar observer, all weather fighter; career development; orientation and processing; leadership, drill, and exercise of command.

ANATOMY

A Division of the School of Medicine

Herbert McLean Evans, B.S., M.D., D.Med. h.c. (Freiburg i.B., Santiago), Sc.D. (San Marcos), Docteur h.c. (Paris), D.Sc. h.c. (Birmingham), *Professor of Anatomy, Morris Herzstein Professor of Biology, and Director of the Institute of Experimental Biology.*

William R. Lyons, Ph.D., M.D., *Professor of Anatomy.*

John B. de C. M. Saunders, M.B., Ch.B., F.R.C.S. (Edin.), *Professor of Anatomy and Lecturer in Medical History and Bibliography (Chairman of the Division of Anatomy).*

Miriam E. Simpson, Ph.D., M.D., Docteur h.c. (Aix-Marseille), *Professor of Anatomy.*

- 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.*
 William O. Reinhardt, A.B., M.D., *Associate Professor of Anatomy.*



- Ralph L. Hawkins, M.D., *Lecturer in Anatomy.*
 Victor M. Kostainsek, M.D., *Lecturer in Anatomy for the spring semester.*
 Harold H. Lindner, M.D., *Lecturer in Topographical 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 69.

UPPER DIVISION COURSES

101. Histology and Microscopic Organology. (6) I.
 Miss Simpson in charge, Mr. Evans, Mr. Koneff, Mr. Lyons
 Three laboratory and three lecture periods a week. Prescribed for students in the first year of the 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, Mr. Kostainsek
 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
 Lectures and laboratory. Enrollment limited to twelve students.
105. Systematic Human Anatomy. (5) I.
 Mr. Reinhardt in charge, Mr. Asling, 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. Reinhardt in charge, Mr. Asling
 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 (Mr. Evans and Mr. Saunders in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

209. Human Embryology. I and II. Mr. Evans
 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. Mr. Evans
 Two hours weekly.
 Informal conferences and demonstrations. Outside reading required.

211. Haematology. I and II. Miss Simpson
Credit to be arranged.
212. Dynamic Morphology. I and II. Mr. Saunders
Hours and credit to be arranged.
Laboratory work, special reading, and informal conferences.
213. Original Investigation. I and II.
The Staff (Mr. Evans and Mr. Saunders in charge)
Hours and credit to be arranged.
Students who are prepared to undertake research in the anatomical sciences will be 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

- ¹ Edward W. Gifford, *Professor of Anthropology and Director of the Anthropological Museum.*
- Theodore D. McCown, Ph.D., *Professor of Anthropology (Chairman of the Department) and Curator of the Anthropological Museum.*
- David G. Mandelbaum, Ph.D., *Professor of Anthropology.*
- Ronald L. Olson, Ph.D., *Professor of Anthropology.*
- A. L. Kroeber, Ph.D., Sc.D., LL.D., *Professor of Anthropology, Emeritus, and Director of the Anthropological Museum, Emeritus.*
- Robert H. Lowie, Ph.D., Sc.D., *Professor of Anthropology, Emeritus.*
- † Robert F. Heizer, Ph.D., *Associate Professor of Anthropology, Director of the California Archaeological Survey, and Associate Curator of North American Archaeology.*
- John H. Rowe, Ph.D., *Associate Professor of Anthropology and Assistant Curator of South American Archaeology.*



- Darrell A. Amyx, Ph.D., *Assistant Curator of Ancient Mediterranean Art and Assistant Professor of Art.*
- Walter B. Cline, Ph.D., *Lecturer in Anthropology.*
- Anna Hadwick Gayton (Anna Hadwick Gayton Spier), Ph.D., *Associate Professor of Decorative Art and Associate Curator of Textiles.*
- H. F. Lutz, Ph.D., D.D., *Associate Curator of Near Eastern Archaeology and Professor of Egyptology and Assyriology.*
- Clement W. Meighan, A.B., *Lecturer in 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.*
- Winfield S. Wellington, M.A., Gr.Arch., *Associate Curator of Art, Director of the Art Gallery, and Professor of Decorative Art.*

¹ In residence fall semester only, 1951-1952.

† Sabbatical leave in residence, 1951-1952.

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 69.

Departmental Major Adviser: Mr. Rowe.

Preparation for the Major.—Required: Anthropology 1, 2A–2B (10). Recommended: Geography 2, History 4A–4B, 19A–19B; Near Eastern Languages 13A–13B, 25; Oriental Languages 42; Zoölogy 10. On the basis of the student's record in the lower division, the department will decide whether he will be permitted to make anthropology his major.

The Major.—Required: Anthropology 105A or 105B; 153; 101A–101B or 6 units from the following: 115, 139, 143, 147, and other courses aggregating 12 upper division units in anthropology; with substitution permitted among these 12, on approval by the department of some definite plan, up to 6 units in allied subjects, as suggested by the following courses: Anatomy 102; Classics 193, 194, 197; Decorative Art 127, 175A, 193A; Geography 121, 122A–122B, 161; German 125; Near Eastern Languages 102A–102B; Oriental Languages 142A–142B, 167, 168, 172A–172B, 177, 197A–197B; 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. Rowe, Mr. Olson
2A. Prehistory and cultural growth. Mr. Rowe
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.

* Not to be given, 1951–1952.

- *112. Protohistoric Ethnography of Europe. (3) I. Mr. McCown
Manners and customs; social and economic organization; art and religion of the prehistoric and protohistoric peoples of Europe.
- *115. Peoples of the Philippines and Indonesia. (3) I. Mr. Gifford
Geography, races, populations, cultures, and development of the Philippines, as part of the larger Indonesian sphere of world history.
- 118A-118B. The Nature of Culture. (3-3) Yr. Mr. Mandelbaum
118A. The general structure and basic processes of cultural behavior; illustrative materials from primitive societies and modern civilizations.
118B. The dynamics of cultural life; analysis of life history materials and contemporary events.
Either half of the course may be taken independently.
120. Language and Culture. (3) I. Mr. Rowe
Language and thought; classification of languages; linguistic aspects of culture; language, nation, and state.
124. Primitive Religion. (3) I. Mr. Cline
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. Cline
Races; Egyptian, Mediterranean, and Negro cultures, past and present; native achievement; Asiatic relations and influences.
141. Mexico and Central America. (3) I. Mr. Olson
Achievements of the Aztecs, Mayas, and their predecessors.
142. Peoples of the Andes. (3) II. Mr. Rowe
Culture of the Incas of Peru and of other Andean peoples.
143. Peoples of India. (3) II. Mr. Mandelbaum
A survey of the principal culture groups of India. Problems of the primitive tribes, village life, religious affiliations, caste structure, and their relation to the contemporary scene in India.
- *147. Peoples and Cultures of the Pacific Islands. (3) II. Mr. Gifford
Oceanian races and cultures; indigenous origins; Asiatic relations and influences.
- 150A-150B. Physical Anthropology. (3-3) Yr. Mr. McCown
Lecture and laboratory. Prerequisite: course 1.
Evolutionary development of man; anthropometry; analysis of data; criteria of race. Enrollment limited to twelve students; primarily for major students in anthropology and the medical sciences.

* Not to be given, 1951-1952.

- *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.
170. Primitive Education. (2) II. Mr. Pettitt
 Methods and problems in the transmission of culture from generation to generation.
190. Culture and Physical Environment. (3) II. Mr. Cline
 Human adaptation to distinct geographical environments; influence of environment on culture; analysis of environmentalism as an anthropographic concept.
195. Field Course in Archaeological Method. (1) II. Mr. Meighan
 Lectures, museum preparation, and week-end excavations.
 Enrollment limited to eighteen students, admitted by consent of the instructor. With the consent of the instructor, may be repeated without duplication of credit.
- *196. Archaeological Method. (2) I. Mr. Heizer
 Prerequisite: course 195 and consent of the instructor. Enrollment limited to twenty students. With the consent of the instructor, may be repeated without duplication of credit.
 Museum preparation, advanced field investigation, and guidance in preparation of museum material for publication.
198. Preceptorial and Reading Course. (3) I and II. Mr. 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).
 Religion and Mythology of Egypt, Babylonia, and Assyria (Near Eastern Languages 102A-102B).
 Civilizations of Eastern Asia (Oriental Languages 142A-142B).
 Buddhism as a Cultural Factor in the Far East (Oriental Languages 172A-172B).
 Oriental Societies (Sociology 166).
 Nomadic Societies (Sociology 167).
 Social Philosophy (Philosophy 108).
 Theories of History (Philosophy 147).

* Not to be given, 1951-1952.

- Personality in Society and Culture (Psychology 141).
 Social Psychology (Psychology 145).
 History of Western Social Organization (Sociology 141A-141B).
 Introduction to General Linguistics (Classics 193).
 Phonetics and Phonemics (Classics 194 or Oriental Languages 167).
 American Indian Languages (Oriental Languages 178).
 Types of Linguistic Structure (Oriental Languages 177).
 Linguistics Laboratory (Oriental Languages 197A-197B).
 Geography of North America (Geography 121).
 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).

PROFESSIONAL COURSES

These courses are intended as a nucleus of study relating to museums. Students wishing to prepare for general museum work should supplement these with such courses as Paleontology 125, Zoölogy 113, and Architecture 14.

- *489. Museums and Their Work. (3) I. Mr. Gifford
 Lectures and field trips.
 Types of museums, buildings, administration, publicity, exhibition, school service, adult education and organized group service, curatorial work, lectures, and demonstrations.
- *490. Museum Methods. (2) II. Mr. Gifford
 Prerequisite: course 489. Limited to five students.
 Practical exercises in classification, cataloguing, care, restoration, installation, labeling, and display of specimens; exhibition devices, models, loan collections, research collections; docentry practice.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

206. Proseminar. (2) I and II. Mr. McCown
 Introduction to research. For new graduate students in anthropology.
- 207A-207B. History and Theory of Anthropology. (2-2) Yr.
 Prerequisite: course 206. Mr. Mandelbaum, Mr. Cline
- 209A-209B. Culture Problems of Eurasia and North America. (2-2) Yr.
 Prerequisite: course 206. Mr. Olson
- *210. Cultural Relationships Between North and South America. (2) II.
 Prerequisite: course 206. Mr. Heizer
- *211. Problems in the Culture History of Europe and the Mediterranean.
 (2) II. Mr. McCown
 Prerequisite: course 206.
- *215. Ethnological Field Techniques. (2) I. Mr. Rowe
 Prerequisite: course 206 and consent of the 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.

* Not to be given, 1951-1952.

- 218D. Types of Culture. (2) I. Mr. Cline
 Prerequisite: course 206.
 Content and patterning of selected cultures, both literate and non-literate.
- 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) II. Mr. Heizer
 Prerequisite: course 206.
 Work on problems of tribal distribution and cultures.
247. Problems in Oceanian Anthropology. (2) I. Mr. Gifford
 Prerequisite: course 206.
 Survey of evidence available on various aspects of Oceanian cultures; significance of distributions; relationships with continental cultures.
- *253. Concepts and Problems in Physical Anthropology. (2) II. Mr. McCown
 Systematic treatment of concepts in historical perspective and of continuing and new problems in the field of human biology as this concerns physical anthropology.
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.
299. Directed Research. (2-6) I and II. The Staff (Mr. Mandelbaum 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

- ¹ 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.*
 Warren C. Perry, B.S., F.A.I.A., *Professor of Architecture.*
 William W. Wurster, A.B., *Professor of Architecture (Chairman of the Department).*

* Not to be given, 1951-1952.
¹ In residence fall semester only, 1951-1952.
 † Sabbatical leave in residence spring semester, 1951-1952.

William C. Hays, 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.*
 Jacques Schnier, M.A., *Associate Professor of Sculptural Design.*
 Harold A. Stump, A.B., *Associate Professor of Architecture.*
 George P. Simonds, M.A., *Assistant Professor of Architecture.*
 Henry J. Lagorio, M.A., *Instructor in Architecture.*
 Stefan A. Novak, M.A., *Instructor in Architecture.*
 Carlton A. Steiner, M.A., *Instructor in Architecture.*
 Kenneth H. Walijarvi, M.Arch., *Instructor in Architecture.*



Ernest Born, M.A., *Lecturer in Architecture.*
 George K. Brokaw, M.S., *Lecturer in Architecture Mechanics.*
 Kenneth A. Cardwell, A.B., *Lecturer in Architecture.*
 Thomas F. Chace, B.S., *Lecturer in Architecture.*
 Wilson G. Combs, M.A., *Lecturer in Architecture Mechanics.*
 Mario F. Corbett, *Lecturer in Architecture.*
 Vernon A. DeMars, A.B., *Lecturer in Architecture.*
 Jack P. Hillmer, A.B., *Lecturer in Architecture.*
 Robert S. Kitchen, B.Arch., *Lecturer in Architecture.*
 Eric Mendelsohn, M.A., *Lecturer in Architecture.*
 Richard O'Hanlon, *Lecturer in Sculptural Design.*
 George T. Rockrise, M.A., *Lecturer in Architecture.*
 Karl V. Steinbrugge, B.S., *Lecturer in Structural Design.*
 Bolton White, M.S., *Lecturer in Architecture.*

Letters and Science List.—Courses 5A, 5B, 5C, 5D, 6A, 6B, 6C, 6D, 14A, 14B, 113A, 113B, 114A, 114B, 117, 120A, 120B, 146, 148A, and 148B are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

LOWER DIVISION COURSES

The full course in History of Architecture (5A, 5B, 5C, 5D) is covered in four semesters; no part is prerequisite to another. Courses 5A, 5B, 5C, 5D are required of all students enrolled in the curriculum in architecture and must be accompanied by courses 6A, 6B, 6C, 6D; enrollment in the last-named courses is limited to students following the curriculum.

Credit in courses 12, 13, 112, 113A, 113B, 115 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.

1. Architectural Drawing. (3) I and II.

Mr. Stump (in charge), Mr. Cardwell, Mr. Lagorio
 Six hours weekly. Lecture and drafting practice.
 Study of architectural forms and composition.

2. Architectural Drawing: Descriptive Geometry. (3) I and II.

Mr. Stump (in charge), Mr. Lagorio, Mr. Cardwell
 Six hours weekly. Lecture and drafting practice.
 Prerequisite: solid geometry and course 1.

3. Architectural Drawing: Shades and Shadows; Perspective. (3) I and II.
Mr. Stump (in charge), Mr. Cardwell
Six hours weekly. Lecture and drafting practice.
Prerequisite: course 2.
4. Elementary Design and Theory. (4) I and II.
Mr. Czaja, Mr. Lagorio, Mr. WaliJarvi, Mr. Perry
Eight hours weekly.
Prerequisite: courses 1, 2, and 3.
- 5A. Architecture of Ancient and Classic Times. (2) II. Mr. Jory
5B. Architecture of the Dark Ages and the Middle Ages. (2) I. Mr. Moïse
5C. Architecture of the Renaissance. (2) I. Mr. Perry
5D. Architecture and Allied Arts of Modern Times. (2) II. Mr. Moïse
The background and development of contemporary forms of expression,
with an examination of the social, economic, technological, and artistic
influences affecting them.
- 6A. Classwork in Ancient and Classic Architecture. (1) II.
Mr. Kitchen, Mr. Lagorio, Mr. Simonds, Mr. Stump
6B. Classwork in Medieval Architecture. (1) I.
Mr. Kitchen, Mr. Lagorio, Mr. Simonds
6C. Classwork in Renaissance Architecture. (1) I.
Mr. Kitchen, Mr. Lagorio, Mr. Simonds, Mr. Stump
6D. Classwork in Modern Architecture and the Allied Arts. (1) II.
Mr. Kitchen, Mr. Lagorio, Mr. Simonds, Mr. Stump
12. Rendering in Water Color. (1) I and II.
Mr. Czaja, Mr. DeMars, Mr. Downs, Mr. Goodman,
Mr. Rockrise, Mr. WaliJarvi
Two hours weekly. Eight sections.
Prerequisite: Art 2A or equivalent.
13. Rendering in Pen and Ink. (1) I and II.
Mr. Czaja, Mr. Goodman, Mr. Steiner
Two hours weekly. Four sections.
Prerequisite: Art 2A or equivalent.
- 14A-14B. Elements of Sculpture. (2-2) Yr. Beginning each semester.
(Formerly numbered 14.) Mr. Schnier, Mr. O'Hanlon, Mr. Novak
Six hours weekly.
14A. Introduction to basic elements of volume design using non-objective
and representational subject matter in three dimensions and relief.
14B. Augments these studies with exercises featuring advanced phases
of the subject.
18. Introduction to Architecture. (1) I and II. Mr. Simonds
Lectures for beginning students in architecture.
Prerequisite: course 1 or equivalent.

UPPER DIVISION COURSES

The general prerequisite for upper division courses is junior standing.

- 101A-101B. Design and Theory: Junior Problems. (5-5) Yr. Beginning each
semester. Mr. Corbett, Mr. DeMars, Mr. Kitchen, Mr. Rockrise,
Mr. Steiner, Mr. Stump
Eight hours weekly.
Prerequisite: courses 1, 2, 3, and 4.

- 102A-102B. Design and Theory: Senior Problems. (5-5) Yr. Beginning each semester. Mr. Moise, Mr. White, Mr. Jory, Mr. Hillmer, Mr. Corbett, Mr. Born
Eight hours weekly.
Prerequisite: course 101A-101B.
- †102C-102D. Design and Theory. (5-5) Yr. Beginning each semester. Eight hours weekly. Mr. White
Prerequisite: course 102A-102B.
- 108A-108B. Architectural Mechanics. (3-3) Yr. Mr. Brokaw, Mr. Combs
Prerequisite: course 4, Physics 2A-2B.
110. The House. (1) I and II. Mr. Goodman
112. Advanced Water-Color Rendering. (1) I and II. Mr. Downs, Mr. Jory
Two hours weekly. Two sections.
Prerequisite: course 12 (1 unit with grade A or B).
- 113A-*113B. Sculptural Design. (2-2) Yr. Mr. Schnier
(Formerly numbered 113.)
Prerequisite: courses 14A-14B, or course 114A.
113A. Advanced design featuring three-dimensional compositions in relation to architecture and the allied arts.
113B. Advanced design featuring low-relief compositions in relation to architecture.
Either part of course may be taken independently.
- 114A-114B. The Human Figure in Sculpture. (2-2) Yr. Beginning each semester. Mr. Schnier, Mr. O'Hanlon
(Formerly numbered 114.)
Six hours weekly.
Prerequisite: course 14A-14B, or courses 4 and 14A.
114A. Advanced design exercises with form, line, and space in three dimensions and low-relief, featuring the human figure as subject matter.
114B. Extension of these exercises with emphasis on specialized features.
115. Rendering in Pencil. (1) I and II. Mr. DeMars, Mr. Kitchen, Mr. Rockrise, Mr. Walijarvi
Two hours weekly. Three sections.
Prerequisite: course 13 (1 unit).
117. Introduction to Housing and Planning. (3) I and II. Mr. Moise
Occasional seminars and field trips as arranged.
Prerequisite: senior standing.
146. Dynamics of Artistic Expression. (2) II. Mr. Schnier
Prerequisite: junior standing.
Study of expressionism in sculpture and the allied arts, including the nature of symbols, symbolic expression and the various factors operative in creative expression.
- 148A-148B. Sculpture Methods and Materials. (2-2) Yr. Six hours weekly. Mr. O'Hanlon, Mr. Schnier, Mr. Novak
Prerequisite: course 14A-14B or course 114A-114B.
- †199. Special Study for Advanced Undergraduates. (1-5) I and II. By arrangement only. The Staff (Mr. Wurster in charge)

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

* Not to be given, 1951-1952.

GRADUATE COURSES

(Admission of graduates for the work of the final or fifth year in the School 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 139.)

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. White, Mr. Downs

201B. Design and Theory: Graduate Problems. (7) I and II.

Mr. Mendelsohn, Mr. Downs
Prerequisite: course 101A-101B and course 102A-102B.

†202. Design and Theory: Advanced Problems and Research. (6) I and II.

Prerequisite: courses 200, 201A-201B, 207. Mr. Wurster

207. Architectural Engineering. (3) I and II. Mr. Steinbrugge, Mr. Chace

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: courses 200, 207, and graduate standing.
A course in specification writing, professional practice, and business relations for candidates for degree of Master of Arts only.

†298. Special Study for Graduate Students. (2-4) I and II.

By arrangement only. The Staff (Mr. 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

John C. Haley, *Professor of Art.*

Walter W. Horn, Ph.D., *Professor of Art.*

^a Ward Lockwood, *Professor of Art.*

Erle Loran, *Professor of Art.*

Otto J. Maenchen, Ph.D., *Professor of Art.*

Stephen C. Pepper, Ph.D., *Professor of Philosophy and Aesthetics (Chairman of the Department of Art).*

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

^a In residence spring semester only, 1951-1952.

Worth Ryder, *Professor of Art.*

Glenn Wessels, M.A., *Professor of Art.*

Eugen Neuhaus, Ph.D. (hon.c.), *Professor of Art, Emeritus.*

Oliver M. Washburn, A.B., *Professor of the History of Art, Emeritus.*

Ray S. Boynton, *Associate Professor of Art, Emeritus.*

Chiura Obata, *Associate Professor of Art.*

Darrell A. Amyx, Ph.D., *Assistant Professor of Art.*

Karl Kasten, M.A., *Assistant Professor of Art.*

James McCray, M.A., *Assistant Professor of Art.*

Felix Ruvolo, *Assistant Professor of Art.*



Jack A. Garbutt, M.A., *Lecturer in Art for the fall semester.*

Miné Okubo, M.A., *Lecturer in Art.*

Richard L. Sears, M.A., *Lecturer in Art for the fall semester.*

Letters and Science List.—All undergraduate courses in art are included in the Letters and Science List of Courses. For further information concerning this list, see page 69.

Departmental Major Advisers: Appreciation and Practice of Art: Mr. Wessels, Mr. Kasten; History of Art: Mr. Amyx.

Preparation for the Major.—Six units chosen from courses 1A, 1B, 1C, and 1D; and courses 2A–2B, 3A–3B. These requirements apply both to majors in Appreciation and Practice of Art and to majors in History of Art. Recommended for prospective majors in History of Art: History 4A–4B; Near Eastern Languages 13A–13B.

The Major.—A student may elect a major in Appreciation and Practice of Art or History of Art. Major students are required to consult with their major advisers regarding their programs before registering.

The department will recommend for graduation only students with at least a C average. Students who fail to maintain at least a C average may be asked to drop the major at any time.

I. Appreciation and Practice of Art. Required: 12 units of Group A courses under three different artists (2 units of Architecture 114A–114B, or 115 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 of certain courses offered in other departments. Students planning to do advanced work in History of Art are urged to develop their knowledge of foreign languages (especially French and German) as early as possible.

Assignment to Sections.—Inasmuch as space and facilities for technical courses are limited, students are advised to enroll in all Group A courses during the days of registration to be announced on placards on bulletin boards. Preference is given to first applicants.

Transfer Students.—Transfer students who have fulfilled unit requirements elsewhere are: (a) required to take an examination in order to qualify for Group A courses, and (b) are requested to present examples of their work done in other institutions before being admitted to classes and before credit can be given toward the major for work done elsewhere.

Students who qualify will be advised to take course 195 in order to acquaint themselves with the methods expected for this department's advanced courses.

LOWER DIVISION COURSES

- 1A. History of Ancient Mediterranean Art. (3) II. Mr. Amyx
Lectures and weekly section meetings to be arranged.
From the Stone Age to the end of the Roman Empire.
Prerequisite for all upper division courses in ancient art.
- 1B. History of Medieval, Renaissance, and Modern Art—Emphasis on Painting. (3) II. Mr. Ryder
Lectures and 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) I. 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. Garbutt, Mr. Haley, Mr. Kasten, Mr. Lockwood, Mr. Loran,
Mr. McCray, Miss Okubo, Mr. Ruvolo, Mr. Ryder, Mr. Sears,
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. Kasten, Miss Okubo, Mr. Ruvolo
Prerequisite: course 2A–2B.
3A: Color and form in composition.
3B: Form in composition using the human figure as subject.
12. Freehand Basic Brushwork in "Sumi" Painting. (2) I and II. Mr. Obata
10. An Introduction to Art. (2) I. Mr. McCray
(Formerly numbered 24.)
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
103A: II; 103B: II.
Course 103A is not prerequisite to 103B.
- 104A-104B. Advanced Drawing and Painting. (2-2) Yr. Mr. Haley
104A: I; 104B: II.
Course 104A is not prerequisite to 104B.
- 105A-105B. Advanced Drawing and Painting. (2-2) Yr. Mr. Loran
105A: I; 105B: II.
Course 105A is not prerequisite to 105B.
- 106A-*106B. Advanced Drawing and Painting. (2-2) Yr. Mr. McCray
106A: II.
Course 106A is not prerequisite to 106B.
- 108A-*108B. Advanced Drawing and Painting. (2-2) Yr. Mr. Kasten
108A: I.
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. Miss Okubo
110A: I, II; 110B: I.
Course 110A is not prerequisite to 110B.
- 112A-112B. Advanced Drawing and Painting. (2-2) Yr. Mr. Obata
112A: I, II; 112B: I, II.
Course 112A is not prerequisite to 112B.
- 113A-113B. Advanced Drawing and Painting. (2-2) Yr. Mr. Wessels
113A: I; 113B: II.
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) II. Mr. Ryder
Prerequisite: course 3A-3B.
The use of the human figure in art, past and present. Problems of light, color, and space involving the figure and its environment.
132. History and Theory of Art Criticism. (2) 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.

- Aesthetics. (Philosophy 136A-136B.) (3-3) Yr. Mr. Pepper
Prerequisite: 6 units of philosophy (at the discretion of the instructor these may be waived for students majoring in literature and the fine arts).

Group C: History of Art and Archaeology

153. Aegean Art. (2) I. Mr. Amyx
The art of Crete and Greece in the Bronze Age, with attention to connections with neighboring cultures.
- 154A-154B. Greek Art. (3-3) Yr. Mr. Amyx
From the Geometric Period to the beginning of the Roman Empire.
154A. From 1100 to 450 B.C.
154B. From 450 to 30 B.C.
Either half of the course may be taken separately.
- *159. Roman Art. (3) I. Mr. Amyx
The art of Italy and the Roman Empire from the Early Iron Age to the period of Constantine.
- 160A-160B. History of Early Chinese Art. (2-2) Yr. Mr. Maenchen
Prerequisite: upper division standing and course 1D or consent of the instructor.
From Shang to T'ang.
- *161A-161B. History of Later Chinese Art. (2-2) Yr. Mr. Maenchen
Prerequisite: upper division standing and course 1D or consent of the 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 the instructor.
From prehistoric times to Hokusai.
163. The Art of India. (3) II. Mr. Maenchen
(Formerly numbered 161.)
Prerequisite: upper division standing.
169. History of American Art. (3) II. _____
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. I.
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.
- *176. Renaissance Art. (3) II. Mr. Horn
- *179. Proseminar in Medieval Art. (2) II. Mr. Horn
- *183. European Painting in the Nineteenth Century. (2) I. _____

* Not to be given, 1951-1952.

SPECIAL STUDY COURSES

195. Special Study in Practice of Art. (2) I and II.

Mr. Loran, Mr. McCray
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. Wessels in charge)
Prerequisite: senior standing in art, with at least a B average in the major, and approval of the department. Credit gained in course 199 will be accepted in fulfillment of requirements in Groups A, B, or C.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

201. Advanced Study and Practice in a Selected Technique. (4) I and II.

Mr. McCray, Mr. Ruvolo, Mr. Haley, Mr. Kasten
I: Mr. McCray, Mr. Ruvolo; II: Mr. Haley, Mr. Kasten.

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. Ryder, Mr. Wessels, Mr. Loran, Mr. Ruvolo

269A: Mr. Ryder, Mr. Wessels.

269B: Mr. Loran, 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.

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

This course may be repeated for credit. Mr. Horn

287. Seminar in the History of Oriental Art. (2) I and II.

Mr. Maenchen
This course may be repeated for credit.

298. Special Study for Graduate Students. (1-6) I and II.

The Staff (Mr. McCray in charge)

Prerequisite: at least a B average in the upper division and graduate courses taken in the Department of Art. A student may not register with more than two instructors in any one semester for credit.

299. Special Study for Graduate Students in the History of Art. (1-4)

I and II. The Staff (Mr. Amyx in charge)

UNIVERSITY ART GALLERY

The University Art Gallery was established in 1933 with funds contributed for the purpose by the Class of 1933, the Regents of the University, Albert M. Bender, and other generous friends and alumni of the University. Owing to limitations of space and facilities, the Gallery does not maintain a permanently installed exhibition, but presents from time to time temporarily installed exhibits covering various phases of art. The material comprising these exhibits is drawn either from University collections in storage, or borrowed from other institutions and organizations, or from private individuals. Those interested in the Gallery's activities may address the Director, Mr. Winfield S. Wellington.

ASTRONOMY

- Otto Struve, Ph.D., Sc.D., *Professor of Astronomy and Director of the Students' Observatory (Chairman of the Department)*.
- R. Tracy Crawford, Ph.D., *Professor of Astronomy, Emeritus, and Director of the Students' Observatory, Emeritus*.
- Sturla Einarsson, Ph.D., *Professor of Astronomy, Emeritus, and Director of the Students' Observatory, Emeritus*.
- Armin O. Leuschner, Ph.D., Sc.D., LL.D., *Professor of Astronomy, Emeritus, and Director of the Students' Observatory, Emeritus*.
- 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*.
- Helen Pillans, M.S., *Instructor in Astronomy*.
- Delbert H. McNamara, Ph.D., *Associate in Astronomy*.



David Layzer, Ph.D., *Lecturer in Astronomy*.

Letters and Science List.—All undergraduate courses in astronomy except courses 3, 11, and 114 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Advisers: Mr. Struve, Mr. Weaver.

Preparation for the Major.—Physics 4A-4B-4C or equivalents; Mathematics 3A-3B, 4A-4B, 12, or equivalents; Astronomy 7A-7B; and a reading knowledge of French or German.

The Major.—Required: courses 104A-104B, 117A-117B, and 12 more units from the following courses: 105A-105B, 199; Mathematics 110A-110B, 119A-119B; Physics 105A-105B, 108B, 115, 121. Students intending to take graduate work in astronomy should complete as many as possible of these courses in the upper division.

Honors in Astronomy.—Honors are recommended on the basis of excellent work in the major.

LOWER DIVISION COURSES

1. Introduction to Astronomy. (3) I and II. Mr. Struve
 (Formerly numbered 1A-1B.)
 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. Enrollment limited to one hundred and eighty-five.
2. Practice in Observing. (2) I and II. Miss Pillans
 One lecture and three observing hours to be arranged.
 Prerequisite: course 1A or 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.

* Absent on leave, 1961-1962.

- *3. Surveyor's Course in Astronomy. (1) II. _____
 Lectures and laboratory.
 Prerequisite: Engineering 1A.
 Practical astronomy as applied to observations with the surveyor's transit for determination of azimuth, latitude, and time.
- 7A-7B. General Astronomy. (3-3) Yr. Mr. Phillips, Miss Pillans
 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.
- *10. Celestial Navigation. (3) I. _____
 Prerequisite: plane trigonometry.
 Determination of the line of position; use of nautical almanac, air almanac, HO 214, and other tables; star identification.
- *11. Celestial Navigation. (2) II. _____
 Prerequisite: course 10. Enrollment limited to sixteen students.
 Sextant observation of celestial objects for determination of position; compensation of magnetic compass; elements of gyrocompass.

UPPER DIVISION COURSES

- 104A-104B. Practical Astronomy. (3-3) Yr. Mr. McNamara
 Prerequisite: Mathematics 3A-3B, Physics 4A-4B, and either course 1A-1B or 7A-7B. Course 105A-105B is recommended and may be taken concurrently.
- 105A-105B. Theory and Practice of Computing. (3-3) Yr. Mr. Cunningham
 (Formerly numbered 107 and 108.)
 Prerequisite: a working knowledge of differential and integral calculus.
 Interpolation, numerical differentiation, and integration. Solution of equations. Least squares. Astronomical problems.
114. Practical Astronomy for Engineers. (3) I. Mr. McNamara
 Precise determination of latitude, time, and longitude.
- 117A-117B. Introduction to Astrophysics. (3-3) Yr. Mr. Weaver
 A laboratory period will occasionally be substituted by appointment for one of the regular periods.
 Prerequisite: course 7A-7B or consent of the instructor.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
 The Staff (Mr. Weaver in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- *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. (3-3) Yr. Mr. Layzer
 Prerequisite: Mathematics 110A-110B, Physics 121 or equivalents.
 A discussion of the physical foundations of modern astrophysics, with emphasis on those topics bearing directly on astrophysical theories.

* Not to be given, 1951-1952.

- 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. Layzer
Prerequisite: course 117A-117B.
The physics of stellar atmospheres.
- *218A-218B. Statistical Astronomy. (3-3) Yr. Mr. Weaver
- *225A-225B. Celestial Mechanics. (3-3) Yr. Mr. Cunningham
Prerequisite: Physics 105.
- *227A-227B. Astrophysics. (3-3) Yr. Mr. Henyey
Prerequisite: course 117A-117B.
227A. The internal structure of stars.
227B. The physical properties of nebulae and interstellar matter.
- 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.
291. Proseminar. (1-3) II. Mr. Weaver
(Formerly given as 290.)
Introduction to research. For new graduate students in Astronomy.
292. Astrophysics Seminar. (1-3) I and II. Mr. Struve, Mr. Phillips
(Formerly given as 290.)
293. Seminar in Orbits. (1-3) I and II. Mr. Cunningham
(Formerly given as 290.)
294. Seminar in Statistical Astronomy. (1-3) I. Mr. Weaver
(Formerly given as 290.)
298. Advanced Study and Research at Lick Observatory. (1-3) 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. No formal courses are offered for credit. 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.

* Not to be given, 1951-1952.

BACTERIOLOGY

Albert P. Krueger, A.B., M.D., *Professor of Bacteriology (Chairman of the Department)*.

John H. Northrop, Ph.D., Sc.D., LL.D. (*Member of the Rockefeller Institute for Medical Research*), *Professor of Bacteriology*.

Michael Doudoroff, Ph.D., *Associate Professor of Bacteriology*.

Sanford S. Elberg, Ph.D., *Associate Professor of Bacteriology*.

Roger Y. Stanier, Ph.D., *Associate Professor of Bacteriology*.

Edward A. Adelberg, Ph.D., *Assistant Professor of Bacteriology*.

Jacob Fong, Ph.D., *Assistant Professor of Bacteriology*.

Phillip N. Smith, A.B., *Associate in Bacteriology*.

Charles L. Walker, M.S., *Associate in Bacteriology*.



Horace A. Barker, Ph.D., *Professor of Plant Biochemistry*.

Edward D. Garber, Ph.D., *Lecturer in Bacteriology*.

Edwin H. Lennette, M.D., Ph.D., *Lecturer in Bacteriology for the spring semester*.

Stewart H. Madin, D.V.M., *Lecturer in Bacteriology*.

Erling J. Ordal, Ph.D., *Visiting Associate Professor of Bacteriology for the fall semester*.

Letters and Science List.—All undergraduate courses in bacteriology are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

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; Chemistry 1A, 1B, 5, 8 or 12A; Zoölogy 1A; Botany 1; Physics 2A, 2B. Recommended: Physiology 1, 1L; Public Health 5A, 5B; elementary courses in French or German; Botany 14; Chemistry 9, 12B.

The Major.—All courses required for the major must be completed with at least a grade of C. Required: courses 101, and at least 3 units of other upper division courses in the department; Biochemistry 102, and either 104 or Botany 123; and at least 9 additional units chosen from the following list with the approval of the department (in special cases, substitutions may be permitted): courses 102, 103, 104, 105, 106, 109; Botany 101, 102; Food Technology 116; Chemistry 100, 102, 103, 109; Biochemistry 105, 106, 107; Zoölogy 101, 101C, 102, 102C, 107, 110, 114 (or 115), 140; 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) II. Mr. Doudoroff

Lectures and laboratory.

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.

* Absent on leave, 1951-1952.

A general introduction to microbiology required of students majoring in bacteriology and other students intending to do further work in microbiology.

2. General Bacteriology. (4) I and II. Mr. Adelberg
Lectures and laboratory.
Prerequisite: Chemistry 1A.
Designed especially for students who are not majoring in bacteriology.
Enrollment with consent of the instructor. Enrollment limited to fifty-six students in the fall semester.
7. Survey of General Bacteriology. (3) II. Mr. Adelberg
Lectures for course 2 and one three-hour demonstration period a week.
Prerequisite: Chemistry 1A.
Not acceptable as a prerequisite for upper division courses in bacteriology.

UPPER DIVISION COURSES

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

101. Advanced Bacteriology. (7) I. Mr. Krueger, Mr. Fong, Mr. Elberg
Lectures, demonstrations, and laboratory.
Prerequisite: course 1 or 2, Chemistry 8, Zoölogy 1A. All students who intend to take this course should be immunized against typhoid and paratyphoid fevers prior to advance enrollment.
Enrollment limited to fifty-six students who will be selected on the basis of scholastic standing, major field, and year of residence.
102. Immunology, the Dynamics of Infection and Resistance. (4) II. Mr. Elberg
Prerequisite: course 101, Chemistry 8. Enrollment limited to twelve students.
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
Prerequisite: course 1 or 2 and Biochemistry 102 or equivalent (Biochemistry 103, Botany 122).
104. Advanced General Microbiology. (4) I. Mr. Ordal, Mr. Doudoroff
Prerequisite: course 1 and in addition Biochemistry 103 or Botany 122 and either Biochemistry 104 or Botany 123 or Chemistry 9.
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.
- *105. Technical Microbiology. (3) I. Mr. Stanier
Prerequisite: Chemistry 1A-1B, 8; course 1 or 2.
Utilization and control of bacteria, yeasts, and molds in industrial processes such as brewing, vinegar production, and processing of antibiotics.
106. Introduction to the Animal Viruses. (2) II. Mr. Lennette, Mr. Fong
Prerequisite: course 101 with a grade of C or better.
An introduction to the animal viruses including the techniques of virology, inclusion bodies, pathogenesis, immunity and virus-host relationship.

* Not to be given, 1951-1952.

107. Microbial Genetics. (2) II. Mr. Garber
Prerequisite: consent of the instructor.
An introduction to principles and techniques concerned in the genetics of microorganisms.
- 199A-199B. Special Study for Advanced Undergraduates. (2-2) Yr.
Mr. Krueger (in charge), Mr. Adelberg, Mr. Doudoroff,
Mr. Elberg, Mr. Fong
Open to seniors with consent of the instructor.
Study of the recent literature and preparation of a term paper.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

201. Special Study and Research. I and II.
Mr. Adelberg, Mr. Barker, Mr. Doudoroff, Mr. Elberg,
Mr. Fong, Mr. Krueger, Mr. Ordal
Credit according to the work completed.
202. Seminar in Current Research. (1) I and II.
(Mr. Adelberg in charge, fall semester; Mr. Doudoroff in charge,
spring semester), Mr. Elberg, Mr. Fong, Mr. Krueger, Mr. Ordal
Prerequisite: consent of the instructor.
Presentation of current research projects.
203. Seminar on Microbiological Metabolism. (1) II.
Mr. Doudoroff, Mr. Adelberg
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

(Including Divisions of the School of Medicine and the College of Agriculture)

- Hermann O. Fischer, Ph.D., *Professor of Biochemistry.*
Choh H. Li, Ph.D., *Professor of Biochemistry.*
Wendell M. Stanley, Ph.D., Sc.D., LL.D., Docteur h.c. (Paris), *Professor of Biochemistry (Chairman of the Department) and Director of the Virus Laboratory.*
Robley C. Williams, Ph.D., *Professor of Biophysics.*
C. Arthur Knight, Ph.D., *Associate Professor of Biochemistry.*
Fred H. Carpenter, Ph.D., *Assistant Professor of Biochemistry.*
Charles A. Dekker, Ph.D., *Assistant Professor of Biochemistry.*
Arthur B. Pardee, Ph.D., *Assistant Professor of Biochemistry.*
Howard K. Schachman, Ph.D., *Assistant Professor of Biochemistry.*
Donald L. MacDonald, Ph.D., *Instructor in Biochemistry.*



- Hamilton H. Anderson, M.D., *Professor of Pharmacology.*
Dermot B. Taylor, M.B., *Associate Professor of Pharmacology.*

DIVISION OF BIOCHEMISTRY OF THE SCHOOL OF MEDICINE

David M. Greenberg, Ph.D., *Professor of Biochemistry (Chairman of the Division)*.

Paul L. Kirk, Ph.D., *Professor of Biochemistry and Criminalistics*.

Edward S. Sundstroem, M.D., *Professor of Biochemistry, Emeritus*.

Frank W. Allen, Ph.D., *Associate Professor of Biochemistry*.

Harold Tarver, Ph.D., *Associate Professor of Biochemistry*.

Edward L. Duggan, Ph.D., *Assistant Professor of Biochemistry*.

Willis H. Riesen, Ph.D., *Instructor in Biochemistry*.

DIVISION OF PLANT BIOCHEMISTRY OF THE COLLEGE OF AGRICULTURE

Horace A. Barker, Ph.D., *Professor of Plant Biochemistry (Chairman of the Division)*.

William Z. Hassid, Ph.D., *Professor of Plant Biochemistry*.

Constant C. Delwiche, Ph.D., *Assistant Professor of Plant Biochemistry*.

Paul K. Stumpf, Ph.D., *Assistant Professor of Plant Biochemistry*.

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 69.

Departmental Major Advisers.—Mr. Allen, Mr. Carpenter.

Preparation for the Major.—Required: Chemistry 1A, 1B, 5, either 8 and 9 or, preferably, 12A, either 12B or 12C, and 109 or, preferably, 110A–110B (12B or 12C and 109 or 110A may be taken concurrently with Biochemistry 100A); Physiology 1, 1L or Zoölogy 1A and one of the following: Bacteriology 1 or 2, Botany 1 or 12, Zoölogy 1B; Mathematics 3A, 3B, 4A; Physics 4A, 4B, 4C or the equivalent (under special circumstances Physics 2A–2B and 3A–3B may be accepted). Recommended: a course in statistics; a reading knowledge of German and one other foreign language. Units obtained in Chemistry courses 12B or 12C may be counted as upper division units toward the major in biochemistry.

High school students should note that the preparation for the major is simplified if their high school programs include chemistry, physics, four years of mathematics, and two years of German.

The Major.—The major consists of 24 units of upper division courses in biochemistry and allied subjects taken in accordance with a plan approved by the departmental adviser. Normally at least 18 units of the major must be in courses in biochemistry and must include courses 100A–100B or 103, 104, and 112. Bacteriology 103 will be accepted as a biochemistry course. Ordinarily a grade-point average of at least 1 per unit undertaken in courses required as preparation for the major, is required for admission to the major. The department will certify to the completion of the major program for graduation only on the basis of at least a grade-point average of 1 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. Students planning to pursue graduate study in biochemistry should maintain a grade-point average of at least 2 in biochemistry courses.

Honors in Biochemistry.—Honors are recommended for students who maintain a grade-point average of 2 or higher. 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.

UPPER DIVISION COURSES

- 100A-100B. General Biochemistry. (3-3) Yr. Mr. Carpenter, Mr. Riesen
(Formerly numbered 103.)
Prerequisite: Chemistry 8 and 9 or 12A with a grade of C or higher; Chemistry 12B or 12C, 109 or 110A, and Physiology 1, 1L or Zoölogy 1A, completed or in progress.
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.
- 101M. Medical Biochemistry. (8) II. Mr. Greenberg, Mr. Tarver, Mr. Allen
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.
Laboratory practice in biochemical procedures including urine and blood analyses.
102. A Brief Survey of the Principles of Biochemistry. (3) I and II.
Mr. Stumpf, Mr. MacDonald, Mr. Dekker
(Formerly given as Botany 122.)
Prerequisite: Chemistry 8. Recommended: 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. Designed for non-biochemistry majors.
104. Animal Biochemistry. Laboratory. (4) II. Mr. Duggan
Prerequisite: course 100A or 102, and Chemistry 5 or Home Economics 101A, with a grade of C or higher.
Laboratory practice with the more important constituents of living matter to illustrate their chemical behavior.
105. The Biochemistry of Enzyme Action and Biological Oxidation. (3) I.
Mr. Greenberg, Mr. Pardee
Prerequisite: course 103 with a grade of C or higher or consent of the instructor. Recommended: Chemistry 109 or 110A-110B.
Classification, sources, methods of purification, physicochemical properties, and mechanism of action of enzymes and their role in metabolic processes.
106. Enzyme Chemistry Laboratory. (3) I. Mr. Pardee
Prerequisite: course 105, completed or in progress, or consent of the instructor.
Experimental methods of enzyme chemistry and biological oxidations.
107. Quantitative Microchemical Analysis. (4) I. Mr. Kirk
Lecture and laboratory.
Prerequisite: Chemistry 5, 8, and 9, with a grade of C or higher and consent of the instructor. Enrollment limited to twenty-five.
Quantitative estimation of elements and compounds on a micro basis with particular reference to biological materials.
108. Fats, Phospholipids, and Related Compounds. (2) II. Mr. Fischer
Prerequisite: courses 104 and 100A-100B, completed or in progress; Chemistry 12A and 12B or 12C.
Chemical constitution, isolation, synthesis, stereochemistry, relation to carbohydrates and the general biological role of these compounds.

109. Advanced Microchemical Analysis. (2-4) I and II. Mr. Kirk
Lecture and laboratory.
Prerequisite: course 107 with grade of B or higher, or consent of the instructor.
A limited number of students may pursue advanced microchemical techniques and special problems.
110. Advanced Biochemistry. (5) I. Mr. Allen
Lecture and laboratory.
Prerequisite: courses 101M, or 103 and 104, with a grade of C or higher.
Lectures and laboratory work appertaining to blood analysis, respiratory gas analysis, and other methods that are used in biochemical laboratories and that illustrate normal and abnormal life processes.
112. Proseminar. (1) I and II. The Staff (Mr. Li in charge)
Prerequisite: courses 100A-100B or 103 and 104, with a grade of C or higher.
Biochemical literature and newer developments of the subject.
180. Research. (3-5) I and II. The Staff (Mr. Carpenter in charge)
Prerequisite: completion of the following courses in biochemistry with an average grade of B or higher: 100A-100B or 103, 104 (or 101M).
A limited number of selected students will be given topics for investigation under the direction of a member of the staff.
199. Special Study for Advanced Undergraduates. (1-2) I and II. The Staff (Mr. Carpenter 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 139)

Courses 201 to 208 represent selected topics in biochemistry. Intended to acquaint advanced students with recent advances made in the different fields of biochemistry. Open to senior students with honor standing by consent of the instructor.

201. Protein Metabolism. (2) I. Mr. Tarver
Survey of the intermediate metabolism of amino acids and proteins.
202. Carbohydrates. (2) I. Mr. Fischer
Chemistry and biochemistry of the carbohydrates.
- *203. Biochemistry of the Hormones. (2) II. Mr. Li
Survey of the biochemistry of the hormones.
204. Biochemistry of the Viruses. (2) II. Mr. Knight
Survey of the biochemistry of the viruses.
- *205. Biochemistry of Cancer. (2) I. Mr. Greenberg
Survey of the biochemistry of neoplastic growth, tumors, and the tumor-bearing host.
- 206A-206B. Physical Biochemistry. (2-2) Yr. Mr. Schachman, Mr. Williams
206A: Mr. Schachman; 206B: Mr. Williams.
Prerequisite: Chemistry 12A, 12B or 12C, 110A-110B, Physics 4A, 4B, 4C, Mathematics 4A or consent of instructor. Recommended: course 100A-100B.
Application of modern physical concepts and experimental methods to the problems of large molecules of biological interest.

* Not to be given, 1951-1952.

- *207. The Mechanism of Drug Action. (2) I. Mr. Anderson, Mr. Taylor
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, Mr. Taylor
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. (3) II. Mr. Riesen
One lecture and two three-hour laboratory periods weekly.
Prerequisite: courses 100A-100B or 103 and 104 and consent of the instructor.
Experimental techniques used in research including isolations from natural materials, chromatographic analysis and isotopic tracer methods.
212. Graduate Seminar. (1) I and II. The Staff (Mr. Stanley in charge)
Prerequisite: completion of the major in biochemistry.
280. Research in Biochemistry. (1-9) I and II. The Staff (Mr. Stanley in charge)
Not less than 4 units except by special permission of the chairman of the department.
299. Special Study for Graduate Students. (1-3) I and II. The Staff (Mr. Stanley in charge)
Reading and conference for properly qualified graduate students under the direction of a member of the staff.
- Research Conference. (No credit) I and II. The Staff (Mr. Stanley in charge)
Members of the staff and advanced graduate students meet once a week to discuss research problems.

RELATED COURSES IN OTHER DEPARTMENTS

- Anatomy 101 (6), 102 (3).
Bacteriology 101 (7), 103 (2).
Chemistry 100 (3), 101 (3), 102 (3), 103 (3), 104 (3), 109 (3), 110A-110B (6), 111 (3), 114H (3).
Home Economics 118A (4), 118B (4).
Physiology 100A-100B (6), 104 (2), 106 (2), 110A-110B (6), 112 (3).
Soil Science 114 (3).
Zoölogy 100 (4), 101 (2), 102 (2), 106 (4), 107 (2), 114 (3), 121 (2).

BOTANY

- Lee Bonar, Ph.D., *Professor of Botany and Curator of Mycological Collections (Chairman of the Department)*.
Lincoln Constance, Ph.D., *Professor of Botany and Curator of Seed Plant Collections*.

- Alva R. Davis, Ph.D., Sc.D., *Professor of Plant Physiology.*
 Adriance S. Foster, Sc.D., *Professor of Botany.*
 Thomas H. Goodspeed, Ph.D., Doctor (hon.c.), (La Plata), Sc.D., (hon.c.),
Professor of Botany and Director of the Botanical Garden.
 Herbert L. Mason, Ph.D., *Professor of Botany and Director of the Herbarium.*
 Ralph Emerson, Ph.D., *Associate Professor of Botany.*
 George F. Papenfuss, Ph.D., *Associate Professor of Botany and Curator of Algal Collections.*
 Leonard Machlis, Ph.D., *Assistant 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.*
 James P. Bennett, Ph.D., *Professor of Plant Physiology.*
 Gordon Mackinney, Ph.D., *Professor of Food Technology.*
 Emil M. Mrak, Ph.D., *Professor of Food Technology.*
 Roy Overstreet, Ph.D., *Professor of Soil Chemistry.*
 William C. Snyder, Ph.D., *Professor of Plant Pathology.*
 Perry R. Stout, Ph.D., *Professor of Plant Nutrition.*
 Louis Jacobson, Ph.D., *Assistant Professor of Plant Nutrition.*
 Edward C. Stone, Ph.D., *Assistant Professor of Forestry.*

Letters and Science List.—All undergraduate courses in botany are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

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 specialization corresponding to the elementary (course 1), intermediate (courses 14, 16, 108, 111), and the advanced stages of instruction. Requirements 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.

Lectures and laboratory.

An introduction to the fundamental principles of biology as illustrated

Mr. Papenfuss

by plants, with emphasis on the morphology, physiology, and phylogenetic relations of the major plant groups.

Designed as the basic course in botany for all students of plant or animal science. Not open to students who have completed course 12.

12. Introduction to the Structure and Function of Plants. (4) II.

Mr. Emerson

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.

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.

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 the instructor.

Comparative structure and growth of the meristems; development and structure of important cell types, tissues, and tissue systems; comparative anatomy of stem, root, and leaf. Emphasis is placed upon the anatomy of gymnosperms and angiosperms.

107. Algology. (4) II.

Mr. Papenfuss

Lectures and laboratory.

Prerequisite: course 14.

Advanced morphology and taxonomy of algae.

108. Taxonomy of Seed Plants. (4) II. Mr. Constance
 Lectures, laboratory, and field work.
 A survey of the spermatophytes, with lectures on phylogeny and classification; laboratory and field work with collection and identification practice.
- 110A. Phylogenetic Taxonomy. (3) I. Mr. Mason
 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 110A and Genetics 100.
 An introduction to population studies and experimental and other research methods applicable to taxonomy.

RELATED COURSES IN OTHER DEPARTMENTS

- Plant Diseases (Agriculture: Plant Pathology 120).
 Technique of Plant Pathology (Agriculture: Plant Pathology 121).
 Advanced Paleobotany (Paleontology 120).
 Yeasts and Related Organisms (Agriculture: Food Technology 116).
 Microbial Metabolism (Bacteriology 103).
 Soil Microbiology (Agriculture: Soil Science 111).
 Wood Technology (Forestry 114).

Plant Physiology

111. Elementary Plant Physiology. (4) II. Mr. Machlis, Mr. Torrey
 Lectures and laboratory.
 Prerequisite: Chemistry 1A and 8.
112. Laboratory in Advanced Plant Physiology. (3) I. Mr. Torrey, Mr. Machlis
 Prerequisite: Botany 111, Chemistry 109, and Biochemistry 102, or consent of the instructor.
 To be offered every other year.
 The laboratory study of certain phases of plant physiology using radioactive, spectrophotometric, chromatographic, respirometric and other types of analysis.

RELATED COURSES IN OTHER DEPARTMENTS

- General Biochemistry (Biochemistry 102).
 Physical Chemistry (Chemistry 109, 111).
 Physicochemical Biology (Zoölogy 101, 101C, 102, 102C, 121, 122).
 Soils as a Medium for Plant Growth (Agriculture: Soil Science 110, 112, 113).
 Principles of Forest Ecology (Forestry 103).
 Properties of Colloids (Agriculture: Soil Science 114).
 The Nutrition of Green Plants (Agriculture: Plant Nutrition 115, 117).
 General Ecology (Zoölogy 125).

Cytology and Genetics

130. Plant Cytology. (4) I. Mr. Goodspeed
Lectures and laboratory.
Anatomy and physiology of the cell.

RELATED COURSES IN OTHER DEPARTMENTS

- Principles of Genetics (Agriculture: Genetics 100).
Cytogenetics (Agriculture: Genetics 101, 101C).
Biometrical Genetics (Agriculture: Genetics 102).
Organic Evolution (Agriculture: Genetics 103A-103B).
Technique of Plant Pathology (Agriculture: Plant Pathology 121).
Microscopic Technique (Zoölogy 4).
Cytology (Zoölogy 107, 107C).
Physicochemical Biology (Zoölogy 101, 101C, 102, 102C, 121, 122).
Genetics (Zoölogy 114).
Methods of Biological Investigation with Optical Instruments of Precision
(Zoölogy 119A-119B).

General Courses

150. History of Botany. (3) II. Mr. Goodspeed
Lectures, discussions, and reports.
Open to students with upper division standing in botany and major
students in other biological sciences with the approval of the instructor.
151. Principles of Plant Distribution. (3) I. Mr. Mason
Open to students with upper division standing in botany and major
students in other biological sciences with consent of the instructor.
155. Botanical Microtechnique. (2) II. Mr. Proskauer
Prerequisite: courses 105 and 130, or their equivalents and consent of
the instructor.
Special techniques in the processing of plant material for histological
and cytological study.
- 199A-199B. Special Study for Advanced Undergraduates. (1-4; 1-4) Yr.
The Staff (Mr. Bonar in charge)
Open to specially qualified seniors with consent of the instructor.

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 139)
- 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, her-
barium, or botanical garden.

203. Seminar in Cryptogamic Botany. (1) I.
Mr. Emerson (in charge), Mr. Bonar, Mr. Papenfuss, Mr. Proskauer
Prerequisite: qualified graduate students.
A seminar on problems in fungi and lower green plants.
204. Seminar in Plant Cytology. (1) II. Mr. Goodspeed
205. Seminar in Morphology and Taxonomy of Vascular Plants. (1) I.
Mr. Constance, Mr. Mason, Mr. Foster
206. Seminar in Plant Physiology. (1) II.
Mr. Mackinney (in charge), Mr. Arnon, Mr. Bennett, Mr. Jacobson,
Mr. Machlis, Mr. Overstreet, Mr. Stone, 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 111, Biochemistry 102, Chemistry 111, Soil Science 110, or consent of the instructor.
Offered every other year.
Lectures and extensive reading of original literature in plant physiology.

BUSINESS ADMINISTRATION

- ² William L. Crum, M.A., Sc.D. (hon.), Ph.D., *Professor of Economics*.
Malcolm M. Davisson, J.D., Ph.D., *Professor of Economics*.
Delbert J. Duncan, Ph.D., *Professor of Marketing*.
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)*.
Howard S. Kaltenborn, Ph.D., *Professor of Business Administration*.
† Clark Kerr, Ph.D., *Professor of Industrial Relations*.
Frank L. Kidner, Ph.D., *Professor of Economics*.
Perry Mason, 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*.
Walter Galenson, Ph.D., *Associate Professor of Industrial Relations*.
Roy W. Jastram, Ph.D., *Associate Professor of Business Administration*.
Van Dusen Kennedy, Ph.D., *Associate Professor of Industrial Relations*.
Maurice Moonitz, Ph.D., C.P.A., *Associate Professor of Accounting*.
David A. Revzan, Ph.D., *Associate Professor of Business Administration*.
Royal A. Roberts, M.B.A., *Associate Professor of Business Administration*.
‡ Arthur M. Ross, Ph.D., *Associate Professor of Business Administration*.
William K. Schmelzle, M.B.A., Ph.D., *Associate Professor of Business Administration*.

* Not to be given, 1951-1952.

² In residence spring semester only, 1951-1952.

† Sabbatical leave in residence, 1951-1952.

‡ Absent on leave, 1951-1952.

- Lawrence L. Vance, Ph.D., C.P.A., *Associate Professor of Accounting.*
 Paul F. Wendt, Ph.D., *Associate Professor of Finance.*
 David A. Alhadeff, Ph.D., *Assistant Professor of Business Administration.*
 ♥ Joseph W. Garbarino, Ph.D., *Assistant Professor of Business Administration.*
 * Neil T. Houston, M.A., Ph.D., *Assistant Professor of Business Administration.*
 Sherman J. Maisel, M.P.A., Ph.D., *Assistant Professor of Business Administration.*
 F. Theodore Malm, Ph.D., *Assistant Professor of Business Administration.*
 Catharine De Motte Quire, Ph.D., *Assistant Professor of Accounting.*
 Peter O. Steiner, Ph.D., *Assistant Professor of Business Administration.*
 Dow Votaw, M.B.A., LL.B., *Assistant Professor of Business Law.*
 Louis Marengo, Ph.D., *Instructor in Business Administration.*
 Frederic P. Morrissey, Ph.D., *Instructor in Business Administration.*
 Dale L. McKeen, M.B.A., *Associate in Accounting.*
 George L. Moss, M.B.A., C.P.A., *Associate in Accounting.*
 Morton F. Moss, M.B.A., C.P.A., *Associate in Accounting.*
 Kenneth F. Sullivan, M.B.A., C.P.A., *Associate in Accounting.*



- Robert K. Arnold, M.A., *Lecturer in Business Administration.*
 Leslie E. Carbert, M.A., *Lecturer in Economics.*
 Donald A. Corbin, M.B.A., C.P.A., *Lecturer in Accounting.*
 Douglas Dowd, A.B., *Lecturer in Economics.*
 Donald A. Fergusson, M.B.A., Ph.D., *Lecturer in Finance.*
 William H. Fink, M.A., *Lecturer in Economics.*
 John B. Glassburner, B.S., *Lecturer in Economics.*
 Guy G. Gordon, M.B.A., *Lecturer in Business Administration.*
 Michael Gort, M.A., *Lecturer in Economics.*
 Sam Hepworth, M.B.A., *Lecturer in Accounting for the spring semester.*
 Alexander R. Heron, B.S., *Lecturer in Industrial Relations for spring semester.*
 Forest G. Hill, Ph.D., *Assistant Professor of Economics.*
 John P. Holland, Jr., B.S., C.P.C.U., *Lecturer in Business Administration.*
 Richard E. Jay, M.A., *Lecturer in Business Administration.*
 Charles E. Johnson, M.B.A., *Lecturer in Accounting.*
 Luigi M. Laurenti, A.B., *Lecturer in Business Administration.*
 Choh-Ming Li, Ph.D., *Lecturer in Business Administration.*
 Ralph W. Luce, M.B.A., *Lecturer in Business Administration.*
 Olof Lundberg, C.P.A., *Lecturer in Accounting.*
 Irving A. Morrissett, B.S., *Lecturer in Economics.*
 Jack Dean Rogers, M.B.A., *Lecturer in Business Administration.*
 Raymond A. Smardon, Jr., A.B., *Lecturer in Business Administration.*
 Milo W. Smith, LL.B., *Lecturer in Business Law.*
 Franklin C. Stark, J.D., *Lecturer in Commercial Law.*
 John R. Summerfield, M.B.A., *Lecturer in Business Administration.*

♥ On military leave, 1951-1952.

* In residence spring semester only, 1951-1952.

The requirements for the curriculum in the School of Business Administration are listed on page 102.

Letters and Science List.—Courses 1A, 1B, 10, 18, 100, 135, and 150 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

LOWER DIVISION COURSES

1A-1B. Principles of Accounting. (3-3) Yr. Beginning each semester.

Mr. Corbin, Mr. Hepworth, Mr. Johnson, Mr. Mason,
Mr. G. L. Moss, Mr. M. Moss

(Formerly numbered 6A-6B.)

Two lectures and one two-hour laboratory section weekly to be arranged.

Prerequisite: at least sophomore standing. 1A is a prerequisite to 1B.

It is recommended that students who plan to enter the School of Business Administration complete this course in their sophomore year.

10. General Accounting. (3) I and II.

Mrs. Quire

Open to sophomore students in all departments of the University. Students will not receive credit for this course and 1A-1B.

A survey of accounting principles and procedures, particularly as they affect the individual.

18. Business Law: Introduction. (3) I and II.

Mr. Smith, Mr. Stark, Mr. Votaw

Prerequisite: at least sophomore standing.

The nature, purpose, and sources of law and the historical development of the law and its functions with respect to social and economic relationships; courts and court procedure; constitutional 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. Alhadeff, Mr. Arnold, Mr. Carbert, Mr. Galenson, Mr.
Glassburner, Mr. Gort, Mr. Hill, Mr. Houston, Mr. Jay,
Mr. Laurenti, Mr. Luce, Mr. Maisel, Mr. Marengo, Mr.
Morrisett, Mr. Morrissey, Mr. Rogers

(Formerly numbered 107.)

Not open to students taking Economics 100A. Primarily for juniors.

101. Business Fluctuations and Forecasting. (3) I and II.

Mr. Arnold, Mr. Carter, Mr. Dowd, Mr. Fergusson, Mr. Jay, Mr.
Laurenti, Mr. Luce, Mr. Maisel, Mr. Marengo, Mr. Morrisett

(Formerly numbered 108.)

Prerequisite: course 100.

Not open to students who have taken Economics 100B.

105. Business Law: Law of Business Organization and Regulation. (3) I and II.

Mr. Votaw

Prerequisite: course 18.

Legal aspects of various types of business organization including sole proprietorships, partnerships, corporations, and others such as business trusts and joint stock companies; general survey of the law of trade regulation.

106. Real Estate Law. (3) II. Mr. Votaw
 (Formerly numbered 183.)
 Prerequisite: course 180.
 A survey of the historical development of the law of real property; types of estates in land; provisions of constitutional, statutory, and common law and equity affecting real estate, and the relationship between real estate brokers, agents, and the public.
109. Business Law: Law of Finance. (3) I and II. Mr. Smith
 Prerequisite: course 18.
 Negotiable instruments, consisting of bills, notes, and checks, 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.
Mr. Hepworth, Mr. Johnson, Mr. Moonitz
 (Formerly numbered 160A-160B.)
 A two-hour laboratory period to be arranged. Prerequisite: course 1A-1B with average grade not lower than C. Course 121A with at least a C average is prerequisite to course 121B.
122. Cost Accounting. (3) I and II. Mr. Johnson, Mr. Vance
 (Formerly numbered 161.)
 Lectures, and a two-hour laboratory period to be arranged.
 Prerequisite: course 1A-1B with an average grade not lower than C.
 Recommended: course 121A.
123. Auditing. (3) I and II. Mr. Hepworth, Mr. Vance
 (Formerly numbered 162.)
 Lectures, and a two-hour laboratory period to be arranged.
 Prerequisite: courses 1A-1B, 121A with a grade of at least C. Completion of 121B strongly recommended.
124. Budgetary Control and Accounting Systems. (3) II. Mr. Johnson
 (Formerly numbered 163.)
 Prerequisite: courses 121A-121B, 122.
125. Governmental and Institutional Accounting. (2) I and II.
 (Formerly numbered 164.) Mr. Lundberg
 Prerequisite: course 121A-121B, or consent of the instructor.
126. Analysis of Financial Statements. (3) I and II. Mr. Moonitz
 (Formerly numbered 166.)
 Lectures, and a two-hour laboratory period to be arranged.
 Prerequisite: course 121A-121B with at least a C average and consent of the instructor.
131. Corporation Finance. (3) I and II.
Mr. Crum, Mr. Fergusson, Mr. Morrissey, Mr. Wendt
 (Formerly numbered 134.)
 Prerequisite: course 1A-1B.
 The corporation as one form of business organization; financial aspects of promotion and organization, operation as a going concern, expansion and consolidation, failure and reorganization; the capital market, financial instruments and institutions; public regulation of security issues and security exchanges.
133. Investments. (3) I and II. Mr. Wendt
 Prerequisite: course 131.

135. Economics of Insurance. (3) I and II. _____
 (Formerly given as Economics 143.)
 An introduction to the underlying principles of insurance followed by a descriptive study of the practices in the more important branches of the insurance business.
136. Life Insurance. (3) I. _____
 (Formerly numbered 144.)
 Prerequisite: course 135.
 A nontechnical study of principles and practice.
137. Property Insurance. (3) I and II. Mr. Holland, _____
 (Formerly numbered 145.)
 I: Mr. Holland; II: _____.
 Prerequisite: course 135.
138. Casualty Insurance. (3) II. Mr. Holland, _____
 (Formerly numbered 146.)
 Prerequisite: course 135.
142. Production Planning and Control. (3) I and II. Mr. Summerfield
 (Formerly numbered 127.)
 Prerequisite: course 190. Recommended: course 145.
 Production planning and budgeting; development of the production control system, including product development, materials control, plant and equipment analysis, production standards and methods, personnel and supervision; control of production quantity through routing, scheduling, and dispatching; quality control—inspection and statistical quality control; measurement of production efficiency.
145. Industrial Procurement. (3) I and II. Mr. Duncan, Mr. Roberts
 (Formerly numbered 128.)
 I: Mr. Duncan; II: Mr. Roberts.
 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. Galenson, Mr. Kennedy, _____
 (Formerly numbered 151.)
 Students will not receive credit for both Economics 150 and course 150.
 Background of the problems faced by management in the field of industrial relations and labor legislation with an introduction to personnel administration.
151. Personnel Administration. (3) I and II.
 Mr. Kaltenborn, Mr. Malm, Mr. Rogers, Mr. Smardon
 (Formerly numbered 153.)
 Prerequisite: course 150 or Economics 150, or consent of the instructor.
152. Collective Bargaining Systems. (3) I and II.
 (Formerly numbered 154.) Mr. Galenson, 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
 (Formerly numbered 155.)
 Prerequisite: course 150 or Economics 150, and course 152.
 A study of federal and state laws and court decisions affecting hours, wages, strikes, boycotts, picketing, union recognition and operation, legality of collective agreements, etc. A discussion of the National Labor Relations Act, Fair Labor Standards Act, and other legislation.
160. Marketing. (3) I and II. Mr. Duncan, Mr. Gordon, Mr. Houston, Mr. Marengo,
Mr. Revzan, Mr. Roberts
 (Formerly numbered 123.)
 The evolution of markets and marketing; market structure, organization and behavior; marketing functions; pricing and price policy; marketing problems of producers of raw materials, agriculturists, manufacturers, wholesalers and retailers; marketing costs and efficiency; public and private regulations.
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. Duncan, Mr. Roberts
 (Formerly numbered 124A-124B.)
 162A. I: Mr. Roberts; II: Mr. Duncan.
 162B. II: Mr. Roberts.
 Prerequisite: course 160.
163. Advertising. (3) I and II. Mr. Duncan, Mr. Roberts
 (Formerly numbered 125.)
 I: Mr. Roberts; II: Mr. Duncan.
 Prerequisite: course 160.
 The basic concepts of advertising dealing with the preparation and execution of copy for various types of media. Study of the English used in advertising, illustration, and other elements of copy. The evaluation of principal types of media. Study of underlying psychology in copy and the psychology of the consumer as developed through product and market research.
164. Advertising Policy. (3) II. Mr. Jastram
 (Formerly numbered 129.)
 Prerequisite: courses 100, 160, 163, or consent of the instructor.
 Executive consideration of advertising in relation to price policy and the competitive problems of the firm.
165. Sales Analysis and Sales Management. (3) I and II. Mr. Duncan, Mr. Gordon, Mr. Roberts
 (Formerly numbered 126.)
 Prerequisite: course 160.
166. Wholesaling. (3) I. 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.

- 170A. Inland Transportation. (3) I. Mr. Carter
 (Formerly given as Economics 170A.)
 A general discussion of the economics of transportation including the inland waterway, the railroad, the street railway, the automobile, and the airplane.
- 170B. Ocean Transportation. (3) II. Mr. Carter
 (Formerly given as Economics 170B.)
 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. Carter
 A survey of civil aviation: physical characteristics of aircraft, airports, and airways; government aviation agencies; air-carrier operations, services, rates, costs and finances; airport management; legal problems arising from the use of the airspace; international air transport; evaluation of employment opportunities.
174. Traffic Management. (3) I and II. Mr. Carter
180. Introduction to Real Estate and Urban Land Economics. (3) I and II.
 I: Mr. Wendt; II: Mr. Maisel. 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 the 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.
185. Foreign Exchange. (3) I and II. Mr. Li
 (Formerly numbered 136.)
 Prerequisite: Economics 135.
190. Production Organization and Management. (3) I and II.
 Mr. Malm, Mr. Rogers, Mr. Schmelzle, Mr. Summerfield
 (Formerly numbered 120.)
 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.
191. Management Problems and Policies. (3) I and II.
 (Formerly numbered 121.) Mr. Kaltenborn, Mr. Schmelzle
 Prerequisite: senior standing and courses 100, 160, 190. Recommended: courses 131, 150.

- 198A-198B. Directed Group Study. (1-3; 1-3) Yr.
The Staff (Mr. Grether in charge)
- 199A-199B. Special Study for Advanced Undergraduates. (1-3; 1-3) Yr.
The Staff (Mr. Grether in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

221. Advanced Accounting Problems. (3) I and II. _____
(Formerly numbered 261A.)
Prerequisite: courses 121A-121B, 122.
222. Advanced Cost Accounting. (3) I and II. _____
(Formerly numbered 261B.)
Prerequisite: courses 121A-121B, 122.
223. Seminar in Auditing. (3) I. 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) II. Mr. Mason
(Formerly numbered 264.)
228. Income Tax Procedure. (3) I and II. Mr. Mason
(Formerly numbered 269.)
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. Mr. Mason
(Formerly numbered 260A-260B.)
Prerequisite: course 121A-121B.
- *230. Seminar in Money and Credit. (3) I and II. _____
(Formerly numbered 236.)
Prerequisite: course 185 and Economics 135.
232. Money Markets and Capital Markets. (3) II. Mr. Fergusson
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.
234. Problems of Business Finance. (3) I and II. Mr. Crum, Mr. Fergusson
I: Mr. Fergusson; II: Mr. Crum.
- *239. Seminar in Insurance. (3) I. _____
(Formerly numbered 243.)

256. Seminar in Collective Bargaining. (3) I. Mr. Kaltenborn
Prerequisite: course 152 or the equivalent. Open to a limited number of undergraduate seniors with consent of the instructor.
Studies of the bargaining process; the legal and factual basis of collective bargaining; the provisions of collective agreements; administration 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. Mr. Heron, Mr. Kaltenborn
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. Seminar in Industrial Relations. (3) II. Mr. Kerr
(Formerly numbered 251.)
260. Advanced Marketing. (3) I and II. Mr. Duncan, Mr. Revzan
(Formerly numbered 226.)
I: Mr. Duncan; 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. Mr. Revzan
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
(Formerly numbered 223A-223B.)
279. Seminar in Transportation. (2) I and II. The Staff
(Formerly numbered 270A.)
280. Real Estate and Urban Land Economics. (3) I. Mr. Wendt
Prerequisite: courses 106, 180, 181, and 182, or consent of the 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, Mr. Revzan
(Formerly numbered 242.)
298. Seminar in Business Policy. (3) I and II. Mr. Schmelzle
(Formerly numbered 221.)
299. Research in Business Problems. (1-6) I and II. The Staff (Mr. Grether in charge)
(Formerly numbered 297.)
Primarily for candidates for the degree of Master of Business Administration.

CHEMISTRY AND CHEMICAL ENGINEERING

- ² Gerald E. K. Branch, Ph.D., *Professor of Chemistry.*
 Melvin Calvin, Ph.D., *Professor of Chemistry.*
 William F. Giauque, Ph.D., *Professor of Chemistry.*
 George E. Gibson, Ph.D., *Professor of Chemistry.*
 Joel H. Hildebrand, Ph.D., Sc.D., *Professor of Chemistry.*
 Wendell M. Latimer, Ph.D., *Professor of Chemistry.*
 Axel B. Olson, Ph.D., *Professor of Chemistry.*
 Isadore Perlman, Ph.D., *Professor of Chemistry.*
 Kenneth S. Pitzer, Ph.D., *Professor of Chemistry (Chairman of the Department).*
 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.*
 Walter C. Blasdale, Ph.D., *Professor of Chemistry, Emeritus.*
 Charles W. Porter, Ph.D., *Professor of Chemistry, Emeritus.*
 Leo Brewer, Ph.D., *Associate Professor of Chemistry.*
 James Cason, Jr., Ph.D., *Associate Professor of Chemistry.*
 Robert E. Connick, Ph.D., *Associate Professor of Chemistry.*
 Burris B. Cunningham, Ph.D., *Associate Professor of Chemistry.*
 William D. Gwinn, Ph.D., *Associate Professor of Chemistry.*
 George Jura, Ph.D., *Associate Professor of Chemistry.*
 Edwin F. Orlemann, Ph.D., *Associate Professor of Chemistry.*
 Richard E. Powell, Ph.D., *Associate Professor of Chemistry.*
 * Bruno H. Zimm, Ph.D., *Associate Professor of Chemistry.*
 LeRoy A. Bromley, Ph.D., *Assistant Professor of Chemical Engineering.*
 Marshall W. Cronyn, Ph.D., *Assistant Professor of Chemistry.*
 William G. Dauben, Ph.D., *Assistant Professor of Chemistry.*
 Donald N. Hanson, Ph.D., *Assistant Professor of Chemical Engineering.*
 Donald S. McClure, 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.*
 Henry Rapoport, Ph.D., *Assistant Professor of Chemistry.*
 David H. Templeton, Ph.D., *Assistant Professor of Chemistry.*
 Charles W. Tobias, Ph.D., *Assistant Professor of Chemical Engineering.*
 Charles R. Wilke, Ph.D., *Assistant Professor of Chemical Engineering.*
 F. Campbell Williams, Ph.D., *Assistant Professor of Chemical Engineering.*
 Z. Zimmerman Hugus, Jr., Ph.D., *Instructor in Chemistry.*
 Charles W. Koch, M.S., *Associate in Chemistry and Lecturer in Micro-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 69.

² In residence spring semester only, 1951–1952.

* Absent on leave, 1951–1952.

Entrance with Advanced Standing.—All undergraduate students entering the University with advanced standing, and students returning to the University after an absence of two years or more, who desire to take courses in chemistry more advanced than course 1B, must present themselves on or before the date of their registration to Professor Rollefson, 121 Lewis Hall, who will determine from their credentials or by an informal examination which courses they may undertake.

Choice of College.—A student may pursue the study of chemistry by enrolling either in the College of Chemistry (see page 82) or in the College of Letters and Science with a major in chemistry. In order to decide between the two alternatives, the student may note that the College of Letters and Science has certain general lower division requirements (see page 51) 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. Giaucue.

Preparation for the Major in the College of Letters and Science.—The recommended preparation is as follows: course 1A-1B, and one or more of courses 5, 12A, and 12B; Physics 4A, 4B, 4C; Mathematics 3A, 3B, 4A, 4B; and a reading knowledge of German.

The above-mentioned courses, though recommended, are actually required only in so far as they constitute prerequisites for courses included in the major. Prospective major students should familiarize themselves with such prerequisites, and the possible course sequence governed by them. Thus, Mathematics 4A is prerequisite to Chemistry 110A which in turn is 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 12B 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. Hildebrand, Mr. Giaque, Mr. Gibson, Mr. Latimer, Mr. Connick,
Mr. Jura, Mr. Powell, Mr. Gwinn, Mr. Rollefson, Mr. McClure,
Mr. O'Konski, Mr. Templeton, Mr. Brewer, Mr. Hugus
I and II: Lectures (Mr. Hildebrand).

Prerequisite: high school chemistry or high grades in high school physics and mathematics. Admission will be determined by the student's high school grade and by the results of an aptitude test, to be given during the week of enrollment.

1B. General Chemistry. Qualitative Analysis. (5) II.

Mr. Gibson, Mr. Hildebrand, Mr. Giaque, Mr. Latimer, Mr. Jura, ..
Mr. Brewer, Mr. Gwinn, Mr. McClure, Mr. O'Konski, Mr. Orle-
mann, Mr. Pitzer, Mr. Powell, Mr. Templeton
Lectures (Mr. Latimer).

Prerequisite: course 1A.

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

Lecture and laboratory. Mr. Olson, Mr. Orlemann, Mr. Pimentel
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. Branch, Mr. Cason, Mr. Rapoport

Prerequisite: course 1B with a grade of C or higher. Course 8 may be taken concurrently.

12A. Organic Chemistry. (5) I and II.

Mr. Calvin, Mr. Cronyn, Mr. Dauben, Mr. Noyce

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 12A.

12B. Organic Chemistry. (5) I and II.

Mr. Calvin, Mr. Cronyn, Mr. Dauben, Mr. Noyce

Lectures and laboratory.

Prerequisite: courses 12A, or 8 and 9.

Introduction to the chemistry of aromatic and heterocyclic compounds. Simple enolate condensations.

12C. Organic Chemistry. (3) I and II.

Mr. Dauben, Mr. Calvin

Prerequisite: courses 12A or 8 and 9 with the consent of the instructor.

Equivalent to the lecture part of 12B. 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.

UPPER DIVISION COURSES

GROUP I

102. Advanced Organic Chemistry. (3) I. Mr. Stewart
Prerequisite: courses 8 and 9 or 12A; 109 or 110B; and a reading knowledge of German.
Kinetics and mechanisms of organic reactions; the determination of structure.
103. Advanced Organic Chemistry. (3) II. Mr. Branch
Prerequisite: courses 8 and 9 or 12A; 109 or 110A; and a reading knowledge of German.
Applications of electron structures and resonance to the chemical and physical properties of organic compounds.
104. Inorganic Chemistry. (3) I. Mr. Latimer
Prerequisite: course 5.
The interpretation and correlation of inorganic reactions.
105. Advanced Quantitative Analysis. (3) 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 nonchemistry majors.
- 110A–110B. Physical Chemistry. (3–3) Yr. Beginning each semester.
110A. I: Mr. Rollefson; II: Mr. Powell. Mr. Rollefson, Mr. Powell
110B. I: Mr. Powell; II: Mr. Rollefson.
Prerequisite: course 5, Mathematics 4A, and Physics 4B.
The general principles of physical chemistry and elementary thermodynamics.

GROUP II

The courses in this group are designed primarily for honor students, but, with the approval of the instructor, other students of high academic standing may be admitted to any of these courses except those marked with the letter H.

100. Organic Chemistry—Analytical Methods. (3) I and II. Mr. Cronyn, Mr. Noyce
Prerequisite: courses 5 and 12B.
101. Organic Chemistry—Synthetic Methods. (3) I and II. Mr. Dauben, Mr. Rapoport
Prerequisite: course 12B. A reading knowledge of German is recommended.
111. Physical Chemistry—Laboratory. (3) I and II. Mr. Jura, Mr. Gwinn, Mr. O'Konski
Prerequisite: course 110A and 110B (each with a grade of C or higher), or 109 with consent of the instructor; and calculus.
- 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.
115. Microchemistry. (3) I and II. Mr. Cunningham, Mr. Koch
Prerequisite: senior standing in chemistry.

Synthesis and preparation of organic and inorganic samples on the milligram and microgram scale and their analysis by gravimetric and volumetric methods.

118. Chemistry of Surfaces and Colloids. (2) I. Mr. Jura
Before enrolling, the student must satisfy the instructor that he has sufficient preparation in chemistry and physics to be able to read the literature in this field intelligently.
119. Photochemistry. (2) II. Mr. Rollefson
This course is offered in the form of independent study, with reports at regular intervals, and a final examination.
Before enrolling, the student must satisfy the instructor that he has sufficient preparation in chemistry and physics to be able to read the literature of this field intelligently.
120. Advanced Inorganic Chemistry. (3) I and II. 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) I and II. Mr. O'Konski
Prerequisite: courses 105 or 120, and 111, and consent of the instructor.
Theory and application of instrumental methods in such fields as spectroscopy, polarography, and radioactivity to chemical problems.
- 180H. Research. (2-15) I and II. The Staff (Mr. Pitzer in charge)
Prerequisite: course 110B.
Students who have completed with high credit a satisfactory number of advanced courses may prosecute original research under the direction of one of the members of the instructing staff. The consent of the instructor must be obtained.
185. Chemical Preparations. (2-5) I and II. The Staff (Mr. Pitzer in charge)
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 139)

- 207A. Organic Chemistry. (2) I. Mr. Cason
Open to properly qualified graduate students.
Advanced synthetic topics such as the applications of Grignard reaction and enolate condensations. The chemistry of polycyclic aromatic compounds.
- 207B. Organic Chemistry. (2) II. Mr. Rapoport
Open to properly qualified graduate students. 207A is prerequisite to 207B.
The chemistry of heterocyclic compounds, including the alkaloids.

***207C. Organic Chemistry. (2) I.**

Open to properly qualified graduate students. 207A is prerequisite to 207C.

The chemistry of polycyclic compounds of biological interest, with emphasis on sterols and related compounds. The chemistry of the carbohydrates.

***207D. Organic Chemistry. (2) II.**

Open to properly qualified graduate students. 207A is prerequisite to 207D.

Synthesis and structure of terpenes. Rearrangements in the terpene series, and discussion of the mechanism of rearrangements. Synthesis and structure of antibiotics and vitamins. The chemistry of related structures.

216. Physical Chemistry, Advanced. (3) II.

Mr. Giaouque

Prerequisite: courses 111 and 114H. Open to senior honor students with consent of the instructor.

Selected topics. Use of variables other than pressure, temperature, and composition. Third Law of Thermodynamics. Evaluation of thermodynamic quantities from spectroscopic and other molecular data. Interionic attraction theory of electrolytic solutions.

217. Quantum Theory. (3) II.

Mr. Pitzer

Recommended preparation: differential equations or advanced calculus, atomic physics and thermodynamics. Open to senior honor students with the consent of the instructor.

223. Advanced Nuclear Chemistry. (2) II.

Mr. Seaborg, Mr. Perlman

Prerequisite: course 123.

Certain advanced topics relating to the chemistry of the products formed in various types of nuclear disintegrations.

280. Research. (1-9) I and II.

The Staff (Mr. 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)

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: reaction kinetics and the mechanism of chemical reactions; methods of separation of organic compounds; general physical chemistry; X-ray diffraction in crystals; group theory and its applications to chemistry; nature of the chemical bond; spectroscopy; nuclear chemistry; high temperature reactions; organic synthesis; methods of separation of organic compounds.

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 problem of his own choice, through reading or nonlaboratory study, may do so

* Not to be given, 1951-1952.

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 College of Chemistry, page 83.

143. Introduction to Chemical Engineering. (3) I and II.

Mr. Bromley, Mr. Vermeulen

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. Williams

Prerequisite: course 110B or Mechanical Engineering 105B (may be taken concurrently).

Thermal and volumetric properties of liquids and gases; interrelations of thermodynamic functions; power and refrigeration cycles; solutions; critical phenomena; reaction energetics and equilibria.

145A. Unit Operations Laboratory. (3) I and II.

Mr. Bromley

Prerequisite: course 146B and Mechanical Engineering 107.

Material and energy measurements and performance analysis on separation equipment of representative industrial types.

145B. Unit Operations Laboratory. (2) I and II. Mr. Bromley, Mr. Wilke

Prerequisite: course 145A.

An elective course for second semester seniors and graduate students in chemical engineering.

146A. Chemical Engineering Unit Operations. (4) II.

Mr. Williams, Mr. Hanson, Mr. Tobias

Prerequisite: course 110B (may be taken concurrently), 143 (with a grade of C or higher), or consent of the instructor.

Thermodynamic and frictional effects for liquid and gas flow in process equipment. Heat transmission in solids and in flow systems; radiation and pyrometry; evaporation.

146B. Chemical Engineering Unit Operations. (4) I.

Mr. Williams, Mr. Tobias, Mr. Vermeulen

Prerequisite: courses 110B, 143, and 146A or equivalent.

Diffusional operations: absorption, extraction, humidification, drying. Fractional distillation. Filtration, crushing and grinding, mechanical separation.

147. Organic Chemical Unit Processes. (3) II. Mr. Stewart, Mr. Vermeulen

Prerequisite: courses 110B; 12B or 12C and 143, or consent of the instructor.

Reaction variables and kinetics, and product recovery problems in catalytic processes such as chlorination, nitration, sulfonation, fermentation, esterification, hydrolysis, alkylation, hydrogenation, cracking, and polymerization.

149. Design of Chemical Process Plants. (3) II. Mr. 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.
152. Electrochemical Engineering. (3) I. Mr. Tobias
Prerequisite: courses 146B and 104, which may be taken concurrently, or consent of the 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.

GRADUATE COURSES

Chemistry 146B or its equivalent is prerequisite to all courses in this group.

244. Distillation. (3) I. Mr. Hanson
Design calculation methods for fractionation columns in binary and multicomponent separations.
245. Diffusional Operations. (3) I. Mr. Wilke
Fundamentals of diffusion in static and flow systems. Advanced treatment of absorption, adsorption, drying and related unit operations, in relation to mass-transfer theory.
246. Phase Equilibria in Extraction Operations. (2) II. Mr. Williams
Theory of ternary liquid systems; design of liquid-liquid contact equipment; azeotropic and extractive distillation.
249. Special Study for Graduate Students in Chemical Engineering. (2-4) I and II. The Staff (Mr. Wilke in charge)
Properly qualified graduate students who wish to pursue independent study may work on the development of new calculation methods for a single unit operation or the application of existing design data to a single process.
250. Research in Chemical Engineering. (1-6) I and II. The Staff (Mr. Vermeulen in charge)
Research facilities will be provided for graduate study in the unit physical operations and the unit chemical processes.
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. The following topics will be offered during 1951-1952:
I. Technology of high temperatures (Mr. Bromley). Special separation processes including thermal diffusion, mass diffusion and barrier diffusion (Mr. Wilke).
II. Advanced unit operations (Mr. Vermeulen).

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.
- Petroleum Engineering 209A-209B. Seminar in Petroleum Processing. (2-2) or (3-3) Yr.

CHILD DEVELOPMENT

An undergraduate major in child development is offered in the Department of Home Economics and a group major in child development in the College of Letters and Science. Information concerning these majors is presented on pages 58 and 75.

Requirements for graduate work leading to the Master's and the Ph.D. degrees are stated in the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

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.

For the convenience of students interested in electing courses in child development, offerings in University Departments are listed below.

- Growth and Development of Children. (Education 111, ———)
- The Exceptional Child. (Education 116, Mr. Holmes)
- *Counseling, Child Welfare, and Parent Education. (Education 284, ———)
- Social Development of Children and Youth. (Education 285, Mr. Tyler)
- Child Psychology. (Home Economics 132, Miss Landreth)
- Laboratory in Child Development. (Home Economics 133, Miss Landreth)
- Techniques with Young Children. (Home Economics 135, Miss Landreth)
- Nursery School Administration. (Home Economics 435, Miss Landreth)
- *Seminar in Psychology of Early Childhood. (Home Economics 232, Miss Landreth)
- Principles of Pediatrics. (Nursing 444A, Mr. Silver. Given in the School of Nursing, Medical Center, San Francisco.)
- Pediatric and Communicable Disease Nursing. (Nursing 444E, Miss Smith. Given in the School of Nursing, Medical Center, San Francisco.)
- Physiology of Growth and Development in the Child. (Physiology 102, ———)
- Developmental Psychology. (Psychology 112, Mr. McKee)
- Adolescence. (Psychology 113, Mr. Jones, Mr. McKee)
- Laboratory in Adolescent Development. (Psychology 115, Mr. Jones)
- Tests and Measurements of Infants and Preschool Children. (Psychology 116, Miss Bayley)
- Laboratory Tests and Measurements of Infants and Preschool Children. (Psychology 117, Miss Bayley)
- Mental Deficiency. (Psychology 160, Miss Bridgman)
- Clinical Psychology. (Psychology 162, Mrs. Macfarlane)

* Not to be given, 1951-1952.

Clinical Methods.	(Psychology 261A-261B, Mrs. Hecht)
Child Health.	(Public Health 125, Miss Bierman)
Child Welfare.	(Social Welfare 253A-253B, Mr. Wiltse)
Emotional Development of Children.	(Social Welfare 266A-*266B, Mrs. Maenchen)

CITY AND REGIONAL PLANNING

T. J. Kent, Jr., M.C.P., *Professor of City Planning (Chairman of the Department)*.



Catherine Bauer (Catherine Bauer Wurster), A.B., *Lecturer in City Planning*.

Mellier G. Scott, Jr., *Lecturer in City Planning*.

Francis Violich, B.S., *Associate Professor of Landscape Architecture and Lecturer in City Planning*.

Sydney H. Williams, M.A., *Visiting Associate Professor of City Planning*.

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 69.

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. See departmental ANNOUNCEMENT for further information.

LOWER DIVISION COURSE

- 21A-21B. City Life and City Planning. (2-2) Yr. Mr. Scott
A general survey of the present-day city and its problems: desirable living and working conditions that may be achieved through city and regional planning; city and county planning programs in action; citizen participation in planning.

UPPER DIVISION COURSE

121. Urban Aesthetics. (2) II. Mr. Williams
Prerequisite: upper division standing.
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

201. Seminar in City Planning History and Theory. (2) I.
(Formerly numbered 201A.) Mr. Violich, Mr. Williams
Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
Historical background of the modern city planning movement, and the theory and practice of contemporary city planning.

* Not to be given, 1951-1952.

202. Seminar in City Planning Principles and Methods. (2) II. Mr. Violich
 Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
 Description and analysis of the methods and techniques used in the practice of contemporary city planning.
203. Seminar in City Planning Law and Administration. (2) I. Mr. Kent
 Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
 Survey of city planning and urban redevelopment legislation; legal basis for planning law, including review of legal aspects of administration of zoning and subdivision regulations; organizational and administrative problems of planning agencies and boards of adjustment.
204. Seminar in Advanced City Planning Theory and Comparative Programs. (2) II. Mr. Kent
 Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
 Detailed examination and analysis of outstanding contemporary city planning programs; case study of the planning organization and program for London; analysis of the status of city planning programs for the metropolitan San Francisco Bay area.
211. City Planning Problems, First Course. (4) I. Mr. Williams
 Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
 Practical application of urban planning theory to problems of towns, cities, metropolitan regions, and urban counties, including elementary problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
212. City Planning Problems, Second Course. (4) II. Mr. Williams
 Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field.
 Practical application of urban planning theory to towns, cities, metropolitan regions, and urban counties, including problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
213. City Planning Problems, Third Course. (4) I. Mr. Kent
 Prerequisite: graduate standing and a minimum of 12 units in subjects basic to the field.
 Practical application of urban planning theory to problems of towns, cities, metropolitan regions, and urban counties, including advanced problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
299. Directed Research. (2-4) I and II.
 Mr. Kent (in charge), Miss Bauer, Mr. Violich, Mr. Williams
 Prerequisite: graduate standing and a minimum of 12 units of upper division work in subjects basic to the field. A limited number of exceptional senior students may be admitted.

CLASSICS

Murray B. Emeneau, Ph.D., *Professor of Sanskrit and General Linguistics.*

Arthur E. Gordon, Ph.D., *Professor of Latin.*

Louis Alexander MacKay, M.A. (Oxon.), *Professor of Latin (Chairman of the Department).*

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

William H. Alexander, Ph.D., LL.D., F.R.S.C., *Professor of Latin, Emeritus.*

Monroe E. Deutsch, Ph.D., LL.D., *Professor of Latin, Emeritus.*

Ivan M. Linforth, Ph.D., *Professor of Greek, Emeritus.*

Leon J. Richardson, A.B., LL.D., *Professor of Latin, Emeritus.*

* Joseph Fontenrose, Ph.D., *Associate Professor of Classics.*

William M. Green, Ph.D., *Associate Professor of Latin.*

* William Kendrick Pritchett, Ph.D., *Associate Professor of Greek.*

Ben L. Charney, Ph.D., *Assistant Professor of Latin.*

William C. Helmbold, Ph.D., *Assistant Professor of Classics.*

Frederic Peachy, Ph.D., *Assistant Professor of Classics.*



William J. Bass, A.B., *Lecturer in Classics.*

C. Douglas Chrétien, Ph.D., *Associate Professor of Speech and Lecturer in Linguistics.*

Johanna Goetzl, Ph.D., *Lecturer in Classics.*

Arnold W. Gomme, 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 69.

Departmental Major Adviser: Mr. Gordon.

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

The Major in Classics.—Required: Greek 100, 101, 102, 103; Latin 105, 106, 107, 108.

GREEK

Major Adviser: Mr. Gordon.

Preparation for the Major.—Required: Greek 1 or 1A-1B. Recommended: Latin, 1, 2, 3, 4.

The Major.—The following courses must be included in the major of 24 units: (a) Greek 100, 101, 102, 103, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Greek. The remaining units of the 24 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. Gordon.

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

* Absent on leave, 1951-1952.

The Major.—The following courses must be included in the major of 24 units: (a) Latin 105, 106, 107, 108, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Latin. The remaining units of the 24 should be chosen, with the advice of the department, from the following: upper division courses in Classics, Latin, Greek, Sanskrit; Art 153 (Aegean); Art 154A–154B (Greek); Art 159 (Roman); History 111B; but the department will consider as well other courses which the student may suggest.

CLASSICS

COURSES WHICH DO NOT REQUIRE A KNOWLEDGE OF THE GREEK OR THE LATIN LANGUAGE

(Courses in this group are designated Classics 34, Classics 35, etc.)

34. Epic Poetry: Homer and Virgil. (2) II. Mr. Gordon
A study of the *Iliad*, *Odyssey*, and *Aeneid* with reference to content, structure, significance, and influence.
35. Greek Drama. (2) I. Mr. Peachy
Lectures on twelve Greek tragedies.
- 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.
- *40A–40B. The Latin and the Greek Element in English. (2–2) Yr.
40A. The Latin Element in English. Mr. Charney
40B. The Greek Element in English.
A non-technical course designed primarily for students who have not had Latin or Greek.
- *138. The Greek and Roman Historians. (2) I. 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.
- 170C. Classical Archaeology. (2) I. Mr. Smith
Vase painting in Greece and Italy from 500 B.C.
- 171A. Classical Archaeology. (2) II. Mr. Smith
Archaeological method.
- *178. Greek and Roman Mythology. (2) II. Mr. Fontenrose
Myths, legends, and folk tales of ancient Greece and Italy; their place in the literature and art of both the ancient and the modern world.
- 180A–180B. The Latin Classics in English. (2–2) Yr. Mr. MacKay
180A. The Republic.
180B. The Early Empire.
Open to lower division students by consent of the instructor.
- *182A–182B. Ancient Greek and Roman Civilization. (2–2) Yr. Mr. Gordon
182A: Greek. 182B: Roman.
Lectures on the life and character of the ancient Greeks and Romans, and their contributions to our civilization. Either semester may be taken independently.

* Not to be given, 1951–1952.

193. Introduction to General Linguistics. (3) I. Mr. Chrétien
The principles and techniques of descriptive and comparative grammar.
- *194. Phonetics and Phonemics. (2) Mr. Emeneau
195. Linguistic Analysis. (3) II. Mr. Emeneau
Prerequisite: a course in phonetics (e.g. Classics 194, Oriental Languages 167, or an equivalent course).
Lectures and practice in analysis of morphology and syntax.
196. Introduction to Indo-European Comparative Grammar. (3) I. Mr. Emeneau
Prerequisite: a fair knowledge of at least one of the older Indo-European languages (e.g. Latin) and of one of the modern Indo-European languages other than English or a Romance language.
197. India. (2) I. Mr. Emeneau
The social, economic, and political structure of modern India.

GREEK

(Courses in this group are designated Greek 1, Greek 1A, Greek 1B, etc.)

Language and Literature

LOWER DIVISION COURSES

1. Greek for Beginners. Double Course. (5) II. Mr. Helmbold
- 1A-1B. Greek for Beginners. (3-3) Yr. Mr. Bass, Mr. Helmbold
- *48A-48B. Review of Greek Grammar. (2-2) Yr. _____
Prerequisite: Greek 1, 1A-1B, or equivalent.
Intensive review course for students requiring Greek for advanced degrees; does not fulfill requirement (b) or (e) for the Associate in Arts degree in the College of Letters and Science.

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. Bass
101. Homer. (3) II. Mr. Bass
102. Plato: *Apology and Crito*. (3) I. Mr. Peachy
103. Drama. (3) II. Mr. Peachy
112. Sophocles. (3) I. Mr. Peachy
116. Thucydides. (3) II. Mr. Gomme
- 139A-139B. Comparative Grammar of Greek and Latin. (2-2) Yr. Mr. Helmbold
Prerequisite: at least Greek 101 or Latin 4, or consent of the instructor.
139A: Phonology; 139B: Morphology. Either semester may be taken separately.
150. Greek Prose Composition. (2) II. Mr. Peachy
Prerequisite: Greek 100.
199. Special Study for Advanced Undergraduates. (1-5) I and II. Mr. MacKay in charge

* Not to be given, 1951-1952.

LATIN

(Courses in this group are designated Latin 1, Latin 2, etc.)

Language and Literature

LOWER DIVISION COURSES

1. Elementary Latin. Beginners' Course. (4) I and II.
Miss Goetzl, Mr. Gordon, Mr. Green
Sections meet five hours per week.
- 1A-1B. Latin for Beginners. (3-3) Yr. Mr. Charney
2. Elementary Latin (continuation of 1). (4) I and II.
Sections meet five hours per week. Miss Goetzl, Mr. Gordon, Mr. Bass
Prerequisite: two years of high school Latin or Latin 1 or consent of the instructor.
3. Latin Prose Readings. (4) I and II. Mr. Smith, Miss Goetzl
Prerequisite: Latin 2 or equivalent.
Students who have taken Latin 4 prior to fall semester 1951, may not receive credit in this course.
4. Introduction to Virgil. (4) I and II. Mr. Smith, Miss Goetzl
Prerequisite: Latin 3 or equivalent.
Students who have taken Latin 3 prior to fall semester, 1951, may not receive credit in this course.
- 9A-9B. Latin Composition. (2-2) Yr. Mr. Charney
Prerequisite: at least completion of Latin 2.
Recommended to accompany Latin 3 and 4.
- 48A-48B. Language Review of Elementary Latin through Caesar. (3-3) Yr.
Mr. Charney
Review course for students requiring Latin for advanced degrees; open also, with the instructor's consent, to students who have had no Latin. Either semester may be taken independently.
Does not fulfill requirement (b) or (c) for the Associate in Arts degree in the College of Letters and Science.
49. Practice in Latin Reading. (No credit) I and II. Miss Goetzl
Prerequisite: Latin 1 and 2, or equivalent.
An intensive course for graduate students of other departments who are preparing to meet the requirement of a reading knowledge of Latin.

UPPER DIVISION COURSES

Prerequisite: Latin 4. Latin 105, 106, 107, 108 should be completed before the other courses (except 109A-109B) are undertaken.

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

105. Livy. (3) I. Mr. Gordon
106. Horace: *Odes and Epodes*. (3) II. Mr. Helmbold
107. Cicero: *Tusculan Disputations*. (3) II. Mr. Green
108. Roman Comedy. (3) I. Mr. Charney
- 109A-109B. Composition and Sight Reading. (2-2) Yr. Mr. Green

154. Tacitus. (3) I. Mr. Gordon
 156. Juvenal. (3) II. Mr. Charney
 166. Latin Verse Composition. (1) II. Mr. Smith
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. MacKay in charge

SANSKRIT

(Courses in this group are designated Sanskrit 190A, Sanskrit 190B, etc.)

Language and Literature

- 190A-190B. Elementary Sanskrit. (3-3) Yr. Mr. Emeneau
 199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Emeneau

CLASSICS**GRADUATE COURSES**

All graduate courses in this department are designated Classics (Classics 201, etc.).

(Concerning conditions for admission to graduate courses, see page 139)

201. Homer. (3) II. Mr. Peachy
 220A-220B. Aristotle. (3-3) Yr. Mr. MacKay
 221. Theocritus. (3) I. Mr. Helmbold
 243. Lucretius. (3) II. Mr. MacKay
 249. Latin Lyric and Elegiac. (3) I. Mr. MacKay
 260. Latin Epigraphy. (3) II. Mr. Gordon
 261. Augustine. (3) I. Mr. Green
 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., *Assistant Professor of German.*
¹ Bertrand H. Bronson, Ph.D., *Professor of English.*
 Yuen Ren Chao, Ph.D., Litt.D., *Professor of Oriental Languages and Linguistics.*
 Michele De Filippis, Ph.D., *Professor of Italian.*

¹ In residence fall semester only, 1951-1952.

Assar G. Janzén, Ph.D., *Professor of Scandinavian Languages and Literature.*

Louis Alexander MacKay, M.A. (Oxon.), *Professor of Latin.*

Oleg A. Maslenikov, Ph.D., *Associate Professor of Slavic Languages.*

David W. Reed, Ph.D., *Assistant Professor of English.*

Arnold H. Rowbotham, Ph.D., *Professor of French (Chairman of the Committee).*

Alan R. Thompson, Ph.D., *Professor of Speech and Dramatic Literature.*

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 qualified graduate students who complete the requirements. Prospective candidates for the degree should consult the chairman of the committee in charge.

Preparation for the Major.—Required: an adequate knowledge of two foreign languages; 12 upper division units in each of two literatures, read in the original, or an equivalent competence, tested by examination. Recommended: further study in courses dealing with more than one literature, such as Dramatic Art 157A–157B, Modern European Drama; Dramatic Art 160A–160B, Dramatic Theory; English 44A–44B, Masterpieces of Literature; Philosophy 136A–136B–136C, Aesthetics; Philosophy 146, Philosophy in Literature.

The Major.—Twenty units of upper division or graduate courses and a thesis, in accordance with Plan I of the requirements for the degree of Master of Arts. A subcommittee will be in charge of the candidate's program and will be responsible for approving and directing the work on the thesis.

GRADUATE COURSE

298. Special Study for Graduate Students. (1–4) I and II.

Committee in charge

CRIMINOLOGY

Douglas M. Kelley, M.D., Med. Sc.D., *Professor of Criminology.*

Paul L. Kirk, Ph.D., *Professor of Criminalistics and Professor of Biochemistry (Division of Biochemistry).*

Austin H. MacCormick, A.B., M.A., *Professor of Criminology.*

Warren Olney III, A.B., J.D., *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 Lecturer in Legal Medicine.*

John D. Holstrom, A.B., *Lecturer in Criminology.*

Theodore D. McCown, Ph.D., *Professor of Anthropology.*

The requirements for the curricula in the School of Criminology are listed on page 105.

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.

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; interrogation of victims, witnesses, and suspects; 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. 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.

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, Mr. McCown

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 and Toxicology. (3) I.

Mr. Carr

Prerequisite: Physiology 1 or equivalent.

Analysis of death, its time and cause; of wounds, fractures, body fluids and tissues, blood traces, and other evidence to establish the circumstances of injury. Survey of the different classes of poisons; their recognition, untoward physiologic effects, and criminal uses.

115A-115B. Legal Relations Involved in Criminology. (3-3) Yr.

Mr. Olney

Prerequisite: enrollment restricted to criminology majors.

Basic principles of the law of crimes and of evidence, the enforcement processes of the criminal law, the legal relation of the police function to the prosecuting and judicial functions and to the civil law.

151. Microchemical Testing of Physical Evidence. (5) II.

Mr. Kirk

Lecture and laboratory.

Prerequisite: Chemistry 5, 12A, and 12C, with a grade of C or higher and consent of the instructor. Enrollment limited to twenty-five.

Application of microchemical and microscopic methods to the examination of physical evidence.

153. Advanced Techniques in Evidence Examination. (2-4) I and II.
 Laboratory. Mr. Kirk
 Students may not receive credit for both Biochemistry 109 and Criminology 153.
 Prerequisite: course 151 with grade of B or higher, or consent of the instructor. Limited enrollment.
 A limited number of students may pursue advanced microchemical examination of evidence and special problems in criminalistic 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 the 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.
171. Police Planning. (2) II. Mr. Wilson
 Prerequisite: course 105B or consent of the 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.
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.

- 195A-195B. Proseminar in Criminalistics. (1-1) Yr. Mr. Kirk
199. Research and Special Study for Advanced Undergraduates. (1-4) I and II.
Mr. Carr, Mr. Holstrom, Mr. Kelley, Mr. Kirk, Mr. MacCormick,
Mr. Olney, Mr. O'Neill, Mr. Wilson

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- 291A-291B. Seminar in Police Administration. (2-2) Yr. Mr. Wilson
292. Seminar in Organized Crime. (2) II. Mr. Olney
Open to students in the School of Law.
- 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.
Mr. Carr, Mr. Holstrom, Mr. Kelley, Mr. Kirk, Mr. MacCormick,
Mr. Olney, Mr. O'Neill, Mr. Wilson

DECORATIVE ART

- ² Hope M. Gladding, *Professor of Decorative Art and Design*.
Winfield Scott Wellington, M.A., Gr.Arch., *Professor of Design (Chairman
of the Department of Decorative Art), Associate Curator of Art, Anthro-
pological Museum, and Director of the Art Gallery*.
Mary F. Patterson, *Associate Professor of Decorative Art and Design,
Emeritus*.
Anna Hadwick Gayton (Anna Hadwick Gayton Spier), Ph.D., *Associate
Professor of Decorative Art and Associate Curator of Textiles, Anthro-
pological Museum*.
Lea Van Puymbroeck Miller, M.A., *Associate Professor of Decorative Art*.
† Lucretia Nelson, M.A., *Associate Professor of Design*.
Mary A. Dumas, M.A., *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*.



- John E. French, Ph.D., *Lecturer in Decorative Art*.
Ramsey A. Wieland, M.F.A., *Lecturer in Decorative Art*.
Katharine Drew Jenkins, M.A., *Lecturer in Decorative Art*.

Letters and Science List.—All undergraduate courses in decorative art are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Advisers: Mr. Wellington, Mr. Rosenquist.

Entrance with Advanced Standing.—All undergraduate transfer students requesting advanced standing are required to present examples of their work for evaluation by the staff.

² In residence spring semester only, 1951-1952.

† Sabbatical leave in residence, 1951-1952.

Preparation for the Major.—Required: course 6A-6B (4), 7A-7B (4), and Art 2A (2). Recommended: Architecture 1 (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. All students will be held for the new lower division requirements for preparation for the major beginning in the fall semester, 1952.

In order to gain major status in the department, a student must have attained at least a 1.5 average in the lower division courses in decorative art preparatory to the major. Students who fail to maintain a satisfactory scholarship average may be dismissed from the major at any time.

The Major.—Required: 24 units of upper division work in decorative art and allied subjects, including 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 141A (3), 141B (3), 142A (3), or 142B (3).

Courses 175A-175B, 176A, 193A-193B, 195A-195B should normally be taken in the junior year. Courses 130A-130B, 196A-196B should be taken in the senior year.

Honors.—Senior students who have attained at least a B average in their major courses may enroll for course 199.

Honors at graduation are awarded to students who have completed their major work with distinction and have attained uniformly high grades in all their college work.

Exhibits.—Students' work may be retained by the department as exhibit material for a specified time.

LOWER DIVISION COURSES

6A-6B. Theory of Design and Color. (2-2) Yr. Beginning each semester.

Miss Nelson, Miss Dumas, Mr. Rosenquist, Mr. French,
Mr. Rossbach, Mr. Wieland, Mr. Jenkins

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: Second-Year Problems. (2-2) Yr.

Mrs. Miller, Mr. French

UPPER DIVISION COURSES

*127. Primitive Art. (3) I.

Miss Nelson

Investigation of the structure of prehistoric, primitive, and barbaric art.

130A-130B. Interior Design. (2-2) Yr.

Mr. Wellington

130A is prerequisite to 130B.

Lectures: the design, selection, and arrangement of furniture with special consideration for its relation to the architectural background.

160A-160B. Advanced Design. (2-2) Yr. Beginning each semester.

Miss Gladding, Miss Dumas, Mr. Rossbach

Prerequisite: courses 6A-6B, 7A-7B, and Art 2A. With consent of the

* Not to be given, 1951-1952.

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.
Enrollment limited by laboratory facilities. Mr. Rosenquist
Prerequisite: some advanced design experience and consent of the instructor.
Basic elements of three-dimensional space from low relief to full round and mobile forms. Laboratory problems executed in simple techniques.
- *167. Sources of Industrial Design. (2) II. Miss Nelson
Thought and effort important to the development of machine art from its inception during the Industrial Revolution.
- 175A-175B. Primitive and Folk Textiles. (2-2) Yr. Miss Gayton
Textile arts in their historical and cultural settings.
175A. Native America; Oceania; Indonesia.
175B. Egypt; Persia; Peasant, Medieval, and Renaissance Europe.
Either half of this course may be taken independently.
- 176A-176B. Textile Design. (2-2) Yr. Mrs. Miller, Mr. Rossbach
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.
In 1951-1952 course 176A will be given in both fall and spring semesters.
- *179. Textile Analysis. (2) II. Miss Gayton
Prerequisite: courses 175A, 176A-176B, and consent of the instructor.
Enrollment limited by laboratory facilities; preference will be given to students majoring in decorative art.
- 180A-180B. Survey of Expressions in Materials. (3-3) Yr. Mr. Wellington
A study of form as exemplified by significant objects made from metals, wood, glass, clay, etc. Either half of this course may be taken independently. 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. (3) II. Miss Gladding
Spanish, English, Dutch Colonial Periods, and the Federal Period. Lectures, with slides, from material in museum collections and private houses showing the work of the more significant artists, housewrights, and craftsmen.

* Not to be given, 1951-1952.

*196A-196B. Interior Design. (2-2) Yr. Beginning each semester.

Offered every other year.

Mr. Wellington

Prerequisite: courses 6A-6B, 130A-130B, 195A, Architecture 1. 196A is prerequisite to 196B.

130A and 130B may be taken concurrently with 196A and 196B respectively. Upper division students in architecture are not required to fulfill design course prerequisites and 195A.

Periods of individual criticism and discussion of theory involved. Drawn problems.

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

The Staff (Miss Dumas 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 139)

Seminar in Decorative Art. (2)

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) I.

Miss Nelson

Studies in form and style based upon selected material from the collections of the Museum of Anthropology.

*294F. Industrial Design. (2) II.

Miss Nelson

Analytic and critical studies of selected phases of industrial design.

299. Directed Research. (2-4) I and II.

The Staff (Mr. Wellington in charge)

DRAMATIC ART

Fred O. Harris, M.F.A., *Professor of Dramatic Art (Chairman of the Department)*.

Marquis de Bassecourt Patterson, M.F.A., *Assistant Professor of Dramatic Art*.

Mary Jane Arrabit, A.B., *Instructor in Dramatic Art*.

¹ Leslie J. Mahoney, A.B., *Instructor in Dramatic Art*.

Seth Powers Ulman, M.A., *Instructor in Dramatic Art*.

Hubert S. White, Jr., A.B., *Instructor in Dramatic Art*.



Alan R. Thompson, Ph.D., *Professor of Speech and Dramatic Literature*.

* Not to be given, 1951-1952.

¹ In residence fall semester only, 1951-1952.

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 69.

Departmental Major Adviser: Mr. Harris.

Preparation for the Major.—Required: course 10A–10B (3–3), Theory of Acting.

The Major.—Required: 24 units of upper division courses including 15 units in dramatic art, with not more than 6 units of Dramatic Art 190, 191, 192, 193, and 9 units in dramatic literature, history of drama, and history of theater. In addition, students will be required to complete 6 units of supervised laboratory work in the University Theater without credit. The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department.

(A) Dramatic Art courses: Theory. Courses 130A, 130B, 130C, 130D (3–3–3–3), not more than 6 units 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 140 (3), 157A–157B (3–3), English 114A–114B, 117A–117B (3–3–3–3), 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.

LOWER DIVISION COURSE

10A–10B. Theory of Acting. (3–3) Yr. Beginning each semester.

Miss Arrabit, Mr. Mahoney, Mr. Patterson, Mr. Ulman

UPPER DIVISION COURSES

Group A. Dramatic Art: Theory and Practice

120. Theory of Stage Design. (3) II. Mr. Harris
Prerequisite: upper division standing.

130. Advanced Theory of Acting. (3)
Miss Arrabit, Mr. Mahoney, Mr. Patterson, Mr. Ulman
Prerequisite: course 10A–10B, and consent of the instructor.

130A. Greek Drama. (3) II. Miss Arrabit

130B. Shakespearean Drama. (3) I. Mr. Ulman

130C. Seventeenth- and Eighteenth-Century Drama. (3) I.
Mr. Mahoney

130D. Modern Drama. (3) II. Mr. Patterson

135. Theory of Directing. (3) I. Mr. Harris
Prerequisite: upper division standing.
- 152A-152B. Creative Playwriting. (3-3) Yr. Beginning each semester. Mr. White
Prerequisite: upper division standing and consent of the instructor.
Basic problems of creative playwriting.
- 160A-160B. Dramatic Theory. (3-3) Yr. Mr. Thompson
Lectures and reports.
Primarily for seniors. Some acquaintance with dramatic literature, especially Greek drama, is necessary; previous work in aesthetics and literary criticism is desirable.
190. Laboratory Projects in Acting. (1-6) I and II. The Staff (Miss Arrabit in charge)
Prerequisite: courses 10A-10B, 407, and consent of the department.
191. Laboratory Projects in Directing. (1-6) I and II. The Staff (Mr. Harris in charge)
Prerequisite: courses 10A-10B, 120, 135, 407, and consent of the department.
192. Laboratory Projects in Stagecrafts. (1-6) I and II. The Staff (Mr. Harris in charge)
Prerequisite: courses 10A-10B, 120, and consent of the department.
193. Laboratory Projects in Playwriting. (1-6) I and II. The Staff (Mr. White in charge)
Prerequisite: course 152A-152B and consent of the department.
Not more than 6 units from courses 190, 191, 192, and 193 will be credited toward the major.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Harris in charge)
407. Speech for the Stage. (3) I and II. Mr. Patterson
Prerequisite: course 10A-10B, and consent of the instructor.

Group B. Dramatic Literature and History of Drama

The attention of the student is directed to the Group Major in Dramatic Literature (see page 59).

140. Theater Backgrounds. (3) I and II. Mr. Ulman
Prerequisite: upper division standing.
Philosophical, cultural, and social forces in their relation to the theater as an institution and as an art.
- 157A-157B. Modern European Drama. (3-3) Yr. Mr. Thompson
Course 157A is not prerequisite to 157B.
A survey, exclusive of England, from Goethe to the present. Half the first semester will be devoted to the study of Ibsen.

RELATED COURSES IN OTHER DEPARTMENTS

English 114A-114B. The English Drama. (3-3) Yr.

English 117A-117B. Shakespeare. (3-3) Yr.

English 117E. Shakespeare. (3) I.

* French 115A-115B. Modern French Drama. (2-2) Yr.

* Not to be given, 1951-1952.

- French 120A-120B. The Seventeenth Century. (2-2) Yr.
 Greek 103. Drama. (3) II.
 German 104. Dramas of the Nineteenth Century. (3) I and 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.
 *Scandinavian 107. The Plays of Ibsen. (3) II.
 *Slavic 135. The Russian Drama. (2) II.
 Spanish 105. Modern Peninsular Drama: From the Romantic Movement to the Present. (3) I.
 Spanish 109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries. (2-2) Yr.
 Spanish 111A-111B. Cervantes. (2-2) Yr.

ECONOMICS

- †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. Davisson, J.D., Ph.D., *Professor of Economics (Chairman of the Department)*.
 Howard S. Ellis, Ph.D., LL.D., *Flood Professor of Economics*.
 William J. Fellner, Ph.D., *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*.
 Melvin M. Knight, 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*.
 Ira B. Cross, Ph.D., LL.D., *Flood Professor of Economics, Emeritus*.
 Stuart Daggett, Ph.D., *Flood Professor of Transportation, Emeritus*.
 Lucy W. Stebbins, A.B., Litt.D., *Professor of Social Economics, Emeritus*.
 Earl R. Rolph, Ph.D., *Associate Professor of Economics*.
 George F. Break, Ph.D., *Assistant Professor of Economics*.
 Robert Dorfman, Ph.D., *Assistant Professor of Economics*.
 Forest G. Hill, Ph.D., *Assistant Professor of Economics*.

* Not to be given, 1951-1952.

† Absent on leave, 1951-1952.

‡ In residence fall semester only, 1951-1952.

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.*



David A. Alhadef, Ph.D., *Assistant Professor of Business Administration.*
 Hans Brems, Ph.D., *Lecturer in Economics.*
 Leslie E. Carbert, M.A., *Lecturer in Economics.*
 Douglas Dowd, A.B., *Lecturer in Economics.*
 Griffith C. Evans, Ph.D., *Professor of Mathematics.*
 William H. Fink, M.A., *Lecturer in Economics.*
 Walter Galenson, Ph.D., *Associate Professor of Business Administration.*
 John B. Glassburner, B.S., *Lecturer in Economics.*
 Michael Gort, M.A., *Lecturer in Economics.*
 Roy W. Jastram, Ph.D., *Associate Professor of Business Administration.*
 Choh-Ming Li, Ph.D., *Lecturer in Business Administration.*
 Irving A. Morrissett, B.S., *Lecturer in Economics.*
 †Arthur M. Ross, Ph.D., *Associate Professor of Business Administration.*
 Peter O. Steiner, Ph.D., *Assistant Professor of Business Administration.*

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 69.

Departmental Major Advisers.—Mr. Hill, Chairman; Mr. Break, Mr. Carbert, Mr. Kidner, Mr. Leibenstein, Mr. Taylor.

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 in business administration listed below in the fields of concentration will be accepted in lieu of courses in economics when necessary to complete a concentration.

Except under extraordinary circumstances, no more than 9 units of economics and business administration combined may be taken in one semester.

Junior Year: courses 100A–100B (6); 110, 112, or 113 (3); 135 (3). Course 135 should be taken prior to course 100B.

Senior Year: 9 units in one of the fields of concentration listed below. Courses required to be included in the 9 units in a concentration are indicated by an asterisk.

I. Economic Theory: courses 101A, 101B, 102, 104, 133.

II. Economic History: one course in the group of Economics 110, 112* and 113* not taken in satisfaction of the junior-year requirement listed above; courses 101A, 101B, 152.

III. Monetary and Fiscal Policy: courses 130A, 130B, 133, 137.

IV. Labor Economics: courses 150*, 152*; Business Administration 151, 152, 153.

† Absent on leave, 1951–1952.

- V. Economic Systems: courses 101B, 106A, 106B, 110.
 VI. Industrial Organization: courses 121A*, 121B*, 122, 125; Business Administration 131.
 VII. Statistics: course 142 and courses to be selected in consultation with the departmental adviser.
 VIII. International Economic Relations: courses 114, 190A*, 190B*, 197; Business Administration 185.
 IX. Social Economics: courses 150, 180*, 185, 188A, 188B.

Students majoring in economics shall consult a departmental major adviser regarding their field of concentration and choice of electives. It is recommended that students elect upper division courses in other related social sciences.

The program of each student majoring in economics must be approved by one of the departmental major advisers.

The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses taken in the department and in courses in business administration taken in satisfaction of major requirements. Students who do not maintain such an average may be required at any time to withdraw from the major in economics.

LOWER DIVISION COURSES

- 1A-1B. Elements of Economics. (3-3) Yr. Beginning each semester.

Mr. Gordon, Mr. Kidner, Mr. Dowd, Mr. Alhadef, Mr. Glassburner
 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. Steiner

Two lectures; one discussion meeting; one two-hour laboratory section per week.

An introduction to modern methods of analyzing statistical data, their gathering and classification, with emphasis on analysis and presentation. Economic material is used as the basis of illustrative problems. Open to any student with two years of high school algebra or one year of high school algebra and Mathematics D.

Credit in this course is limited to 2 units for students who have received credit for Education 114 or Psychology 5.

10. Economic History. (3) I and II.

Mr. Hill

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. Brems, Mr. Carbert, Mr. Dowd, Mr. Gort,
 Mr. Hill, Mr. Hodgman, Mr. Morrissett

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, Mr. Glassburner

101A: Mr. Brady; 101B: Mr. Glassburner.

102. Advanced Economic Theory. (3) II. Mr. Break
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. The Staff (Mr. Landauer in charge)
Open to all qualified upper division students with consent of the instructor.
Primarily for non-majors in Economics.
In 1951, attention will be directed to European economic problems with special reference to Germany.
105. Economics of Consumption. (3) I. Miss Huntington
A general survey of consumption in the United States, with an analysis of the determination of consumer demands, and of the relation of the consumer to the price system.
- 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 and II. Mr. Knight, Mr. Mosk
Prerequisite: one course in economic history and consent of the instructor.
Economic development since 1850 in the leading industrialized countries.
112. Economic History of Europe. (3) I and II. Mr. Hill, Mr. Knight
113. Economic History of the United States. (3) I and II. Mr. Mosk
114. Economic Problems of Latin America. (3) I. Mr. Mosk
115. Economic Problems of the Far East. (3) I and II. Mr. Li
118. Economic Problems of Soviet Russia. (3) I and II. Mr. Hodgman
Historical developments in Soviet Russia, 1918-1950; Soviet industry, agriculture, trade, labor, planning, and the State budget; analysis of the role of wages, prices, interest, profit, and investment in the Soviet economic system, relation between the Soviet economy and Soviet ideology.
- 121A-121B. Industrial Organization. (3-3) Yr. Mr. Brems
(Formerly numbered 116A-116B.)
The organization and structure of industries and their markets in the American economy, competitive behavior, price policy, and market performance in such industries; public policy in the regulation of industry.
- *122. Theory of Domestic Trade. (3) II. Mr. Grether
Primarily for seniors.
Prerequisite: course 100A, Business Administration 100, or their equivalents.
The theory of interregional and intraregional movements of trade; the nature of competition in the channels of distribution; an evaluation of the economic consequences of selected marketing activities; the regulation of trade.
125. The Regulation of Business Affected with a Public Interest. (3) I and II.
(Formerly numbered 175.) Mr. Gort, Mr. Morrissey
I: Mr. Gort; II: Mr. Morrissey.
The basis of control, administrative and judiciary machinery employed, problems of service, price, competition, and monopoly.

* Not to be given, 1951-1952.

- 130A-130B. Public Finance and Taxation. (3-3) Yr. Beginning each semester.
Mr. Break, Mr. Carbert
- 130A. A general survey of the growth and economic effects of public expenditure and public indebtedness, the character of taxation, and tax problems (federal, state and local) of the United States.
- 130B. Examination of tax problems with principal reference to the Federal Government.
133. Dynamic Economics and Business Fluctuations. (3) I. Mr. Kidner
(Formerly numbered 103.)
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.
Primarily for juniors. Mr. Alhadeff, Mr. Carbert, Mr. Morrissett
Monetary and banking institutions; monetary theory, international monetary relations, monetary policy.
137. Money, Banking and Monetary Policy. (3) I and II. Mr. Rolph
Prerequisite: course 135.
Analysis of the monetary system of the United States and of other countries; problems involved in monetary management, evaluation of programs for monetary and banking reform.
142. Economic Statistics. (3) II. Mr. Crum
Prerequisite: course 2 and consent of the instructor.
150. Labor Economics. (3) I and II. Mr. Fuller, Mr. Taylor
The social background of labor legislation and trade unionism.
Students will not receive credit for both course 150 and Business Administration 150.
- *152. Labor Economics. (3) II. Mr. Gulick
(Formerly numbered 150B.)
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. Mr. Leibenstein
Social and economic consequences of population change with special reference to population movements in the past century, determinants of the rate of population growth and decline, the impact of population changes on economic development.
- 190A-190B. International Economic Relations. (3-3) Yr. Beginning each semester. Mr. Condliffe
Fundamental factors in international economic relations.
197. Problems in International Economic Relations. (3) I and II.
Prerequisite: course 190A-190B. Mr. Leibenstein
Research in problems of international economic policy for advanced undergraduate students.

* Not to be given, 1951-1952.

199. Special Study for Advanced Undergraduates. (1-3) I and II.
The Staff (Mr. Landauer in charge)
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. Advanced Economic Theory. (3-3) Yr.
Mr. Brems, Mr. Buchanan, Mr. Dorfman
National income analysis, macro-economics; demand and cost theory; income distribution; theory of employment.
200A. I: Mr. Buchanan, Mr. Brems; II: Mr. Buchanan.
200B. II: Mr. Brems, Mr. Dorfman.
- 201A-201B. History of Economic Thought. (3-3) Yr.
Mr. Ellis, Mr. Fellner
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. Mr. Fellner
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. Mr. Fellner
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) I. Mr. Dorfman
The study of theoretical economics with reference to methods of mathematical formulations.
208. Mathematical Economics. (3) II. Mr. Evans
Prerequisite: Mathematics 121.
210. Seminar in Economic History. (3) I. Mr. Knight
Prerequisite: course 212A-212B.
Advanced investigation of special topics in economic history.
- 212A-212B. European Economic History. (3-3) Yr. Mr. Knight
213. American Economic History. (3) I and II. Mr. Mosk
(Formerly numbered 213A.)
- 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.

* Not to be given, 1951-1952.

- 221A-221B. Industrial Organization. (3-3) Yr. Mr. Steiner
(Formerly numbered 216A-216B.)
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
(Formerly numbered 230.)
Public finance and taxation theory; public debt and fiscal policy; public policy with respect to taxation.
231. Research in State and Local Finance. (3) II. Mr. Davisson
The financial problems of state and local governments, methods of investigation, source material and analysis.
- 233A-233B. Dynamic Economics and Business Fluctuations. (3-3) Yr.
(Formerly numbered 203A-203B.) Mr. Gordon
234. Business Conditions, Domestic and Foreign. (3) II. Mr. Kidner
Prerequisite: course 233A-233B, or consent of the 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. Mr. Ellis
Analysis of banking institutions and money, monetary theory, and monetary policy.
236. Seminar in Monetary and Fiscal Theory, and Policy. (3) II.
Mr. Rolph, Mr. Dorfman
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. Mr. Gordon
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. Dorfman, Mr. Crum
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. Galenson
(Formerly numbered 252A-252B.)
Prerequisite: two courses in labor, including some European labor history, and consent of the instructor. Course 250A is not prerequisite to 250B.
An intensive reading course covering classic and current material.
- 252A-252B. Seminar in Labor Economics. (3-3) Yr. Mr. Taylor
(Formerly numbered 250A-250B.)
Prerequisite: course 150 or Business Administration 150 and consent of the instructor.
- 290A-290B. International Economics. (3-3) Yr.
290A. I: Mr. Buchanan. Mr. Buchanan, Mr. Condliffe
290B. II: Mr. Condliffe.

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. Mr. Condliffe
Open to graduate students in any department.
Research on current problems of international economic interest.
292. International Finance. (3) I. Mr. Ellis
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 the 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.
297. Seminar in Economics. (1-4) I and II. The Staff (Mr. Rolph in charge)
Credit to be arranged with the instructor.
Discussion of topics of intellectual interest by graduate students and faculty.
298. Research. (1-6) I and II. Mr. Buchanan, Mr. Fellner
Open to candidates for the Ph.D. degree who have passed the qualifying examination and who are engaged in research for the thesis, and in special cases, with consent of the instructor in charge, to graduate students who desire to do special work in a particular field.

EDUCATION

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*.

Edgar L. Morphet, Ph.D., *Professor of Education*.

Theodore L. Reller, Ph.D., *Professor of Education*.

David H. Russell, Ph.D., *Professor of Education and Associate Director of Supervised Teaching*.

Edna W. Bailey, Ph.D., *Professor of Education and Associate Director of Supervised Teaching, Emeritus*.

Frank N. Freeman, Ph.D., D.Sc., *Professor of Educational Psychology, Emeritus*.

Frank W. Hart, Ph.D., LL.D., *Professor of Education, Emeritus*.

Merton E. Hill Ed.D., *Professor of Education, Emeritus*.

George A. Rice, Ed.D., *Professor of Education, Emeritus, 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.*
- Frederic Lilge, Ph.D., *Associate Professor of Education.*
- S. E. Torsten Lund, Ph.D., *Associate Professor of Education.*
- John U. Michaelis, Ph.D., *Associate Professor of Education and Director of Supervised Teaching.*
- J. Cecil Parker, Ed.D., *Associate Professor of Education.*
- Frederick T. Tyler, Ph.D., *Associate Professor of Education, Department Executive Officer.*
- Howard F. Bretsch, Ph.D., *Assistant Professor of Education.*
- ² Watson Dickerman, Ph.D., *Assistant Professor of Education.*
- R. Bertrand Evans, Ph.D., *Assistant Professor of English and Education.*
- Jack A. Holmes, Ph.D., *Assistant Professor of Education.*
- Walter D. Loban, Ph.D., *Assistant Professor of Education and Supervisor of the Teaching of English.*
- Richard D. Mosier, Ph.D., *Assistant Professor of Education.*
- Sidney S. Sutherland, M.S., *Assistant Professor of Education and Supervisor of Teacher-Training in Agriculture, at Davis.*



- Clinton C. Conrad, Ph.D., *Lecturer in Education and Associate Director of Supervised Teaching.*
- Enoch Dumas, Ed.D., *Lecturer in Education, Associate Director of Supervised Teaching, and Supervisor of Elementary Education.*
- Laurence F. Foster, Ph.D., *Lecturer in Education and Supervisor of Audio-Visual Education.*
- Mabel F. Gifford, *Lecturer in Education for the spring semester.*
- George H. Kyme, M.A., *Associate in Music and Supervisor of the Teaching of Music.*
- Gail E. Moore, M.Ed., *Lecturer in Education for the fall semester.*
- Ilma Badgley Oatman, M.S., *Lecturer in Education and Supervisor of the Teaching of Home Economics.*
- Blake W. Spencer, M.A., *Lecturer in Education.*
- Herman A. Spindt, Ph.D., *Lecturer in Education.*
- 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.*
- John E. French, Ph.D., *Supervisor of Art Education in the Elementary School and Lecturer in Decorative Art.*
- Tanna Goldberg, A.B., *Acting Assistant Supervisor of the Teaching of Foreign Language.*
- Robert J. Griffin, M.Ed., *Supervisor of Elementary Education.*
- Ruby L. Hill, M.A., *Principal, Washington School, Oakland.*

² In residence spring semester only, 1951-1952.

Harry H. Hindman, A.B., *Supervisor of the Teaching of Physical Education for Boys.*

M. Ray Hitch, M.A., *Supervisor of the Teaching of Business Education.*

James W. Hoge, M.A., *Supervisor of the Teaching of Mathematics.*

Katharyn Hole, *Supervisor of the Teaching of Art.*

John Horns, M.A., *Supervisor of Art in the Elementary School.*

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.*

Thomas C. Polson, Ph.D., *Supervisor of the Teaching of Science.*

George A. Rice, Jr., A.B., *Supervisor of Audio-Visual Education.*

Margaret Ryan, M.A., *Supervisor of the Teaching of English and Speech.*

Leslie Smith, M.A., *Principal, Claremont Junior High School, Oakland.*

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.*

Portia F. Wagenet, A.B., *Supervisor of the Teaching of Physical Education for Girls.*

Rosalie V. Zari, A.B., *Supervisor of Junior High School Elementary Education.*

Letters and Science List.—Courses 108, 110, and not more than 3 units from 101, 102, and 105 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: Chairman of the Department and Executive Officer.

Preparation for the Major.—Psychology 1A and Zoölogy 10, and not less than 6 units in economics (preferably 1A-1B) or political science (preferably 1, 2) or social institutions (preferably 10A-10B) or philosophy (preferably 6A-6B).

The Major.—The major here described is the 24-unit major for the A.B. degree in the College of Letters and Science. A major in education is not an acceptable major for a Certificate of Completion of the teacher-training curricula.

Required: 18 units in education including the following 11 units: Education 101, 106, 110, 119, and a sequence of courses consisting of one of the following groups with additional courses from the remaining groups sufficient to make a total of 7 units.

I. History of Education: courses 102; 105.

II. Educational Psychology: courses 111; 113 or 115 or 116 or 117 or 118.

III. Elementary Education: courses 130; 118; 134 or 138.

IV. Educational Organization and Administration: courses 141; 142; 148.

V. Vocational Education: courses 160; 161 or 162; 164.

VI. Secondary Education: courses 170; 117 or 172.

VII. Social Education: courses 111; 107.

The remaining 6 units may be chosen, with the approval of the department, from upper division courses in the Letters and Science List in the following departments: Economics, Education, History, Philosophy, Political Science, Psychology, or Zoölogy. Students who transfer from normal schools or teachers colleges will not be permitted to elect courses in education for these 6 units. It is recommended that students include Philosophy 104 in the major program. Courses numbered in the 300 series are not accepted toward the major for the A.B. degree.

The department will certify to the completion of a major for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain this average may be required at any time to withdraw from the major in education.

TEACHER-TRAINING CURRICULA

Special provision is made for the professional training of teachers of three classes:

A. Those preparing to become teachers in elementary and secondary schools or in colleges.

B. Those preparing to engage in school administration, to become principals or superintendents of public schools, or to teach in normal schools or in college departments of education.

C. Graduates of normal schools, who are making further preparation for supervisory or administrative positions in elementary schools.

For detailed requirements see ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

For courses offered at Davis see PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

UPPER DIVISION COURSES

Prerequisite: junior standing and Psychology 1A or equivalent.

101. The History of Education—General Course. (3) I and II. Mr. Mosier
The development of educational thought and practice viewed as a phase of social progress.

102. The History of American Education. (2) I. Mr. Mosier
The leading ideas and ideals of American education and the institutions in which they have been embodied.

105. Education in Foreign Countries. (2) I. Mr. Lilge
Education as an instrument of political power and propaganda; its dependence on national cultural traditions. Especially valuable to students pursuing the study of a specific region.

106. Philosophy of Education. (2) I and II. Mr. Lilge
The great educational classics and their meaning for modern man.

*107. The School in the Social Order. (2) II. Mr. Mosier
A study of the interrelations of the school and society, of the complexity of culture in which education functions, and of the political and social relations of the school in contemporary American society.

108. Universities in the Modern World. (2) II. Mr. Lilge
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. 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. Mr. Tyler
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.

* Not to be given, 1951-1952.

112. The Improvement of Reading. (2) II. Mr. Buswell
 Psychology of learning as it relates to effective reading readiness program, development of word meaning, organization and analysis, improvement of comprehension, recall, skimming and speed reading, study skills and higher mental processes, provision for individual differences in ability and interest, place of skills in modern reading program.
113. Individual Tests in Guidance. (2) I and II. Mr. Holmes
 Prerequisite: 6 units in psychology or educational psychology.
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.
118. Psychology of Elementary School Subjects. (2) I. Mr. Russell
 Prerequisite: courses 110, 130.
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.
124. Principles of Curriculum Development. (2) I. Mr. Parker
 Prerequisite: courses 130 or 170, 110, 111.
 Principles underlying the development of curricula on the elementary and secondary levels.
127. Principles of Teaching the Slow Learner. (2) II. 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.
130. Elementary Education. (3) I and II. Mr. Barnett
 Prerequisite: course 110 (completed or taken concurrently).
 Limited to candidates for the elementary teaching credential, for the general administrative credential, and for the doctor's 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.

* Not to be given, 1951-1952.

132. Art and Music in the Elementary School. (2) I and II.
 I: Mr. Michaelis; II: Mr. Dumas. Mr. Dumas, Mr. Michaelis
 Prerequisite: courses 110 and 130.
 Enrollment limited to facilities available.
 Functions, organization, instructional planning, implications of research in child development for teaching and selection of materials, and evaluation of educational outcomes in the art and music curricula in elementary schools.
134. Reading and Literature in the Elementary School. (2) I and II.
 Prerequisite: courses 110 and 130. Mr. Russell
 Objectives, standards of attainment, types of reading instruction, diagnostic and remedial techniques, reading readiness, place of reading in the activity program. Introduction to children's literature, children's interests in reading, criteria for selection of content, the place of supplementary and library reading.
138. Social Studies in the Elementary School. (2) I and II.
 Mr. Dumas, Mr. Michaelis, Mr. Russell
 I: Mr. Michaelis; II: Mr. Dumas, Mr. Russell.
 Prerequisite: courses 110 and 130.
 Aims, content, and outcomes; unified social studies versus separate courses; critical analysis of typical units and courses of study; selection, sequence, and organization of units; the place of textbooks and supplementary materials; relation to the Three R's, the arts, and elementary sciences.
140. The Teacher and Administration. (2) I and II. Mr. Bretsch
141. The Administration of City School Systems. (2) II. Mr. Bretsch
142. The Administration of State School Systems. (2) I. Mr. Morphet
148. Public Education in California. (2) II. Mr. Morphet
 Organization and administration of the California school system, as given in the school law of the State and as interpreted by the rulings of the State Superintendent of Public Instruction and the Attorney General.
149. See under *Special Education*, page 269.
151. Administration of the School Health Program. (2) I and II.
 Mr. VanderSlice
 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. _____
 Prerequisite: course 110.
 A basic course concerned with problems of childhood.
- *154. Mental Hygiene—Advanced. (2) I. _____
 Prerequisite: course 153 or its equivalent.
160. Vocational Education. (2) I. Mr. Moore
 Philosophy and organization of vocational education of less than college grade, with particular reference to principles underlying education for industry, agriculture, commerce, homemaking, and continuation education.

161. Occupational and Educational Information. (2) I. _____
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. _____
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. _____
Nature and scope of the student personnel program in schools and colleges; role of teacher, counselor, and administrator. Survey of basic tools and techniques.
165. Business Education in Secondary Schools. (3) I and II. Mr. Spencer
This course is prerequisite to 320E, Section 13.
166. Home Economics Education. (3) I and II. Mrs. Oatman
Designed for teachers, student dietitians, and nutritionists in public health.
170. Secondary Education. (2) I and II. Mr. Lund, Mr. Loban
Prerequisite: courses 110 and 111; ordinarily juniors will not be admitted. (These requirements will be administered without exception for all University of California students. Graduates from other institutions may take the prerequisites together with the course, but are advised that this will be a decided handicap.)
172. Junior High School Education. (2) II. Mr. Loban
Prerequisite: course 110 (may be taken concurrently).
181. Adult Education. (3) I and II. _____
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.
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.

200. Research Techniques. Seminar. (2) I and II. Mr. Buswell
- 201A-201B. History of Education. Seminar. (2-2) Yr. Mr. Mosier
Admission on consultation with the instructor.
203. Problems in the History of Education. (2) II. Mr. Mosier
Admission on consultation with the 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. Lilje
Admission on consultation with the instructor.
209. Philosophical Issues in Contemporary Education. (2) I. Mr. Lilje
Admission on consultation with the 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. Advanced Educational Psychology.
- 210A. Psychological Foundations of Education. (3) I. Mr. Brownell
Prerequisite: 8 units in educational psychology and/or psychology.
- 210B. Individual Differences. (2) II. Mr. Tyler
Prerequisite: courses 110 and 114.
A systematic treatment of the literature on individual differences in mental abilities and the inheritance of mental traits as they relate to education.
- 210C. Psychology of Learning. (2) I. Mr. Buswell
Prerequisite: course 110.
A survey of research and literature in the field of educational psychology.
- 210D. Psychology of Learning. (2) II. Mr. Tyler
Prerequisite: courses 110 and 114.
- 211B. Children's Thinking. (2) II. Mr. Russell
Prerequisite: consent of the 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.
- *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.
- *214A. Advanced Statistics with Application to Methods of Educational Investigation. (2) I. Mr. Carter
Prerequisite: a course in elementary statistics and consent of the instructor.
For students conducting investigations involving statistical analysis, or expecting to teach tests and measurements and statistical methods in colleges.
- 216A-216B. Educational Psychology. Seminar. (2-2) Yr.
Mr. Brownell, Mr. Buswell, Mr. Carter, Mr. Gilbert,
Mr. Holmes, Mr. Tyler
- 217A. Experimental Education. (2) I and II. Mr. Gilbert
Admission on consultation with the instructor.
Laboratory experiments, with special reference to the more elaborate techniques applied to the various school subjects. The course includes voice

* Not to be given, 1951-1952.

recording, photographing eye movements in reading and spelling, analysis of rhythm in reading, arithmetic, and writing, and studies of the motor responses accompanying appreciation. Each member of the class will participate in all experiments.

- 217B. Experimental Education. (2) I and II. Mr. Gilbert
Prerequisite: course 217A.
Students will be expected to complete an advanced laboratory project.
- 218A-218B. Investigations in Language Arts Education. (2-2) Yr. Mr. Russell
Prerequisite: consent of the instructor.
Examinations of research studies; courses of study, and major innovations; assistance to students who wish to work on individual problems.
219. Investigations in Arithmetic Education. (2) II. Mr. Brownell
Prerequisite: consent of the instructor.
Designed for experienced teachers and supervisors. A critical analysis of selected research reports relating to arithmetic teaching and learning, 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 the instructor.
226. Curriculum Construction. (2) II. Mr. Parker
227. Problems in Curriculum Development Practicum. (2) I and II. Mr. Parker
Prerequisite: two courses in elementary and/or secondary curriculum, teaching experience, graduate standing, and consent of the instructor.
Designed especially for administrators, supervisors, teachers in elementary and secondary schools, and county officers who have problems in curriculum development.
- 230A-230B. Elementary Education Seminar. (2-2) Yr. Mr. Barnett
Prerequisite: 12 units in education with teaching experience and consent of the instructor.
231. Administration of Elementary Education Practicum. (2) I. Mr. Kyte
Admission on consultation with the instructor.
- 232A-232B. The Elementary School Curriculum Seminar. (2-2) Yr. Mr. Russell
Admission on consultation with the instructor.
- 233A-233B. Supervision of Elementary Education Practicum. (2-2) Yr. Mr. Kyte
Admission on consultation with the instructor.
- 234A-234B. Supervision of Elementary Education Seminar. (2-2) Yr. Mr. Kyte
Admission on consultation with the instructor.
235. The Elementary School Curriculum. (2) II. Mr. Kyte
Admission on consultation with the instructor.
237. Trends in Elementary Education. (2) II. 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.

* Not to be given, 1951-1952.

- 240A-240B. Educational Administration Seminar. (2-2) Yr.
Mr. Bretsch, Mr. Morphet, Mr. Reller
Admission on consultation with the instructor.
244. Problems in Schoolhousing. (2) I and II. Mr. Reller
Prerequisite: course 248A-248B or extensive experience in school administration.
- 245A-245B. Problems in Public School Finance and Business Administration. (2-2) Yr. Mr. Morphet
Prerequisites: course 140 or 141, and 142, and teaching experience.
Historical background, structure, methods and problems of financing public education; public school business administration, policies, and procedures.
246. Personnel Administration in School Systems. (2) II. Mr. Bretsch
Prerequisite: courses 141 and 142.
Organization for personnel administration. Study of problems involved in administration of services pertaining to certificated and non-certificated personnel such as: selection, placement, transfer, welfare, remuneration, morale, organizations.
- 248A-248B. Educational Administration. (2-2) Yr.
Mr. Reller, Mr. Morphet
Prerequisite: 12 units of education or extensive teaching and administrative experience.
Intended to serve the fundamental needs of state, county, and city superintendents or other school administrative officers.
- 249A-249B. School Surveys Practicum. (2-2) Yr. Mr. Reller, Mr. Bretsch
Limited to students enrolled in course 248A-248B.
Training in the practical application of the principles and technique developed in the companion course (248A-248B) including additional field work equivalent to two hours per week. Opportunity to organize and participate in the conduct of school surveys and field studies.
- 258A-*258B. Seminar in Social Studies Education. (2-2) Yr.
Prerequisite: consent of the instructor. Mr. Michaelis
Research on problems in social studies education for advanced students.
- 260A-260B. Seminar in Student Personnel Work. (2-2) Yr. _____
Prerequisite: course 164 and consent of the instructor.
Research in the field of student personnel.
264. Organization and Administration of Student Personnel Services. (2) II.
Prerequisite: course 164 and consent of the instructor. _____
Allocation of functional responsibilities; staff and line relationships; individual and group methods. Problems of budgeting, staffing, and equipping the program; record keeping and office management. Coordination of institutional and community resources.
267. Advanced Counseling. (2) II. _____
Prerequisite: course 162 and consent of the instructor.
Psychological foundations of counseling; diagnostic procedures and treatment; evaluation of counseling. Illustrative case materials.
- 270A-270B. Secondary Education Seminar. (2-2) Yr. Mr. Lund, Mr. Loban
Admission on consultation with the instructor.

* Not to be given, 1951-1952.

- 272A. Secondary School Curriculum: Basic Principles. (2) I. Mr. Parker
Prerequisite: courses 110, 111, 170, or their equivalents, graduate standing, and consent of the instructor.
- 272B. Secondary School Curriculum: Techniques of Curriculum Making. (2) II. Mr. Parker
Prerequisite: course 272A, graduate standing, and consent of the instructor.
273. Supervision in Secondary Schools. (2) I and II. Mr. Lund
Prerequisite: course 130 or 170, teaching experience, and consent of the instructor.
275. Secondary Education: Survey. (2) I and II. Mr. Lund
Survey and critical review of secondary education literature, including research studies, yearbooks, reports, and other documents. Admission on consultation with the instructor.
276. The Administration of Secondary Education Practicum. (2) I. Mr. Bretsch
Prerequisite: courses 170 and 141 or 142.
279. The Junior College Practicum. (2) I and II. Mr. Spindt
- *281. Adult Education Seminar. (2) I and II. _____
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 the solution of one of these problems or of a problem which confronts them in their work.
284. Counseling, Child Welfare, and Parent Education. (2) I. _____
For counselors, supervisors of attendance and child welfare, and school administrators.
285. Social Development of Children and Youth. (2) I. Mr. Tyler
Admission on consultation with the instructor.
- *290. Biological Foundations of Education. (2) I. _____
298. Directed Research. Seminar. (2-4) I and II. _____
The Staff (Mr. Brownell in charge)
Admission only with consent of the instructor in charge.
Open only to candidates for the Ph.D. and Ed.D. degrees who have passed the departmental qualifying examinations and who present an approved plan of research, and in special cases, to students who present evidence of qualifications and approved plans for carrying on a particular type of research.

Supervised Teaching

320. Secondary Supervised Teaching, Professional Methods. I and II.
Mr. Michaelis, 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.
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 course 320A, and must have graduate status.

* Not to be given, 1951-1952.

320A. Secondary Supervised Teaching. (3) I and II.

Mr. Michaelis, 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. Students must reserve a three-hour period daily. Applications for admission to this course must have been made in Room 107, Haviland Hall, not later than April 2, 1951, for the fall semester, 1951; and must be made not later than November 5, 1951, for the spring semester, 1952; and not later than April 7, 1952, for the fall semester, 1952. Enrollment is limited to available facilities.

320B. Audio-Visual Instructional Materials and Techniques. (2) I and II.

Mr. Foster

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

Prerequisite: courses 110, 111, and 320A.

Course 320B must be taken the semester preceding 320A.

Theoretical and psychological factors; implications of research studies; operation of equipment; selection, evaluation, and utilization of materials; preparation of handmade slides, graphic displays, opaque projection, simple duplicated and fugitive materials; services of audio-visual departments.

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

Mr. Michaelis, 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. Applications for admission to this course must be made in Room 107, Haviland Hall, not later than April 2, 1951, for the fall semester, 1951; not later than November 5, 1951, for the spring semester, 1952; and not later than April 7, 1952, for the fall semester, 1952.

320E. Methods of Teaching. (2) I and II.

Mr. Michaelis and Supervisory Staff

Lectures, conferences, and laboratory.

All students enrolled in 320A, 324, or 326 must carry concurrently one of the following sections:

Sec. 1. Agriculture (at Davis).

Mr. Sutherland

Sec. 2. Life Science and Physical Science.

Mr. Polson

Sec. 3. Mathematics.

Mr. Hoge

Sec. 4. English.

Miss Ryan, Mr. Loban, Mr. Squire

Sec. 5. Foreign Languages.

Mrs. Goldberg

*Sec. 6. Latin.

Sec. 7. Social Studies.

Mrs. Jaggard, Miss Ogden, Miss Stewart

Sec. 8. Physical Education for Men.

Mr. Hindman

Sec. 9. Physical Education for Women.

Miss Wagenet

Sec. 10. Art.

Miss Hole

Sec. 11. Homemaking.

Mrs. Oatman

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. 14. German.

* Not to be given, 1951-1952.

Sec. 16. Junior College.

Mr. Conrad

*Sec. 17. Special Education.

Admission on approval of instructor. Hours to be arranged.

School Library Administration (Librarianship 206).

Miss Boyd

A course in school library administration is required of all candidates applying for Special Secondary Credential in Public School Librarianship. This course must be taken in addition to course 320E to fulfill the requirements for the General Secondary Credential.

323. Practicum in Supervised Teaching. (2-4) I and II.

Mr. Conrad

Sec. 1, Mr. Conrad; Sec. 2 (at Davis), Mr. Sutherland.

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.

324. Junior College Supervised Teaching. (4) I and II.

Mr. Conrad

Prerequisite: course 279, which may be taken concurrently if circumstances require. Course 320E, sec. 16, must be taken concurrently.

Conferences, observation, and supervised teaching.

Sec. 1. Limited to teaching assistants employed by the University.

Sec. 2. Open to all other candidates for the Junior College Credential.

*325. Field Work in Student Personnel Services. (2) II.

Prerequisite: courses 164, 267, and consent of the instructor.

Supervised field work in schools and other community agencies.

330. Elementary Supervised Teaching, Professional Methods. I and II.

Mr. Michaelis, Mr. Dumas, Mr. Barnett, 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.

330A. Introduction to Elementary Teaching. (2) I and II.

I. Mr. Barnett, Mr. Kyte, and Supervisors. II. Mr. Kyte, Mr. Russell, and Supervisors.

Lectures, conferences, laboratory, and field work.

Observations and participation in some form of public school work. It is strongly recommended that students reserve at least a two-hour period for field work at least three times a week. Application for admission to course 330A must have been made in Room 107, Haviland Hall, not later than April 2, 1951, for the fall semester, 1951; and must be made not later than November 5, 1951, for the spring semester, 1952; and not later than April 7, 1952, for the fall semester, 1952. Enrollment is limited to available facilities.

330C. Elementary Supervised Teaching. (6) I and II.

Mr. Michaelis, Mr. Dumas, and Supervisory Staff

Prerequisite: courses 110, 111, 130, 131, 132, 134, 138, 330A; Decorative Art 16A; Music A, 27A; History 189A or 189B; Physical Education 26 (Section on Elementary School Skills).

Conferences, observation, and supervised teaching.

* Not to be given, 1951-1952.

- 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. Basic Speech Development. (2) II. Mrs. Gifford
 Prerequisite: course 110.
 Designed to familiarize classroom teachers and administrators with the development of normal speech. Methods and procedures for preventing poor and defective speech habits in children.
- *379. Educational Treatment of Cerebral Palsied Children. (2) II. _____
 Admission only on consultation with the instructor.

COURSES IN OTHER DEPARTMENTS ACCEPTED AS ELECTIVES FOR CREDENTIAL IN EDUCATION

- English 300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I and II.
- Librarianship 206. School Library Administration. (2) II.
- Mathematics 107. Mathematics in Secondary Schools. (2) I.
- Music 300A. Choral Literature for Secondary Schools. (2) I.
- Music 300B. Instrumental Literature for Secondary Schools. (2) II.
- Music 328. Methods of Teaching Vocal Techniques. (1) I and II.
- Music 329A. Methods of Teaching Stringed Instruments. (1) I and II.
- Music 329B. Methods of Teaching Brass Instruments. (1) I.
- Music 329C. Methods of Teaching Wood-Wind Instruments. (1) II.

* Not to be given, 1951-1952.

ENGINEERING

Everett D. Howe, M.S., *Professor of Engineering (Vice-Chairman of the Department)*.

Morrrough P. O'Brien, B.S., *Professor of Engineering (Chairman of the Department)*.



Herbert V. Wiley, B.S., *Lecturer in Engineering*.

CIVIL ENGINEERING AND IRRIGATION

Harmer E. Davis, M.S., *Professor of Civil Engineering, and Director of the Institute of Transportation and Traffic Engineering*.

Raymond E. Davis, C.E., D.Eng., *Professor of Civil Engineering and Director of the Engineering Materials Laboratory*.

Howard D. Eberhart, M.S., *Professor of Civil Engineering*.

Francis S. Foote, E.M., *Professor of Railroad Engineering*.

Harold B. Gotaas, Sc.D., *Professor of Sanitary Engineering (Chairman of the Division of Civil Engineering and Irrigation)*.

Bruce Jameyson, B.S., *Professor of Civil Engineering*.

Joe W. Kelly, B.S., *Professor of Civil Engineering*.

Wilfred F. Langelier, M.S., *Professor of Sanitary Engineering*.

Ralph A. Moyer, M.S., C.E., *Professor of Civil Engineering*.

Thomas R. Simpson, B.S., *Professor of Irrigation Engineering*.

George E. Troxell, B.S., *Professor of Civil Engineering*.

Clement T. Wiskocil, C.E., *Professor of Civil Engineering*.

Charles Derleth, Jr., C.E., LL.D., *Professor of Civil Engineering, Emeritus*.

Bernard A. Etcheverry, B.S., *Professor of Irrigation and Drainage, Emeritus*.

Sidney T. Harding, B.S., *Professor of Irrigation, Emeritus*.

Charles G. Hyde, B.S., LL.D., *Professor of Sanitary Engineering, Emeritus*.

Tung-yen Lin, M.S., *Associate Professor of Civil Engineering*.

Harvey F. Ludwig, M.S., *Associate Professor of Sanitary Engineering*.

Egor P. Popov, Ph.D., *Associate Professor of Civil Engineering*.

Bernard D. Tebbens, Sc.D., *Associate Professor of Industrial Hygiene Engineering*.

Boris Bresler, M.S., *Assistant Professor of Civil Engineering*.

Ray W. Clough, Jr., Sc.D., *Assistant Professor of Civil Engineering*.

▽ Frederick L. Hotes, M.S., *Assistant Professor of Irrigation*.

John Hugh Jones, M.S., *Assistant Professor of Civil Engineering*.

Francis H. Moffitt, M.C.E., *Assistant Professor of Civil Engineering*.

Erman A. Pearson, Sc.D., *Assistant Professor of Sanitary Engineering*.

David Pirtz, M.S., *Assistant Professor of Civil Engineering*.

Milos Polivka, M.S., *Assistant Professor of Civil Engineering*.

Alexander C. Scordelis, M.S., *Assistant Professor of Civil Engineering*.

Harry B. Seed, Ph.D., *Assistant Professor of Civil Engineering*.

Cameron M. Smith, Ph.D., *Assistant Professor of Civil Engineering*.

Bernard A. Vallergera, M.S., *Assistant Professor of Civil Engineering*.

Charles F. Scheffey, M.S., *Instructor in Civil Engineering*.



Lloyd C. Fowler, B.S., *Lecturer in Civil Engineering*.

- Alexander Klein, M.S., *Lecturer in Civil Engineering.*
 Edward Q. Moulton, M.S., *Lecturer in Civil Engineering.*
 Frank A. Nikirk, B.S., *Visiting Professor of Civil Engineering.*
 David K. Todd, M.S., *Lecturer in Civil Engineering.*
 Edwin A. Wells, Jr., M.S., *Lecturer in Civil Engineering.*

ELECTRICAL ENGINEERING

- Leonard J. Black, Ph.D., *Professor of Electrical Engineering.*
 Charles F. Dalziel, E.E., *Professor of Electrical Engineering.*
 Thomas C. McFarland, M.S., *Professor of Electrical Engineering (Chairman of the Division).*
 Lauriston C. Marshall, Ph.D., *Professor of Electrical Engineering.*
 Lester E. Reukema, Ph.D., *Professor of Electrical Engineering.*
 Burtis L. Robertson, Ph.D., *Professor of Electrical Engineering.*
 Samuel Silver, Ph.D., *Professor of Electrical Engineering.*
 Dan M. Finch, B.S., *Associate Professor of Electrical Engineering.*
 Troy D. Graybeal, D.Eng., *Associate Professor of Electrical Engineering.*
 Paul L. Morton, Ph.D., *Associate Professor of Electrical Engineering.*
 Herbert J. Scott, E.E., *Associate Professor of Electrical Engineering.*
 David H. Sloan, Ph.D., *Associate Professor of Electrical Engineering.*
 Otto J. M. Smith, Ph.D., *Associate Professor of Electrical Engineering.*
 *John R. Whinnery, Ph.D., *Associate Professor of Electrical Engineering.*
 John R. Woodyard, Ph.D., *Associate Professor of Electrical Engineering.*
 Wilton R. Abbott, Ph.D., *Assistant Professor of Electrical Engineering.*
 Robert A. Bruns, M.S., *Assistant Professor of Electrical Engineering.*
 Wilson S. Pritchett, M.S., *Assistant Professor of Electrical Engineering.*
 Robert M. Saunders, M.S., *Assistant Professor of Electrical Engineering.*



- John D. Axtell, B.S., *Lecturer in Electrical Engineering.*
 Dwight W. Brede, M.S., *Lecturer in Electrical Engineering.*
 James R. Freeman, M.S., *Lecturer in Electrical Engineering.*
 Joseph T. Gier, M.S., *Lecturer in Electrical Engineering.*
 Swegn D. Hamren, M.S., *Lecturer in Electrical Engineering.*
 ♡Karl Hinrichs, M.S., *Lecturer in Electrical Engineering.*
 Wolfgang Kummer, M.S., *Lecturer in Electrical Engineering.*
 Ralph S. MacKay, A.B., *Lecturer in Electrical Engineering.*
 Torben H. Meisling, M.S., *Lecturer in Electrical Engineering.*
 Charles H. Papas, Ph.D., *Lecturer in Electrical Engineering.*
 George K. Tajima, M.S., *Lecturer in Electrical Engineering.*
 George F. Teale, B.S., *Lecturer in Electrical Engineering.*
 Ferdinand Voelker, M.S., *Lecturer in Electrical Engineering.*

ENGINEERING DESIGN

- Clyne F. Garland, M.S., *Professor of Engineering Design (Chairman of the Division).*
 Alexander S. Levens, M.S., C.E., *Professor of Engineering Design.*
 Walter W. Soroka, Sc.D., *Professor of Engineering Design.*
 Eneas D. Kane, Ph.D., *Associate Professor of Engineering Design.*

* Absent on leave, 1951-1952.

♡ On military leave, 1951-1952.

- James L. Meriam, Ph.D., *Associate Professor of Engineering Design.*
 Carl W. Nelson, Ph.D., *Associate Professor of Engineering Design.*
 Garland W. Brown, M.S., *Assistant Professor of Engineering Design.*
 Don M. Cunningham, M.S., *Assistant Professor of Engineering Design.*
 Werner Goldsmith, Ph.D., *Assistant Professor of Engineering Design.*
 *William S. Rouverol, M.S., *Assistant Professor of Engineering Design.*
 Cyril P. Atkinson, M.S., *Instructor in Engineering Design.*
 Joseph Frisch, M.S., *Instructor in Engineering Design.*
 William W. Howe, M.S., *Instructor in Engineering Design.*



- Clinton J. Ancker, M.S., M.E., *Lecturer in Engineering Design.*
 Kenneth E. Barnhart, M.S., *Lecturer in Engineering Design.*
 Francis R. Berry, Jr., M.S., *Lecturer in Engineering Design.*
 George E. Davis, M.A., *Lecturer in Engineering Design.*
 Albert L. Hale, M.S., *Lecturer in Engineering Design.*
 Charles W. Radcliffe, M.S., *Lecturer in Engineering Design.*
 Jay Scheinman, B.Eng., *Lecturer in Engineering Design.*
 Winfield W. Sisson, U.S.M.A., *Lecturer in Engineering Design.*

MECHANICAL ENGINEERING

- E. Paul DeGarmo, M.S., *Professor of Mechanical Engineering.*
 Richard G. Folsom, Ph.D., *Professor of Mechanical Engineering (Chairman of the Division).*
 † Francis W. Hutchinson, M.S., M.E., *Professor of Mechanical Engineering.*
 Henry A. Schade, Dr. Ing., *Professor of Mechanical Engineering.*
 † Leonid Michael Tichvinsky, D.E.M., *Professor of Mechanical Engineering.*
 Carl J. Vogt, M.S., *Professor of Mechanical Engineering.*
 Baldwin M. Woods, Ph.D., *Professor of Mechanical Engineering.*
 Floyd H. Cherry, B.S., *Associate Professor of Mechanical Engineering, Emeritus.*
 Alexander Boodberg, M.S., M.E., *Associate Professor of Mechanical Engineering.*
 Hans Albert Einstein, D.S.T., *Associate Professor of Mechanical Engineering.*
 Leonard Farbar, M.S., *Associate Professor of Mechanical Engineering.*
 Harold W. Iversen, M.S., *Associate Professor of Mechanical Engineering.*
 Harold A. Johnson, M.S., *Associate Professor of Mechanical Engineering.*
 Joe W. Johnson, M.S., *Associate Professor of Mechanical Engineering.*
 Edward C. Keachie, Ph.D., *Associate Professor of Mechanical Engineering.*
 Edmund V. Laitone, M.A., *Associate Professor of Mechanical Engineering.*
 Samuel A. Schaaf, Ph.D., *Associate Professor of Engineering Science.*
 Ralph A. Seban, Ph.D., *Associate Professor of Mechanical Engineering.*
 Paul B. Stewart, Ph.D., *Acting Associate Professor of Mechanical Engineering.*
 Erich G. Thomsen, Ph.D., *Associate Professor of Mechanical Engineering.*
 √ Martin B. Biles, M.S., M.E., *Assistant Professor of Mechanical Engineering.*
 James S. Campbell, M.M.E., *Assistant Professor of Mechanical Engineering.*

* Absent on leave, 1951-1952.

† In residence fall semester only, 1951-1952.

‡ In residence spring semester only, 1951-1952.

√ On military leave, 1951-1952.

Israel I. Cornet, Ph.D., *Assistant Professor of Mechanical Engineering.*
 Louis E. Davis, M.S., *Assistant Professor of Mechanical Engineering.*
 Robert M. Drake, Jr., Ph.D., *Assistant Professor of Mechanical Engineering.*
 Robert V. Dunkle, M.S., *Assistant Professor of Mechanical Engineering.*
 Rostislav A. Galuzevski, M.S., *Assistant Professor of Mechanical Engineering.*

Warren H. Giedt, Ph.D., *Assistant Professor of Mechanical Engineering.*
 Raymond C. Grassi, M.S., *Assistant Professor of Mechanical Engineering.*
 Lawrence M. Grossman, Ph.D., *Assistant Professor of Mechanical Engineering.*

Alan D. K. Laird, M.S., *Acting Assistant Professor of Mechanical Engineering.*

² James T. Lapsley, Jr., M.S., *Assistant Professor of Mechanical Engineering.*
 Donald G. Malcolm, M.S., *Assistant Professor of Mechanical Engineering.*
 Antoni K. Oppenheim, Ph.D., *Assistant Professor of Mechanical Engineering.*

† Nathan W. Snyder, Ph.D., *Assistant Professor of Mechanical Engineering.*

Ernest E. Starkman, M.S., *Assistant Professor of Mechanical Engineering.*

Andrew F. Charwat, M.E., *Instructor in Mechanical Engineering.*

William A. Gross, M.S., *Instructor in Mechanical Engineering.*

Frank Kreith, M.A., *Instructor in Mechanical Engineering.*

Bruce G. McCauley, M.B.A., *Instructor in Mechanical Engineering.*

♣ William E. Nero, M.S., *Instructor in Mechanical Engineering.*

Virgil E. Schrock, M.S., *Instructor in Mechanical Engineering.*

William M. Schultz, M.S., *Instructor in Mechanical Engineering.*



Charles H. Cehrs, M.S., *Lecturer in Mechanical Engineering.*

George S. Emmerson, M.S., *Lecturer in Mechanical Engineering.*

Richard A. Fayram, M.S., *Lecturer in Mechanical Engineering.*

David C. Ipsen, B.S.E., *Lecturer in Mechanical Engineering.*

Frank L. Maker, M.E., *Lecturer in Mechanical Engineering.*

Roland W. Pinger, M.E., *Lecturer in Mechanical Engineering.*

Laurens Troost, Ph.D., *Visiting Professor of Mechanical Engineering.*

MINERAL TECHNOLOGY

Anders J. Carlson, C.E., Ph.D., *Professor of Petroleum Engineering (Chairman of the Division of Mineral Technology).*

John E. Dorn, Ph.D., *Professor of Metallurgy.*

Ralph R. Hultgren, Ph.D., *Professor of Metallurgy.*

Earl R. Parker, Met.E., *Professor of Metallurgy.*

S. Frederick Ravitz, Ph.D., *Professor of Metallurgy.*

Lysle E. Shaffer, M.E., *Professor of Mining.*

Lester C. Uren, B.S., *Professor of Petroleum Engineering.*

Edward H. Wisser, B.S., *Professor of Mineral Exploration.*

Joseph A. Pask, Ph.D., *Associate Professor of Ceramics.*

John A. Putnam, Ph.D., *Associate Professor of Petroleum Engineering.*

Bernard York, E.M., *Associate Professor of Mining.*

² In residence spring semester only, 1951-1952.

† Sabbatical leave in residence, 1951-1952.

♣ On military leave, 1951-1952.

David W. Mitchell, Ph.D., *Assistant Professor of Metallurgy.*

*Richard D. Potter, Sc.D., *Assistant Professor of Metallurgy.*

Wilbur H. Somerton, Pet.E., *Assistant Professor of Petroleum Engineering.*



Kenneth K. Kelley, Ph.D., *Lecturer in Metallurgy.*

Frank G. Miller, Ph.D., *Lecturer in Mineral Technology.*

TRANSPORTATION ENGINEERING

Donald S. Berry, Ph.D., *Professor of Transportation Engineering.*

Harmer E. Davis, M.S., *Professor of Civil Engineering (Chairman of the Division of Transportation Engineering).*

Ralph A. Moyer, M.S., C.E., *Professor of Civil Engineering.*



▽Fred N. Finn, B.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.*

▽Cecil J. Van Til, M.S.C.E., *Lecturer in Transportation Engineering.*

Inspection trips may be a part of the academic program of any course given by the divisions of the Department of Engineering.

Lower division courses in the Department of Engineering which are of general interest to students in various curricula are listed under Engineering.

ENGINEERING

LOWER DIVISION COURSES

1A-1B. Plane Surveying. (3-3) Yr. Beginning each semester.

The Staff (Mr. Foote in charge)

Prerequisite: trigonometry and one high school unit in mechanical drawing.

Principles; field practice; calculations and mapping.

1AX-1BX. Supplementary Course in Plane Surveying: Field Work. (1-1) Yr. Beginning each semester.

The Staff (Mr. Foote in charge)

Open only to students entering the colleges at Berkeley with 2 units of credit for recitations and lectures in course 1A-1B.

8. Materials of Engineering Construction. (2) I and II.

The Staff (Mr. Kelly in charge)

Prerequisite: sophomore standing in civil engineering.

Structural properties and adaptability of various materials.

18A-18B. Strength of Materials. (3-3) Yr. Beginning each semester.

The Staff (Mr. Kelly in charge)

For students in architecture. Prerequisite: Mathematics 3B, Physics 2A and 3A or 4A, course 21.

Elementary analytic mechanics; application of statics and theory of elasticity to elements of structural design.

21. Plane Surveying. (3) I and II.

Mr. Todd, Mr. Moffitt

Lectures and field work.

Prerequisite: trigonometry and one high school unit in mechanical drawing.

* Absent on leave, 1951-1952.

▽ On military leave, 1951-1952.

ing. 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. The Staff (Mr. Levens in charge)
Lectures and laboratory.

Prerequisite: plane geometry, trigonometry, and mechanical drawing.

Freehand pictorials; theory of orthogonal projection; single and multiple auxiliaries; dimensioning; freehand and mechanical working drawings; graphic computations; plotting experimental data and determination of elementary empirical equations.

23. Descriptive Geometry. (2) I and II. The Staff (Mr. Levens in charge)
One lecture and five laboratory hours per week.

Prerequisite: course 22 and Mathematics 3A (may be taken concurrently).

The fundamental principles of descriptive geometry and their application to the solution of three-dimensional problems arising in the various branches of engineering.

24. Advanced Engineering Drawing. (2) I and II.

The Staff (Mr. Levens in charge)

One lecture and five laboratory hours per week.

Prerequisite: course 23.

Cams and gears; working drawings of machine parts; freehand sketching; structural detailing; piping layouts; and introduction of graphic integration and differentiation.

35. Statics. (3) I and II.

The Staff (Mr. Meriam in charge)

Prerequisite: Engineering 23, Physics 4A, Mathematics 4A and 4B (Mathematics 4B may be taken concurrently).

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

I: Mr. Dorn; II: Mr. Hultgren.

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 micro-structure, 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

I: Mr. Dorn; II: Mr. Hultgren.

Prerequisite: same as for course 40.

- 40L. Elementary Metallurgy Laboratory. (1) I and II.

I: Mr. Dorn; II: Mr. Hultgren.

Mr. Dorn, Mr. Hultgren

Prerequisite: course 40K, which may not be taken concurrently.

The laboratory part of course 40.

41. **Manufacturing Processes. (4) II.** The Staff (Mr. DeGarmo in charge)
Two lectures, one demonstration period, and one three-hour laboratory period per week.
Prerequisite: courses 23 and 40; Chemistry 1A; Physics 4A.
Nonmetals; casting processes; gauging; metal cutting; general purpose and production type machine tools; tooling; jigs and fixtures; hot and cold forming; grinding; protective and decorative surface treatments; gas and electric welding; relation of design to production.
42. **Materials and Processes of Manufacturing. (4) I.**
The Staff (Mr. Grassi in charge)
Two lectures, one demonstration period, and one three-hour laboratory period each week.
Prerequisite: course 23, Chemistry 1A, Physics 4A. For students in electrical engineering.
The nature and properties of materials commonly used in manufacturing and their relation to the manufacturing processes. Heat treatment of metals; casting; hot and cold forming; gauging; cutting of metals; shapers; lathes; drill presses, milling machines, grinders; resistance and fusion welding.
48. **The Engineering Student and His Profession. (1) I and II.**
Mr. Woods in charge
Prerequisite: freshman standing in engineering.
History and development of the fields of engineering, the great engineers and their achievements, the engineering profession and modern trends.

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. O'Brien in charge)
Prerequisite: senior standing in engineering. To be taken during the year preceding 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 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; Electrical Engineering 100A, 101, or 110A; Civil Engineering 108A; Engineering Design 102B.
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 the 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. Engineering Photography, Photogrammetry, and Airphoto Interpretation. (2) I. Mr. Moffitt
 Prerequisite: Engineering 1A-1B.
 Two lectures per week covering the principles of photography pertaining to engineering research; photogrammetry; the techniques used in the interpretation of aerial photographs relating to mapping, soil surveys, and drainage studies.
- 102A. Route Surveying. (3) I and II. The Staff (Mr. Foote in charge)
 Lectures and field work.
 Prerequisite: Engineering 1A-1B.
 Simple, compound, and transition curves, reconnaissance, preliminary and location surveys; calculations of earthwork and other quantities; field work.
- 102B. Economics of Railroad Locations. (3) II. Mr. Foote
 Prerequisite: course 102A.
 Influence of location upon earning power, with particular reference to effect of changes in distance, grade, and curvature upon operating expenses; plotting of maps, profiles, and mass diagrams; drafting of railroad structures.
104. Railroad Engineering. (2) I. Mr. Foote
 Prerequisite: course 102B.
 Grading, tunnels, signaling, track, yards, maintenance, line and grade changes.
- †105. Higher Surveying and Geodesy. (2) II. Mr. Foote
 Prerequisite: Engineering 1A-1B.
 Methods of geodetic surveying; adjustment of observation; geodetic positions; map projections.
106. Highway Engineering. (2) I and II. Mr. Moyer, Mr. 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.

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

107A. Framed Structures. (3) I and II.

Mr. R. E. Davis, Mr. Bresler, Mr. Pirtz, Mr. Popov

Prerequisite: course 108A.

Computation of stresses in roofs, building frames, and simple bridge trusses, by algebraic and graphical methods.

107E. Reinforced Concrete Design. (3) I.

Mr. Troxell, Mr. Pirtz

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

Prerequisite: senior standing and courses 112 and 107E (may be taken concurrently).

For architectural students. Stress computations and design of structures in wood, steel, and reinforced concrete, particularly of buildings.

107G. Analysis of Airplane Structures. (3) I and II.

Mr. Eberhart, Mr. Bresler

Prerequisite: course 107A or Engineering Design 106.

Solution of typical stress analysis problems; load requirements; thin web beams; monocoque construction; plate stringer combinations; beam columns; space frames.

108A. Strength of Materials. (3) I and II. The Staff (Mr. Popov in charge)

Prerequisite: Engineering 35.

Elastic and ultimate resistance of materials; stress analysis for bars, beams, columns, and shafts; deflections and combined stresses; elements of design for wood and steel structures.

108C. Civil Engineering Laboratory. (1) I and II.

The Staff (Mr. Troxell in charge)

Prerequisite: Engineering 8 and course 135 (may be taken concurrently).

Principles and methods of testing engineering materials. Physical tests of brick, concrete, iron, steel, and wood.

108E. Concrete Laboratory. (2) I.

The Staff (Mr. Troxell in charge)

Prerequisite: Engineering 8 and course 108A (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 and mechanical 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.

The Staff (Mr. Vallergera in charge)

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. The Staff (Mr. Seed in charge)
Lecture and laboratory.
Prerequisite: senior standing in civil engineering.
Lectures on theoretical soil mechanics with selected experiments on physical and mechanical properties of soils for engineering uses.
- 109A. Sewerage Engineering. (2) I and II. Mr. Gotaas (in charge), Mr. Pearson
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. Mr. Gotaas
Prerequisite: course 111B.
Engineering design of water purification and sewage treatment facilities; includes aeration, coagulation, sedimentation, decomposition, filtration, biology, oxidation and disinfecting processes.
- 111A. Water Supply Engineering. (2) I and II. Mr. Gotaas, Mr. Pearson
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. Lin, Mr. Pirtz
Prerequisite: Engineering 18A-18B.
For students in architecture.
Analytical and graphical stress analysis for framed structures.
113. Foundations. (2) I and II. The Staff (Mr. H. E. Davis in charge)
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. Wiskocil, 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.
A series of problems illustrating practices in civil engineering design and construction, including terminology detailing, preparation of cost estimates and methods of computation.
123. Sanitary Engineering Laboratory. (4) I and II. Mr. Langelier
Prerequisite: Chemistry 1A-1B.
Chemical and bacteriological examination of water and sewage, with particular reference to analytical control of water purification and sewage treatment processes.

124. Principles of Public Health Engineering. (3) II. Mr. Langelier
Prerequisite: upper division standing in engineering and science.
A general course in the engineering approach to problems of municipal sanitation and public health.
125. Environmental Sanitation. (2) I. Mr. Langelier
Prerequisite: Chemistry 1A-1B.
An introduction to the principles of sanitary science. Controls against the contamination of water, air, and food, and insect control.
126. Applied Sanitary Science and Municipal and State Sanitation. (2) II. Mr. Ludwig
Prerequisite: courses 123 and 111B.
133. Elementary Structural Design. (3) I and II. Mr. Lin, Mr. Bresler
Prerequisite: courses 108A.
Design of steel and timber structural components; structural connections, tension and compression members, and beams.
135. Reinforced Concrete. (2) I and II. Mr. Bresler, Mr. Lin
Prerequisite: course 108A.
Elementary analysis and design of reinforced concrete beams, slabs, columns, and footings.
136. Structural Analysis and Design of Bridges. (3) I and II. Mr. Jameyson (in charge), 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. The Staff (Mr. Eberhart in charge)
Prerequisite: courses 107A, 133, and 135.
Analysis and design of building structures under the action of vertical dead and live loads, and of wind and earthquake forces. Building code and structural requirements in connection with the use of timber, steel frame, reinforced concrete, and brick.
147. Sanitary Engineering Chemistry. (3) II. Mr. Tebbens
Prerequisite: course 123 or equivalent.
Lectures, demonstrations, and problems concerning the applications of organic chemistry and biological chemistry to water purification, sewage treatment, agricultural and industrial wastes, and sanitation of the industrial environment.
- *148. Sanitary Engineering Biology. (3) I. _____
Prerequisite: course 123 and Bacteriology 2.
Discussion of the roles of bacteria and certain other organisms in stream pollution and in processes employed for purifying water and disposing of organic wastes, with particular emphasis on bacterial enzymes and bacterial respiration. The role of insects in disease transmission is also considered.
149. Municipal Engineering Services. (2) II. Mr. Ludwig, Mr. 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 the 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.

* Not to be given, 1951-1952.

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. Laird and Mr. J. W. Johnson 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. J. W. Johnson
 Prerequisite: Irrigation 102A.
 Non-uniform 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.
 Street and highway traffic problems; principles of design of thoroughfares on the basis of operational characteristics; traffic regulation and control.
175. Airphoto Analysis and Interpretation. (3) I. Mr. Moffitt
 Prerequisite: senior standing in engineering or geology.
 Three lecture and recitation hours per week covering the principles of aerial photography and photogrammetry; the use of airphotos in identifying land forms, in locating transportation facilities, and in the interpretation of soil and drainage conditions for highway and airport site selection.
181. Engineering Construction. (3) I and II. Mr. Nikirk
 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) I and II. Mr. Kelly
 Prerequisite: junior standing in civil engineering.
 Application of written and oral expression to the preparation of technical reports and articles.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Troxell in charge)
 Prerequisite: senior standing in engineering.
 Group study of a selected topic or topics in civil engineering.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. R. E. Davis in charge)
 Prerequisite: senior standing in engineering.
 Individual study and/or investigation of a subject in civil engineering in which the student has a special interest.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

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.

220. Advanced Structural Analysis and Design. (3) I.
Prerequisite: courses 136 and 137. Mr. Jameyson, Mr. Scordelis
Lectures and computations in the analysis of statically indeterminate structures by moment distribution, column analogy, and other methods; design of building frames for wind and earthquake loadings.
221. Experimental Structural and Stress Analysis. (3) II.
Prerequisite: courses 136 and 137. Mr. Eberhart, Mr. Clough
Lectures and laboratory in the principal experimental methods used for structural and stress analysis, including similitude and loaded models, elastic line models, mechanical and electrical strain gauging, stress coat analysis, analogy methods, and photoelasticity.
- 222A–222B. Theory and Design of Water and Sewage Treatment. (3–3) Yr.
Prerequisite: courses 109A and 111A. Mr. Gotaas
Theory and design of elements of systems for water supply, water purification, sewerage, sewage and refuse treatment and disposal.
224. Design of Thin-Sheet Structures. (3) II. Mr. Bresler
Prerequisite: graduate standing. Seniors majoring in structural engineering may be admitted to the course with consent of the instructor.
Design specifications, materials of construction, fabrication methods, stress analysis, and design of thin-sheet structures.
225. Advanced Sanitary Engineering Laboratory. (3) II. Mr. Langelier
Prerequisite: course 123. Program to be arranged in each case.
Special laboratory problems in analysis of milk, water, sewage, air, and refuse; tests of plant models and commercial apparatus.
- 230A–230B. Advanced Mechanics of Materials. (3–3) Yr. Mr. Popov
Prerequisite: graduate standing. Course 230A is not prerequisite to 230B.
Failure theories; inelastic bending; limit design; thick-walled cylinders; torsion of noncircular elements; design for fluctuating and sustained loads; application of theory of elasticity to some complex states of stress; curved bars; elastic stability; plates; beams on elastic foundations.
235. Analysis and Design of Masonry Dams. (3) II. Mr. Smith, Mr. Seed
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-butress 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.
Prerequisite: courses 111B and 123. Mr. Pearson
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 in charge
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. R. E. Davis
Prerequisite: courses 108E, 135, and graduate standing.
Lectures and seminars. Consideration of broad aspects of concrete construction; technical requirements; selection of materials; control of quality; practices in the construction of dams, highways, airfields, canals, bridges, buildings, hydraulic structures.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
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.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.
The Staff (Mr. Eberhart in charge)
Prerequisite: graduate standing.
Investigation of selected advanced civil engineering subjects.

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.

For other courses in irrigation, see under Agriculture in earlier pages of this bulletin and in the PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

UPPER DIVISION COURSES

The 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, Lower Division. Additional prerequisites are indicated.

101. Irrigation Institutions and Economics. (2) II. Mr. Simpson
Prerequisite: course 103 or 113.
Water rights, irrigation institutions and organizations.
- 102A. Irrigation Engineering. (2) I and II. Mr. Simpson
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. Fowler
Prerequisite: course 102A (may be taken concurrently).
Principles of design of diversion weirs, headworks, wasteways, sand boxes, falls, checkgates, lateral headgates, road crossings, special types of distribution systems, measuring devices.
103. Agricultural Use of Water, and Irrigation Practice. (2) I and II.
Prerequisite: junior standing. Mr. Simpson
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) I. Mr. Simpson
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 1951-1952 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. Mr. Fowler
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, 1951-1952.

*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 1951-1952 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. Simpson 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. Simpson in charge)

Prerequisite: senior standing in engineering.

Individual study and/or research on a problem normally chosen from a restricted list. Enrollment is subject to the scholarship requirements imposed by the instructor concerned.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

202. Advanced Irrigation Design. (2) I and II.

Mr. Simpson

Prerequisite: course 112.

Design of diversion works, irrigation systems, special hydraulic structures.

298. Group Studies. Seminars or Group Research. (1-5) I and II.

The Staff (Mr. Simpson in charge)

Prerequisite: graduate standing.

Special studies and problems relating to drainage, reclamation, and flood protection; irrigation institutions and organizations; development and utilization of water supplies.

299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.

The Staff (Mr. Simpson in charge)

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. Teale, Mr. Black

Prerequisite: Mathematics 14A or 4A-4B; Physics 1C or 4B.

Required for students in agricultural, industrial, and mechanical engineering.

100A. Voltage generation; circuit constants; single-phase and poly-phase circuit analysis; single-phase transformers; polyphase connections of transformers.

* Not to be given, 1951-1952.

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. Brede, Mr. Teale
Open to engineering students not registered in agricultural, electrical, industrial, or mechanical engineering.

Prerequisite: Mathematics 4A, Physics 1C or Physics 4B.

Electric power generation, transmission, distribution, and utilization.

102. Electrical Engineering Laboratory. (1) I and II. Mr. Teale
One three-hour period per week to be arranged. Sections limited to fifteen students.

Prerequisite: course 101, which should be taken concurrently if possible.

Experiments designed to illustrate electrical theory and afford practice in the operation of electrical equipment. Designed to accompany and supplement course 101.

- 103A-103B. Engineering Design of Particle Accelerators. (2-2) Yr.

Prerequisite: junior or senior standing in engineering. Mr. Marshall

Course 103A is normally prerequisite to 103B. Qualified students may enroll in course 103B without 103A with consent of the instructor.

Design factors, and applications of modern nuclear machines such as cascade transformers, impulse generators, Van De Graaf generators, betatrons, cyclotrons (synchro-cyclotron), and linear accelerators.

- 104A-104B. Electrical Laboratory. (1-1) Yr. Beginning each semester.

The Staff (Mr. Robertson in charge)

One three-hour laboratory period per week.

Prerequisite: course 100A-100B or 110A-110B (may be taken concurrently).

Introductory experiments illustrating principles of design and operation of alternating- and direct-current motors and generators, transformers, vacuum tubes, single and polyphase circuits, metering and control equipment.

105. Electrical Measurements in Engineering. (3) I and II.

The Staff (Mr. Pritchett in charge)

Two lectures and one three-hour laboratory period per week.

Prerequisite (may be taken concurrently): course 100A, or 101 and 102, or 110A; Mathematics 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. Morton 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).

Electron emission; motion of charges in electromagnetic fields; electrical conduction in vacuum and through gases; electron tubes, high-vacuum and gas-filled; elementary applications of electronic devices in rectifiers and amplifiers.

- 110A-110B. Advanced Electrical Machinery. (3-3) Yr. Beginning each semester.

The Staff (Mr. McFarland in charge)

Prerequisite: Mathematics 14A or 4A-4B; Physics 1C or 4B.

Required for students in electrical engineering.

110A. Single-phase alternating current circuits.

110B. Polyphase circuits, magnetic circuits, transformer theory.

111A–111B. Advanced Electrical Machinery. (3–3) Yr.

The Staff (Mr. McFarland in charge)

Prerequisite: courses 104A–104B, 106 (for 111A 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. Reukema, Mr. Scott, Mr. Abbott

Prerequisite: course 106, Mathematics 110, and senior standing in electrical or mechanical engineering.

Design and operating characteristics of radio transmitters and receivers for amplitude modulation, frequency modulation, television and radar; propagation of electromagnetic waves and the design of antennas and antenna arrays.

117A–117B. Electromagnetic Fields and Waves. (3–3) Yr.

Mr. Papas, Mr. Silver

Prerequisite: course 106 and Mathematics 110.

The mathematics of vector fields, static electric and magnetic fields. Maxwell's equations. Applications to problems in wave propagation, skin effect, wave guides and cavity resonators, electromagnetic radiation, and ultra-high-frequency technique.

118A–118B. Power System Protection. (2–2) Yr.

Mr. Dalziel

Prerequisite: course 111A (may be taken concurrently).

Symmetrical components, analysis of short circuits, decrement curves, power system protection, instrument transformers, and metering errors.

122A–122B. Electric Power Transmission and Distribution. (3–3) Yr.

Prerequisite: course 110A–110B and Mathematics 110. Mr. Freeman

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. Reukema

Prerequisite: course 106 and senior standing in electrical or mechanical engineering.

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. The Staff (Mr. Bruns in charge)

Prerequisite: course 106.

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. Automatic Regulators. (4) I. The Staff (Mr. Graybeal in charge)
 Three lectures and one three-hour laboratory period per week.
 Prerequisite: courses 110A-110B or 100A-100B, and 104A-104B.
 Basic principles of regulators; function and characteristics of component parts; steady-state and transient theory; criteria for and methods of obtaining stability; applications to voltage, current, speed, and torque regulators; positioning controls; servomechanisms.
- 132A. Electrical Communications Laboratory. (2) I and II. The Staff (Mr. Scott in charge)
 Prerequisite: courses 104A-104B, 110A-110B completed; and 116A (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; 116B and 117B or 123B (to be taken concurrently).
 Selected experiments illustrating the fundamentals of electronics and the generation, propagation, and radiation of electro-magnetic energy. Particular consideration is given to the ultra-high-frequency and microwave regions.
- 133A. Electrical Machinery Laboratory. (2) I and II. The Staff (Mr. Saunders in charge)
 Prerequisite: courses 104B, 105, 110A-110B, 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 (Mr. Saunders in charge)
 Prerequisite: course 133A; 111B (may be taken concurrently).
 Advanced experiments on a-c and d-c machinery.
135. Control of Electric Motors. (3) II. The Staff (Mr. Graybeal in charge)
 Two lectures and one three-hour laboratory period per week.
 Prerequisite: courses 110A-110B or 100A-100B, and 104A-104B.
 Design, construction, and operation of electromagnets, relays, electronic control devices, switching circuits, and motor controllers.
140. Illumination Engineering. (3) I. Mr. Finch
 Two lectures and one three-hour laboratory period per week.
 Prerequisite: senior standing in electrical engineering or consent of the instructor.
 Photometric concepts; engineering aspects of light; measurements, instruments, and techniques for lighting studies; light and vision; color specifications; design of lighting installations. Laboratory experiments and demonstrations.
141. Illumination and Radiation. (3) II. Mr. Finch
 Two lectures and one three-hour laboratory period per week.
 Prerequisite: senior standing in electrical engineering or consent of the instructor.

Thermal radiation, luminescence, ultraviolet radiation and infrared radiation, solar heating calculations, and design problems. Surface sources, interreflections. Germicidal, erythematous, and fading properties of ultraviolet radiations. Special problems in infrared transmitters, receivers, and applications. Design of typical installations.

142. Advanced Illuminating Engineering. (2) II. Mr. Finch
Prerequisite: course 140 or equivalent. Recommended: course 141 (may be taken concurrently).
Lighting design and layouts for typical installations. Conditions for effective seeing for specific tasks. Lighting calculations and arrangements of multiple sources. Effective utilization of daylighting. Specific lighting problems. Student projects in design and modifications based on surveys.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. McFarland in charge)
Prerequisite: senior standing in engineering.
Group study of selected topics. Study groups may be organized in advanced electrical engineering subjects.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. McFarland in charge)
Prerequisite: senior standing in engineering.
Individual study and/or research on a problem chosen from a restricted list. Enrollment is subject to the scholarship requirements imposed by the instructor concerned.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- 200A-200B. Research Literature. (2-1) Yr. The Staff (——— in charge)
200A will be offered in both the fall and spring semesters; 200B will be offered in the spring semester only.
Prerequisite: graduate standing. This course must precede or accompany graduate research in electrical engineering.
Individual study of the historical background and present status of research in the field of special interest to each student, culminating in written and oral reports presented to the staff and students of electrical engineering.
- *206. Theory of High Frequency Tubes. (3) I. _____
Prerequisite: courses 116A-116B, 117A-117B, and graduate standing.
A study of the interchange of energy between electromagnetic fields and various electron streams operating under transit time conditions, with applications to the theory of space-charge controlled tubes, velocity modulation tubes, magnetrons, and traveling wave tubes.
- 216A-216B. Microwave Antennas. (3-3) Yr. Mr. Papas
Prerequisite: courses 116A-116B, 117A-117B, Mathematics 119A-119B.
Fundamental principles underlying the design of microwave antennas; radiation from current distributions; propagation, scattering, and diffraction of electromagnetic waves. Applications to the design of microwave arrays, pencil-beam, and shaped-beam antennas.

* Not to be given, 1951-1952.

217. Microwave Networks. (3) II. Mr. Papas
 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: graduate standing in electrical engineering. Recommended: course 123A-123B or 117A-117B.
 Analysis of vibrating systems; principles and apparatus involved in the production, propagation, measurement, and reception of sound.
221. Transient Phenomena. (2) I. Mr. Robertson
 Prerequisite: graduate standing in engineering, mathematics, or physics. Seniors with superior records may enroll with consent of the instructor.
 Physical and mathematical analysis of transient phenomena, primarily in electrical circuits; single, mesh, and coupled circuits; circuit response to varying voltage; general rules and theorems on circuits; equivalent systems; practical applications.
222. Operational Circuit Analysis. (2) II. Mr. Abbott
 Prerequisite: course 221 or graduate standing in engineering and consent of the instructor.
 Application of operational methods of circuit analysis, in particular the LaPlace Transformation, to systems having lumped or distributed constants.
223. Network Analysis. (2) I. Mr. Abbott
 Prerequisite: course 123B or 127, and graduate standing.
 Analysis of linear circuits, both bilateral and unilateral; applications of matrix algebra to unilateral circuits, feedback amplifiers; Routh's and Nyquist's criteria for stability.
- 226A-226B. Advanced Industrial Electronics. (3-3) Yr. Mr. Bruns, Mr. Smith
 Prerequisite: graduate standing in electrical engineering; course 126 recommended.
 Electronic instrumentation and control, heating, metallurgical testing, medical applications, geophysical apparatus, electrolytic processes and calculators.
298. Group Studies, Seminars, or Group Research. (1-5) I and II. The Staff (Mr. McFarland in charge)
 Prerequisite: graduate standing.
 Advanced group study in various fields of electrical engineering. Topics vary from year to year. In the past, seminars have been arranged on non-linear conductors; power-system short circuits and stability; electromagnetic radiation; network analysis; theory of high-frequency tubes; and other subjects.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester. The Staff (Mr. McFarland in charge)
 Prerequisite: graduate standing.
 Investigation of advanced electrical engineering problems.

PROFESSIONAL COURSE

400. The Electron Microscope. (1) I and II. Mr. Mackay
 Prerequisite: upper division standing in engineering or in any science.
 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.

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.
 Dynamics of a particle and of rigid bodies with emphasis on engineering problems. Includes kinematics and force, energy, and momentum methods of solution. Introduction to mechanical vibrations.
- 102C. Advanced Mechanics. (3) II. Mr. Meriam
 Prerequisite: course 102B. Mathematics 110A-110B 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 and II. 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, Mr. Nelson
 Prerequisite: course 102B and Mathematics 110A-110B.
 Analysis of motions and forces in mechanisms. Introduction to the theory of mechanical vibrations with applications to dynamic balancing, critical speeds, governed systems, and vibration isolation.
171. Design of Mechanical Equipment. (3) I and II. Mr. Frisch
 Two lectures and one three-hour laboratory per week.
 Prerequisite: course 106 and senior standing in engineering.
 Application of engineering principles to the design of complete machines. Analysis of curved beams, centrifugal stresses, governors, etc. Balance between theoretical and experimental methods. Economic aspects in material selection and processing.

172. Stress Analysis of Machine Parts. (3) II.

The Staff (Mr. Soroka in charge)

Two lectures and one three-hour laboratory 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, photoelastic and other methods.

173. Acoustics of Machinery. (3) II.

The Staff (Mr. Soroka in charge)

Prerequisite: course 102B and Mathematics 110A-110B. Recommended: course 170.

Mechanical-electrical-acoustical analogies, propagation and transmission of sound through various media and acoustic networks; measurement and analysis of noise; filtration and reduction of noise, response of the ear; architectural acoustics; ultra-sonics. Applications to the design of industrial 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, or design of mechanical equipment.

199. Individual Study or Research for Advanced Undergraduates. (1-5)

I and II.

The Staff (Mr. Garland in charge)

Prerequisite: senior standing in engineering, plus particular courses and scholarship requirements to be specified in each instance by the instructor.

Individual study or research on a special problem in graphics, dynamics, elasticity, or design of mechanical equipment. Enrollment is subject to consent of an instructor and to the availability of laboratory facilities.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

280. Application of Analogs to Engineering Problems. (3) II. Mr. Soroka

Prerequisite: graduate standing in engineering, physics, or mathematics.

Simulation of physical systems by analogs. Methods of solving linear and nonlinear differential equations experimentally. Membranes, conducting sheets, electrical networks, electronic analog computers, differential analyzer 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. Force-equilibrium, Lagrange and energy methods for complex systems. Successive approximation methods. Equivalent systems.

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 coördinates, three-dimensional problems, flat plates, and other selected topics.
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.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester. The Staff (Mr. Garland in charge)
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.
Mr. Iversen (in charge), Mr. Einstein, Mr. J. W. Johnson, Mr. Laird
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 and 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. The Staff (Mr. Tichvinsky in charge)
Prerequisite: course 105A.
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. Laitone in charge)
Prerequisite: courses 105A, 105B (may be taken concurrently). For chemical engineering students, Chemical Engineering 144 and 146A, one of which may be taken concurrently.
For industrial, electrical, and chemical engineering students.
Experimental work accompanied by calculations and reports on fluid flow, heat transfer, mechanics, combustion, internal combustion and other heat engines and power plants.
115. Reversed Thermodynamic Cycles and Refrigeration. (3) II.
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) I. Mr. Schultz
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. Thomsen
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. Dunkle
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. Laitone
Prerequisite: course 103. Recommended: course 161 or 162.
Wing characteristics, performance determination, loading conditions, static and dynamic stability and control of airplanes.
- 123A-123B. Internal Combustion Engines. (3-3) Yr.
Mr. Vogt (in charge), Mr. Tichvinsky
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.
Summary of fundamentals of mechanical engineering; analysis of typical engineering problems.
126. Applied Naval Architecture. (3) II. Mr. Schade, Mr. Gross
Lecture and laboratory.
Prerequisite: course 128A.
Preparation of lines and curves of form for a ship of definite requirements, including dimensions, coefficients, displacement and stability under various conditions of loading, power, and propeller requirements. Strength computations and review of classification requirements.
- 128A. Theoretical Naval Architecture. (3) I.
Mr. Schade (in charge), Mr. Gross
Prerequisite: course 103, Civil Engineering 108A, Engineering Design 102B.
The fundamentals of naval architecture, including form, stability, strength, resistance, power requirements, steering and subdivision. Emphasis on the fundamentals of design which are applicable to all of the larger types of power vessels.

- 128B. Marine Engineering (Machinery). (3) II. Mr. Tichvinsky
Prerequisite: course 105B, Engineering Design 102B. Recommended:
course 128A.
The power requirements and the selection of power plants for various
types of vessels and the necessary auxiliaries for steam and motor ships
will be considered.
- 131A-131B. Mechanical Engineering Laboratories. (4-4) Yr.
The Staff (Mr. Seban in charge)
Prerequisite: courses 103, 105B, Electrical Engineering 104B.
Engineering applications of the properties of substances, fluid mechan-
ics, heat transfer, and dynamics.
- 132A-132B. Process Engineering Laboratory. (4-4) Yr.
Mr. Grossman, Mr. Stewart
Prerequisite: courses 103, 152A, 152B (may be taken concurrently).
Application of the basic engineering principles utilized in the separa-
tion, contacting, disintegration and conversion processes.
143. Time and Motion Study. (3) I and II.
Mr. L. E. Davis (in charge), Mr. Keachie, Mr. Malcolm
Prerequisite: Engineering 41, 42, or 100; Business Administration 190
(may be taken concurrently).
Laws of motion economy; study of hand motions and their simplifica-
tion through the use of process charts, micromotion analysis, and workplace
design; equipment layout; theory and practice of time study and rating of
worker performance.
145. Tool Engineering. (3) I and II.
Mr. Galuzevski (in charge), Mr. Frisch
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 sub-
ject 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 for automatic ma-
chines.
146. Wage Incentives and Job Evaluation. (2) I and II. Mr. Malcolm
Prerequisite: course 143, Business Administration 190.
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 govern-
mental regulations on wages and salaries.
147. Industrial Engineering. (3) I and II. Mr. Keachie
Prerequisite: courses 145, 146; Engineering 120; Business Adminis-
tration 100. (Courses 145, 146, and Engineering 120 may be taken con-
currently with consent of the instructor.)
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 in charge, Mr. Grossman
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.

- 152A. Industrial Mass Transfer. (3) I. Mr. Snyder, Mr. Stewart
Prerequisite: courses 103 and 105A.
Principles of distillation, mechanical separations, filtration, crystallization, and materials handling.
- 152B. Industrial Mass Transfer. (3) II. Mr. Stewart
Prerequisite: courses 103, 105A and 151. Course 152A is not prerequisite to 152B.
Thermodynamics, heat and mass transfer principles applied to process equipment involving evaporation, evaporative cooling, humidification, absorption and extraction, drying and absorption.
154. Thermodynamics. (3) I and II. Mr. Grossman, Mr. Dunkle
Prerequisite: course 105A. Recommended: Mathematics 110A-110B.
Thermodynamic principles applied to process engineering. General conditions of equilibrium, reaction equilibria and the theory of solutions. The phase rule and phase equilibria of binary and multicomponent systems with application to mass transfer between phases. Thermodynamics of surface phenomena.
161. Applied Fluid Mechanics. (3) I and II. Mr. Iversen, Mr. Ipsen
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, Mr. Putnam
Prerequisite: course 103 and Mathematics 110A-110B.
Stream function, potential function, and conformal transformation with applications to engineering problems. Theory and application of viscous and compressible flows.
163. Flow Problems of the Process Industries. (3) II. Mr. Farfar
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. (2) I. Mr. Folsom (in charge), Mr. Schultz
Prerequisite: courses 103, 105B, Engineering Design 102B. Recommended: Mathematics 110A-110B.
Descriptive and analytical study of instruments and fundamental mechanical control systems.
180. Selection of Process Equipment and Materials of Fabrication. (3) II. Mr. Cornet
Prerequisite: Civil Engineering 108A; Engineering 40 or Metallurgy 150A; Chemistry 146A, or both courses 103 and 105B.
The principles underlying the selection of optimum mechanical design factors for the various functional types of chemical and petroleum process equipment; the principles of selection of optimum materials of fabrication for such equipment, considering process operating conditions, reactant corrosiveness, etc.

198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Folsom in charge)
Enrollment limited to seniors who will complete requirements for the B.S. degree within one year, and who have a scholarship average of B.
Group study of selected topics. Study groups may be organized in appropriate fields such as engineering statistics, industrial management, instrumentation, refrigeration, air conditioning, nuclear engineering, jet propulsion, rockets, and special design problems. Students may enroll in one or more separate subjects.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Schaaf in charge)
Enrollment limited to seniors who will complete requirements for the B.S. degree within one year, and who have a scholarship average of B.
Individual study and/or research on a problem normally chosen from a restricted list.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

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, Mr. Ipsen
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 Time and Motion Study. (3) I. Mr. L. E. Davis
Prerequisite: courses 143, 146, Mathematics 130E (Mathematics 110A-110B not required).
A continuation on an advanced level of the subject matter presented in course 143; complex problems of production measurement and methods development; introduction to research techniques in development of fundamental data.
265. Heat Conduction. (2) I. Mr. Giedt
Prerequisite: courses 151 and 230 (may be taken concurrently).
Study of the 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. Heat Transfer: Thermal Radiation. (2) I. Mr. Dunkle
Prerequisite: course 151 (may be taken concurrently).
Transfer of thermal radiant energy, including geometrical and spectral characteristics of radiant systems, and gaseous radiation.
268. Advanced Problems in Thermodynamics. (3) II. Mr. Grossman
Prerequisite: course 154.
The study of nonideal systems including problems in capillary thermodynamics, diffusional processes, catalytic reactions and combustion. An introduction to the Third Law, statistical mechanics, statistical thermodynamics, and the quantum mechanical treatment of rate processes.

271. Theory of Pumping Machinery. (3) II. Mr. Folsom
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. Schaaf
Prerequisite: course 230. Recommended: courses 161 and 162.
Theory of viscous and turbulent flow with applications to fundamental flow problems.
277. Compressible Fluids. (3) I. Mr. Laitone
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. Folsom in charge)
Seminars may be organized in appropriate fields such as aerodynamics, rarefied gas dynamics, combustion, metal cutting, air conditioning, dynamics, pressure vessel design, thermodynamics, heat transfer, Diesel engines, gas turbines, automatic control, nuclear engineering, and lubrication. Students may enroll in one or more separate subjects.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.
The Staff (Mr. Schaaf in charge)
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. Mr. Pask
Prerequisite: Chemistry 1A-1B, Physics 4A, 4B, 4C.
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.
Prerequisite: course 161 or consent of the instructor. Mr. Pask
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. Mr. Pask
Prerequisite: senior standing in engineering, chemistry, geology, or
physics.
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 139)

271. Refractories. (2) I. Mr. Pask
Prerequisite: course 161 or consent of the instructor.
Types of refractories. Raw materials and technical problems of manu-
facture. 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. Mr. Pask
Prerequisite: graduate standing and consent of the instructor.
Principles of crystal chemistry and their application to ceramics. Forma-
tion, structure and physical properties of glasses. Advanced studies of
high temperature reactions. Physical, thermal, and electrical properties of
materials. Theory and practice at ceramic-to-metal bonding.
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each
semester. Mr. Pask
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

- 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.
- †118. Extractive Metallurgy Laboratory. (2) II. Mr. Ravitz
Prerequisite: course 100B or consent of the 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.
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.

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

* Not to be given, 1951-1952.

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. _____
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.
Prerequisite: course 150A or Engineering 40 and course 152.
Generation of X rays and the application of X-ray diffraction to the study of metals and alloys; phase diagram determination, particle size, internal stresses, cold work, recrystallization, preferred orientation; crystal structure determinations and phase identification.
- 170A. Properties of Metals. (3) I. Mr. Dorn
Prerequisite: Civil Engineering 108A and either course 150A or Engineering 40.
Engineering properties of metals and their function in design, selection and specification; analysis of the static, impact, endurance, and creep resistance of metals under combined stresses; discussions of nature of wear resistance and corrosion resistance of metals.
- 170B. Properties and Forming of Metals. (3) II. Mr. Dorn
Prerequisite: course 170A.
A study of the application of the principles of elasticity, plasticity, and the properties of metals to the solution of problems in machining and plastic forming of metals.
172. Inspection of Metals. (2) I. Mr. Parker
Prerequisite: course 150A or Engineering 40.
Lectures and laboratory instruction on the industrial techniques for inspection of metals; the principles and application of visual inspection, macrography, magnetic, and fluoroscopic methods of testing; the theory of X-ray radiography and its application to metal inspection.
- †174. Metallic Reaction Rates. (3) II. Mr. Dorn
Prerequisite: course 150A (or Engineering 40 and course 152) and Chemistry 110A–110B. 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.
- †176. Metallurgy of Welding. (3) II. Mr. Parker
Two lectures and one three-hour laboratory period.
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.

* Not to be given, 1951–1952.

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

198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Hultgren in charge)

Prerequisite: senior standing in engineering.
Group study of selected topics.

199. Individual Studies or Research for Advanced Undergraduates. (1-5)
I and II. The Staff (Mr. Hultgren in charge)

Prerequisite: senior standing in engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- †202. Metallurgy of the Less Common Metals. (2) II. Mr. Ravitz

- †210A-210B. Metallurgical Investigation. (2-3; 2-3) 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. Parker
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)

- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.
The Staff (Mr. Hultgren in charge)

- Research Conference in Physical Metallurgy. (No credit) I and II.
The instructing staff and graduate students meet once a week to discuss research and advanced subjects.

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

Mining

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. Survey of the Mineral Industry. (3) II. _____
 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. Mineral Exploitation. (3) I. _____
 Prerequisite: Geology 1, Mathematics 4A, Mineralogy 6, course 101.
 Methods of mining mineral deposits; factors affecting choice of a mining method. Description, with emphasis on principles involved, of the various mining methods. Mine design: practice in the laying out of extraction openings and the design of stopes for the purpose of mining ore bodies.
- 105A. Mining Machinery and Equipment. (3) I. Mr. York
 Two lectures and one three-hour laboratory period per week.
 Prerequisite: Engineering 35, Electrical Engineering 101, Mechanical Engineering 103; Mechanical Engineering 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. Mr. York
 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 gases in the mine atmosphere.
- 107A. Economics of Mineral Industry. (2) I. Mr. Wisser
 Prerequisite: course 101, Geology 106 and 108.
 Mining as a business. Organization of companies; financing. Federal and state regulation. Principles of investment and risk; efficiency, cost (including taxation). Redemption of capital. Marketing of products. Trends of demand, production, consumption, prices.
- 107B. Valuation of Mines. (3) II. Mr. Wisser
 Prerequisite: courses 101, 111A, and 107A.
 Valuation of prospects and developed mines. In the case of the latter: measurement of ore supply; estimations of probable costs and profits, present value of profit in sight. Geological and economic factors in mine valuation.
109. Administrative and Operating Records and Reports. (2) II. Mr. York
 Prerequisite: course 103 (to be taken concurrently).
 Mine accounting and cost keeping, labor records, purchase and distribution of supplies, production records, depreciation, preparation and use of cost data, administrative reports.
- 111A-111B. Mineral Exploration—Metalliferous. (3-3) Yr. Mr. Wisser
 Prerequisite: course 101, Geology 102A-102B, 103, and 106, Engineering 35.
 Methods of exploring for commercial mineral deposits: geologic map-

ping, sampling, exploratory drilling, geophysical methods. Assembly and analysis of data secured. Structural analysis of mineralized districts from the standpoint of the mechanics of rock deformation; application to the search for valuable minerals.

113. Mine Rescue and First Aid. (1) II. Evening classes (for opening dates see official bulletin board).

Mr. York and the U. S. Bureau of Mines Safety Station Staff

Open only to upper division students in the mining, petroleum engineering, metallurgy, and mineral exploration programs of study.

151. Mine Surveying. (3) I. Mr. York

(Formerly numbered 1.)

Prerequisite: Engineering 1A-1B.

Surface and underground mine surveys. Preparation of mine maps.

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

The Staff (Mr. York in charge)

Prerequisite: senior standing in engineering.

Group study of selected topics.

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

The Staff (Mr. York in charge)

Prerequisite: senior standing in engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

201. Investigations in Mining Practice. (2-3) I and II. Mr. York

Prerequisite: courses 103, 105A-105B.

298. Group Studies, Seminars, or Group Research. (1-5) I and II.

Prerequisite: graduate status.

The Staff (Mr. York in charge)

- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.

The Staff (Mr. York in charge)

Prerequisite: graduate status.

Petroleum Engineering

UPPER DIVISION COURSES

The 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.

117. The Petroleum Industry. (2) I.

Mr. Uren

Prerequisite: junior standing in engineering; open also to juniors in the College of Letters and Science whose major is geology or chemistry.

A general introductory review of the technology and economics of the several divisions of the petroleum industry.

119. Petroleum Products Testing. (2) II.

Mr. Carlson

Prerequisite: course 117.

Laboratory determinations and studies of physical and chemical properties of petroleum and its products that are of importance in technical studies and specifications.

- 121A. Oil Field Development. (3) I.

Mr. Uren

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. Mr. Uren
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. Somerton
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.
125. Petroleum Production Economics. (3) II. Mr. Uren
Prerequisite: courses 117 and 121A.
Economic structure of the industry; geographic distribution; land acquisition and control; industrial organization; oil industry finance; taxation; labor management; materials and equipment employed; cost-accounting; appraisal of properties; conservation of oil and gas resources; economic aspects of petroleum engineering problems.
127. Oil Field Mapping Practice. (2) I. Mr. Carlson
Lecture and laboratory.
Prerequisite: Engineering 1A-1B, 22 and 23, course 121A (may be taken concurrently).
Preparation of field and property maps and well logs; development of geologic sections and structure—contour maps and models from well log data.
129. 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. Somerton 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. Somerton in charge)
Prerequisite: senior standing in engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- 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. (2-3) 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. (2-3) II. Mr. Carlson
Prerequisite: course 209A or consent of the instructor.
Evaluation of crude oils, raw stocks, and finished products. Study of factors which determine plan of processing in a petroleum refinery.
213. Valuation of Oil- and Gas-Producing Properties. (2) II. Mr. Uren
Prerequisite: course 121A-121B.
A study of the physical and economic factors underlying the appraisal of oil-producing properties. Estimation and evaluation of oil and gas reserves.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
Prerequisite: graduate standing. The Staff (Mr. Putnam in charge)
- 299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.
The Staff (Mr. Putnam in charge)
Prerequisite: graduate standing.

TRANSPORTATION 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, 108G, 108H, 113, 171, 175 for other upper division courses relating to transportation.

190. Traffic Engineering for Police. (2) II. Mr. Kennedy
Prerequisite: upper division standing and one course in statistics or consent of the 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.

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

198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. H. E. Davis in charge)
Prerequisite: senior standing in engineering.
Group study of selected topics in transportation engineering.
199. Individual Study or Research for Advanced Undergraduates. (1-5)
I and II. The Staff (Mr. H. E. Davis in charge)
Prerequisite: senior standing in engineering.
Individual study or research of approved projects in transportation engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

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. Kennedy
Prerequisite: course 210 (may be taken concurrently).
Field and laboratory practice in making traffic engineering investigations and analysis of data. Vehicle performance.
211. Traffic Engineering: Operations. (3) II. Mr. D. S. Berry
Prerequisite: graduate standing in engineering, except when special provision is made for students in certain programs of study.
Theory and practical application of street and highway traffic engineering restrictions and uniform traffic control devices. Traffic engineering administration.
220. Highway and Airport 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.
The selection of site, and the planning, design, and construction of airports.

298. Group Studies, Seminars, or Group Research. (1-5) I and II.

The Staff (Mr. H. E. Davis in charge)

Prerequisite: graduate standing.

Seminars or integrated group studies in selected advanced subjects in transportation engineering.

299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester.

The Staff (Mr. H. E. Davis in charge)

Prerequisite: graduate standing.

Research or investigation in selected advanced subjects in transportation engineering.

ENGLISHMyron F. Brightfield, Ph.D., *Professor of English.*Arthur G. Brodeur, Ph.D., *Professor of English and Germanic Philology.*¹ Bertrand H. Bronson, Ph.D., *Professor of English.*James R. Caldwell, Ph.D., *Professor of English.*James M. Cline, Ph.D., *Professor of English.*Willard H. Durham, Ph.D., *Professor of English.*Willard E. Farnham, Ph.D., *Professor of English.*James D. Hart, Ph.D., *Professor of English.*Benjamin H. Lehman, Ph.D., *Professor of English.*Guy Montgomery, Ph.D., LL.D., *Professor of English.*George R. Potter, Ph.D., *Professor of English (Chairman of the Department).*¹ Mark Schorer, Ph.D., *Professor of English.*² George R. Stewart, Ph.D., *Professor of English.*Walter M. Hart, Ph.D., LL.D., *Professor of English, Emeritus.*G. Dundas Craig, M.A., Litt.D., *Assistant Professor of English, Emeritus.*Arthur E. Hutson, Ph.D., *Associate Professor of English.*Gordon McKenzie, Ph.D., *Associate Professor of English.*Josephine Miles, Ph.D., *Associate Professor of English.*Lynn B. Bennion, Ph.D., *Assistant Professor of English.*Travis M. Bogard, Ph.D., *Assistant Professor of English.*Everett Carter, Ph.D., *Assistant Professor of English.*R. Bertrand Evans, Ph.D., *Assistant Professor of English and Education.*² Sears R. Jayne, Ph.D., *Assistant Professor of English.*John E. Jordan, Ph.D., *Assistant Professor of English.*† Harold D. Kelling, Ph.D., *Assistant Professor of English.*James J. Lynch, Ph.D., *Assistant Professor of English.** Thomas F. Parkinson, Ph.D., *Assistant Professor of English.*† John H. Raleigh, Ph.D., *Assistant Professor of English.*† David W. Reed, Ph.D., *Assistant Professor of English.*Wayne Shumaker, Ph.D., *Assistant Professor of English.** Ernest Tuveson, Ph.D., *Assistant Professor of English.*Roland C. Ball, Jr., M.A., *Lecturer in English.*Harold R. Brumbaum, M.A., *Lecturer in English.*¹ In residence fall semester only, 1951-1952.² In residence spring semester only, 1951-1952.

† Sabbatical leave in residence fall semester, 1951-1952.

* Absent on leave, 1951-1952.

John H. Edwards, M.A., *Lecturer in English.*
 Johann S. Hannesson, M.A., *Lecturer in English.*
 Benjamin B. Hoover, M.A., *Lecturer in English.*
 Milton Miller, M.A., *Lecturer in English.*
 Harbison Parker, M.A., *Lecturer in English.*
 Imogene B. Walker, Ph.D., *Lecturer in English.*
 Anita Whistler, M.A., *Lecturer in English.*

Students must have passed Subject A before taking any course in English.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Advisers: Mr. Jordan, Chairman; Mr. Bogard, Mr. Carter, Mr. Lynch (fall semester), Mr. Jayne (spring semester), 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.

(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 313.

Teacher Training.—Consult Mr. R. B. Evans; see also the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Higher Degrees.—Consult Mr. M. Schorer (fall semester), Mr. W. E. Farnham (spring semester); see also the ANNOUNCEMENT OF THE GRADUATE DIVISION and the Graduate Division's 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. Ball, Mr. Bennion, Mr. Bogard, Mr. Brumbaum, Mr. Carter, Mr. Edwards, Mr. Farnham, Mr. Hannesson, Mr. Hoover, Mr. Jayne, Mr. Jordan, Mr. Lehman, Miss Miles, Mr. Miller, Mr. Montgomery, Mr. Parker, Mr. Potter, Mr. Raleigh, Mr. Reed, Mr. Shumaker, Mrs. Walker, Miss Whistler

Prerequisite: a passing grade in Subject A (examination or course).

1A. Training in writing and reading.

1B. An introduction to the study of literature, with further training in writing.

Prerequisite for the English major. Course 1A is prerequisite to 1B.

SOPHOMORE COURSES

25. Language. (3) II.

Mr. Reed

The origins and symbols of human speech; patterns, change, and growth in language; the interrelations of language, thought, and civilization. Emphasis on English, as written and spoken in England and in America. Designed for sophomores, but open to students in the upper division.

30. Introduction to American Literature. (3) II.

Mr. Stewart

41. Writing in Connection with the Reading of Important Books of the Nineteenth and Twentieth Centuries. (3) I.

Mr. Evans

Prerequisite: course 1A-1B or Speech 1A-1B, or consent of the instructor.

44A-44B. Masterpieces of Literature. (3-3) Yr.

Mr. Jayne, Mr. Lehman

44A: Mr. Lehman; 44B: Mr. Jayne.

Lectures on great works of the world's literature.

Course 44A is not prerequisite to 44B.

46A-46B. Survey of English Literature. (3-3) Yr.

Mr. Bennion, Mr. Bogard, Mr. Hannesson, Mr. Jordan, Mr. Kelling,

Mr. Lynch, Mr. Miller, Mr. Raleigh, Mr. Shumaker, Mrs. Walker

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) I.

Mr. Cline

UPPER DIVISION COURSES

Group I—Unrestricted Courses

(Open to all students in the upper division; enrollment not limited, except as noted)

110. The English Language. (3) I and II.

Mr. Hutson, Mr. Reed

I: Mr. Hutson; II: Mr. Reed.

- 114A-114B. The English Drama. (3-3) Yr. Mr. Durham
 114A. From the miracle plays to 1642.
 114B. From 1642 to the present.
 Course 114A is not prerequisite to 114B.
116. The English Bible as Literature. (3) II. Mr. Lehman
- 117A-117B. Shakespeare. (3-3) Yr. Mr. Montgomery, Mr. Farnham
 117A: Mr. Montgomery; 117B: Mr. Farnham.
 Lectures on the entire works of Shakespeare, including nondramatic poems. Open to both majors and nonmajors. Course 117A is not prerequisite to 117B.
- 117E. Shakespeare. (3) I and II. Mr. Durham, Mr. Montgomery
 I: Mr. Durham; II: Mr. Montgomery.
 Lectures on fifteen plays of Shakespeare. May not be taken by students whose major is English.
119. The Age of Johnson. (3) II. Mr. Lynch
121. The Romantic Period. (3) II. Mr. Jordan
122. The Victorian Period. (3) I. Mr. McKenzie
123. Nineteenth-Century British Prose. (3) I. Mr. Shumaker
- 125C-125D. The English Novel. (3-3) Yr. Mr. Brightfield, Mr. Raleigh
 125C: Mr. Brightfield; 125D: Mr. Raleigh.
 Course 125C is not prerequisite to 125D.
128. Regional Literature: California and the West. (3) I. Mr. Hart
- 130A. American Literature Before 1840. (2) II. Mr. Hart
- 130B. American Literature: 1840-1885. (3) I. Mr. Carter
- 130C. American Literature: 1885 to the Present. (3) II. Mr. Hart
- *131. American English. (3) I. Mr. Reed
 General description of the English language in America. Comparisons with British English. American regional dialects.
141. Modes of Writing (Exposition, Fiction, Verse, etc.). (3) II. Mr. Stewart
 Prerequisite: course 1A-1B or Speech 1A-1B, or consent of the instructor. Open to qualified sophomores with consent of the instructor.
 Writing in connection with readings in recent English literature and its continental backgrounds.
149. The English Lyric. (3) II. _____
 The development of the English traditions of structure and style in lyric poetry.
152. Chaucer. (3) I. Mr. Brodeur
- *153A-153B. Introduction to the Study of Poetry. (3-3) Yr. _____
- *155. The Age of Chaucer. (3) II. _____
- 158A-158B. The English Renaissance. (3-3) Yr. Mr. Cline, Mr. Potter
 158A: Mr. Cline; 158B: Mr. Potter.
 This course replaces the former English 156 (The Age of Elizabeth) and 157 (The Age of Milton).

* Not to be given, 1951-1952.

158A: Beginnings of the English Renaissance, and literature of the sixteenth century.

158B: Literature of the seventeenth century.

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
 166. The Age of Swift and Pope. (3) II. Mr. Kelling

Group II—Restricted Courses

A. THE JUNIOR COURSE

(Sections limited to twenty students each)

Designed primarily for juniors whose major subject is English.

100. Methods and Materials of Literary Criticism. (3) I and II.

Mr. Bennion, Mr. Bogard, Mr. Carter, Mr. Lehman, Mr.

McKenzie, Miss Miles, Mr. Miller, Mrs. Walker

Explication and evaluation of literary texts and study of the various principles of literary judgment.

B. THE SENIOR COURSE

(Sections limited to twenty students each)

Designed primarily for seniors whose major subject is English; English 151K is prescribed for English majors working under Plan II.

Prerequisite: course 100.

151D. Dryden. (3) I. Mr. Montgomery

*151E. Henry James. (3) I. Mr. Raleigh

151J. Donne and Milton. (3) I and II.

Mr. Farnham, Mr. Potter, Mr. Shumaker

I: Mr. Farnham, Mr. Potter; II: Mr. Shumaker.

151K. Contemporary Authors. (3) I and II. Miss Miles, Mr. Raleigh

I: Yeats, Miss Miles; II: Joyce, Mr. Raleigh.

151L. Chaucer. (3) I and II.

Mr. Bronson, Mr. Caldwell, Mr. Cline, Mr. Hutson

I: Mr. Bronson, Mr. Hutson; II: Mr. Caldwell, Mr. Cline, Mr. Hutson.

151S. Shakespeare. (3) I and II. Mr. Bennion, Mr. Evans

I: Mr. Evans; II: Mr. Bennion.

151Sp. Spenser. (3) II. Mr. Jayne

*151Sw. Swift. (3) II. Mr. Kelling

151Wd. Wordsworth. (3) I. Mr. Jordan

198A-198B. Senior Preceptorial Course. (3-3) Yr.

Mr. Montgomery (in charge), Mr. Jordan, Mr. Kelling

198A: Mr. Jordan, Mr. Montgomery; 198B: Mr. Kelling, Mr. Montgomery.

Reading in chosen fields, with critical writing.

Primarily for English majors in Plan II.

* Not to be given, 1951-1952.

Course 198A is not prerequisite to 198B, but a student must have received 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. Jordan in charge)

Reading and conference for individual honor students.

Any student who completes 9 or more units of upper division English in the junior year with an average grade of not less than B may apply for admission to English 199. Such honor students undertake, in a chosen field, a program of reading and of conferences with the instructor. The number of units of credit is determined by the instructor.

D. ADVANCED COMPOSITION

(Open only to upper division students who have the consent of the instructor)

106A. Fiction. (3) I.

Mr. Schorer

106B. Verse. (3) I and II.

Mr. Caldwell, Miss Miles

I: Mr. Caldwell; II: Miss Miles.

*106D. Literary Criticism. (3) II.

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) I and II.

Mr. Montgomery, Mr. Tuveson

106L. Advanced Composition. (3) I and II.

Mr. Evans, Mr. Lynch

I: Mr. Evans; II: Mr. Lynch.

Primarily for candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is English.

106M. Advanced Composition. (3) I and II.

Mr. Bennion, Mr. Evans

I: Mr. Bennion; II: Mr. Evans.

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. Bogard (chairman), Mr. Brodeur, Mr. Bronson (fall semester);

Mr. Hutson, Miss Miles, Mr. Stewart (spring semester)

* Not to be given, 1951-1952.

TEACHERS' COURSE

300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I and II. Mr. Evans, Mr. Lynch

I: Mr. Lynch; 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 18-unit requirement in education for the secondary credential.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

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: 210, 217, 218, 220B, 225A-225B, 230A-230B, 247, 251A-251B, 254A-254B, 257A, 257B, 258, 259, 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, 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. Lynch

I: Mr. Brightfield, Mr. Lynch; II: Mr. Brightfield.

Description and analysis of the techniques of literary research and criticism. Outlines of the progress of scholarship in the linguistic, historical, and critical study of English literature. Review and systematic arrangement of the aids to bibliographical research.

202. The History of English Criticism. (3) I.

Mr. Brightfield

- †204. Celtic Studies. (3) II.

Mr. Hutson

This course may be repeated for credit.

208. Problems in the Study of Literature. (3) I and II.

(Formerly numbered 206.) Mr. Lehman, Mr. McKenzie, Miss Miles

Textual analysis, discussion of scholarly approaches, based on secondary reading; problems in the presentation of materials.

I: Tragedy, Mr. Lehman; II: Later Nineteenth Century, Mr. McKenzie; Seventeenth Century, Miss Miles.

210. Chaucer. (3) II.

Mr. Cline

Some knowledge of Chaucer and his language is presupposed.

- 211A. Old English Literature. (3) I.

Mr. Brodeur, Mr. Reed

Open to seniors with consent of the instructor.

Rapid reading of Old English texts.

- 211B. The Beowulf. (3) II.

Mr. Brodeur

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

- 211G-211H. Old and Middle English. (3-3) Yr. Mr. Brodeur
Prerequisite: a reading knowledge of German.
Development of the English language from its beginning as illustrated in representative texts. Especially designed for candidates for the Ph.D. degree.
213. Readings in Middle English. (3) I and II. Mr. Hutson
Rapid reading of selections in Middle English, and perhaps some entire poems, from the twelfth century to the fifteenth.
217. Studies in Shakespeare. (3) II. Mr. Durham
- *218. Milton. (3) II. Mr. Potter
- *220A-220B. The Medieval Mind. (3-3) Yr. Mr. Jayne
220A. Readings in Medieval Latin.
220B. Dominant Themes in Medieval Life.
An introduction to the central language and literature of the Middle Ages, presupposing at least such a knowledge of Latin as may be gained in high school. Attention is called to the course Romance Philology 201, Late Latin Language and Literature.
- *225A-225B. The Popular Ballad. (3-3) Yr. Mr. Bronson
- 230A-230B. American Literature. (3-3) Yr. Mr. Carter, Mr. Hart
230A: Mr. Hart; 230B: Mr. Carter.
247. Theory of Poetry. (3) I. 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
- 257A. Literary Criticism, 1750-1850. (3) I. Mr. McKenzie
(Formerly numbered 257.)
- 257B. Methods and Assumptions of Recent Literary Critics. (3) II. Mr. Shumaker
258. Johnson and His Contemporaries. (3) I. Mr. Bronson
259. Theory of the Arts in the Seventeenth Century. (3) II. ———
262. Nineteenth-Century Literature. (3) II. Mr. Brightfield
264. John Donne and His Followers. (3) I. Mr. Potter
- *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, fall semester; Mr. Farnham in charge, spring semester)
(Formerly numbered 260.)
The members of the department are variously engaged in particular research and stand ready to advise and direct properly qualified graduate students in their several fields. Some indication of fields of interest is herewith suggested:
1. Critical Theory (Brightfield, Caldwell, McKenzie, Miles, Schorer).

2. Prose Fiction (Brightfield, Lehman, Raleigh, Schorer).
3. Drama (Bogard, Durham, 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).
10. Shakespeare, Donne, Sixteenth and Seventeenth Centuries (Cline, Farnham, Jayne, Miles, Potter).
11. Eighteenth Century (Bronson, Kelling, Lynch, Montgomery, Schorer, Tuveson).
12. Nineteenth Century (Bennion, Brightfield, Caldwell, Jordan, Lehman, McKenzie, Shumaker).
13. Twentieth Century (Durham, Hart, Lehman, Parkinson, Schorer, Stewart).
14. American Literature (Carter, Hart, Stewart).

FOREIGN LITERATURE IN TRANSLATION

The following courses offered in the departments of language and literature do not require a reading knowledge of any foreign language.

Classics 34. Epic Poetry: Homer and Vergil.

*178. Greek and Roman Mythology.

180A-180B. The Latin Classics in English.

Dramatic Art 157A-157B. Modern European Drama.

French 39A-39B-39C. French Literature in English Translation.

122A-122B. Readings in French Literature of the Middle Ages.

*123A-123B. Renaissance and Reformation in French Literature.

*124A-124B. Voltaire and the Enlightenment.

German 39A-39B-39C-39D. Great Writers in German Literature.

Italian *150A-150B. Dante's *Divine Comedy* in English Translation.

151A-151B. The Renaissance.

Oriental Languages 112A-112B. Survey of Chinese Literature and Literary Criticism.

132. History of Japanese Literature.

Scandinavian Languages 100A-100B. History of Scandinavian Literature.

*106. History of Scandinavian Drama.

107. The Plays of Ibsen.

*108. Strindberg and His Writings.

120A-120B. The Novel in Scandinavia.

125. Masterpieces of Old Norse Literature.

Slavic Languages 130. Introduction to Russian Literature.

*131. Russian Literature (1880-1917).

*132. Russian Literature Since 1917.

*133A-133B. Russian Novelists of the Nineteenth Century (except Tolstoy and Dostoyevsky).

*133C. Dostoyevski.

* Not to be given, 1951-1952.

- *133D. Tolstoy.
- 134. Russian Literature and Folklore.
- *135. The Russian Drama.
- *138. Modern Russia.
- *140. Survey of Slavic Literatures, excluding Russian.
- 152. Polish Romantic Poetry.
- 160. Survey of Czech and Slovak Literature.
- *170. Survey of South Slavic Literature.

Spanish 39A-39B-39C-39D. Spanish and Spanish-American Literature in English Translation.

FORESTRY

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*.

Emanuel Fritz, M.E., M.F., *Professor of Forestry*.

Joseph Kittredge, Jr., Ph.D., *Professor of Forestry*.

Myron E. Krueger, M.S., *Professor of Forestry*.

Walter Mulford, F.E., Sc.D., *Professor of Forestry, Emeritus*.

Arthur W. Sampson, Ph.D., *Professor of Forestry, Emeritus*.

Henry J. Vaux, Ph.D., *Associate Professor of Forestry*.

² R. Keith Arnold, Ph.D., *Assistant Professor of Forestry*.

♥ Robert N. Colwell, Ph.D., *Associate 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*.

² Herbert A. Jensen, B.S., *Lecturer in Forestry*.

Letters and Science List.—Courses 1, 103, and 125 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

LOWER DIVISION COURSES

- | | |
|--|---------------------|
| <p>1. Elements of Forestry. (3) I.
Not open to students with a major in forestry.
Forests in their relation to national life; the life history of the tree and the forest; general principles of forestry.</p> | <p>Mr. Cockrell</p> |
| <p>49. Field Practice Course. (No credit)
(Formerly numbered 49A-49B.)
Prerequisite: Engineering 1A-1B, Botany 1, and an average grade of C or higher.
Approximately eleven weeks' summer field practice course at Meadow Valley, in the Plumas National Forest.
Field laboratory work in forest surveys and mapping, forest mensuration, silviculture, logging, and milling operations.</p> | <p>Mr. Zivnuska</p> |

* Not to be given, 1951-1952.

² In residence spring semester only, 1951-1952.

♥ On military leave, 1951-1952.

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.
101. Introduction to Range Management. (3) II. _____
 Development of livestock and range industry in the United States, its place in forestry and agriculture. Breeds of stock and types of range required. Elements of range management.
102. Range Management Technique. (3) II. _____
 Lecture and laboratory.
 Prerequisite: Engineering 1A-1B; Chemistry 8; an elementary course in statistics; course 103 or Botany 151. The additional prerequisites of course 101 and Botany 108 may be taken concurrently.
 Field and laboratory procedure, designed especially for students who plan to take advanced work in range management. Special field trips will be arranged.
103. Principles of Forest Ecology. (3) I. _____
 Prerequisite: Botany 1, Chemistry 1A.
 Structure of the plant as modified by conditions of habitat; plant succession and societies.
104. Silviculture. (4) I. Mr. Baker
 Lecture and laboratory.
 Prerequisite: course 103.
 Methods of governing growth and reproduction of forests through the application of ecological laws.
- *106. Forest Planting. (3) II. _____
 Lecture, laboratory, and field trips.
 Prerequisite: Botany 1.
 Artificial establishment of forests from collection of seed to planting of trees; the physiological, environmental, and genetic factors affecting survival and growth of forest seedlings; financial aspects of forest plantations.
108. Dendrology. (4) I. _____
 Lecture, laboratory, and field trips.
 Prerequisite: Botany 1.
 Identification by morphological characters of important forest trees of North America; their ecological and geographical distribution; field identification of many forest shrubs.
110. Forest Mensuration. (4) II. Mr. Zivnuska
 Lecture and conference.
 Prerequisite: a course in elementary statistics; course 49 or consent of the instructor.
 Principles underlying log scaling and the estimation of timber volume and value; growth of stands; the application of statistical analysis to forest measurements.
112. Lumber Manufacturing. (3) I. Mr. Fritz
 Prerequisite: senior standing. Senior and graduate students from other departments may be admitted with consent of the instructor.
 Organization and characteristics of the lumber industry; the manufacture of lumber from log pond to finished product; seasoning, grading, marketing.

* Not to be given, 1951-1952.

114. Wood Technology. (3) II. Mr. Fritz
Lecture and laboratory.
Prerequisite: Chemistry 1A, Botany 1.
Junior and senior students from other departments may be admitted with consent of the instructor.
Anatomy of wood; properties and uses; identification of commercial species.
115. Physical Properties of Wood. (3) I. Mr. Cockrell
Lecture and laboratory.
Prerequisite: Physics 2A-2B, 3A-3B, and senior standing.
Density, moisture relations, shrinking and swelling, strength, thermal, electrical, and acoustic properties of wood.
118. Forest Engineering. (3) II. Mr. Krueger
Lecture and laboratory.
Prerequisite: Engineering 1A-1B, Physics 2A-2B.
Engineering methods involved in logging and forest management.
120. Management of Forest Properties. (4) II. Mr. Barr
Lecture and laboratory.
Prerequisite: courses 104 and 110.
Economic and technical principles involved in the management of forest lands for the continuous production of timber crops.
121. Forest Economics. (3) I. Mr. Vaux
Prerequisite: 6 units of economics and senior standing. Senior and graduate students from other departments may be admitted with consent of the instructor.
Economic problems and principles involved in the utilization of forest land and timber, and in the distribution of forest products.
122. Forest Policy. (3) I. Mr. Vaux
Prerequisite: 6 units of economics and senior standing.
The evolution of forest policy in the United States. State and national forest policies. Policy objectives, programs, and groups. Analysis of current policy problems.
123. Range Utilization. (3) I. Mr. Biswell
Lecture, laboratory, and field trips.
Prerequisite: courses 101 and 103; Botany 111 and senior standing.
Recommended: course 102.
Range use and forage valuations as integral parts of land use planning, including technical problems of range management.
125. Forest Influences. (3) I. Mr. Kittredge
Lecture and laboratory or field trips.
Prerequisite: course 103, Physics 2A-2B, senior standing. Recommended: Soil Science 100 and Geography 111.
The influence of forests and brush on soil moisture, run-off, stream flow, floods, erosion, local climate, and soil productivity for forest growth.
126. Production Methods in the Forest Industries. (3) II. Mr. Krueger
Prerequisite: 6 units of economics and senior standing.
Production methods and principles involved in logging; cost analyses.
128. Forest Protection. (3) II. Mr. Arnold
Junior and senior students from other departments may be admitted with consent of the instructor.

One field trip required.

Forest fire behavior; ignition and spread of forest fires and factors by which they are influenced; forest fire control organization and equipment; methods of fire prevention and suppression.

132. Forest Photogrammetry. (3) II.

Mr. Jensen

Lecture 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 the instructor.

Group study, or investigation, of special problems.

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

The Staff (Mr. Baker in charge)

Prerequisite: senior standing and consent of the instructor.

This course may also be taken during the summer at the Forestry Camp at Meadow Valley, Plumas County.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

201A-201B. Seminar in Forestry. (2-2) Yr. Mr. Kittredge, Mr. Krueger

201A: Mr. Kittredge; 201B: Mr. Krueger.

Course 201A is not prerequisite to 201B.

202A-202B. Research in Forestry. (1-6; 1-6) Yr.

The Staff (Mr. Baker in charge)

Course 202A is not prerequisite to 202B.

203A-203B. Seminar in Forest Influences and in Forest Ecology. (2-2) Yr.

203A: Mr. Kittredge; 203B: _____ Mr. Kittredge, _____

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. _____

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.

207A: Mr. Vaux; 207B: Mr. Zivnуска. Mr. Vaux, Mr. Zivnуска

Prerequisite: 12 units of economics, agricultural economics, or forest economics.

Course 207A is not prerequisite to 207B.

208. Seminar in Range Management. (2) I.

Mr. Biswell

Prerequisite: course 123.

FRENCH

*Gabriel Bonno, Docteur ès Lettres, *Professor of French.*

² Clarence D. Brenner, Ph.D., *Professor of French.*

Francis J. Carmody, Ph.D., *Professor of French.*

Jacqueline de La Harpe, Docteur ès Lettres (Lausanne), *Professor of French.*

Percival B. Fay, Ph.D., *Professor of French.*

Arnold H. Rowbotham, Ph.D., *Professor of French (Chairman of the Department).*

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.*

Edward F. Meylan, Ph.D., *Associate Professor of French.*

Alvin A. Eustis, Jr., Ph.D., *Assistant Professor of French.*

Irving Putter, Ph.D., *Assistant Professor of French.*

Warren Ramsey, Ph.D., *Assistant Professor of French.*

J. Robert Loy, Ph.D., *Instructor in French.*

Marie-Louise Dufrenoy, Ph.D., *Associate in French.*

Alice Habis-Reutinger, Ed.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 69.

Departmental Major Adviser: 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, and 124A-124B; 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 1, 2, 3, 4, three hours of basic study will be supplemented by two hours of specialized practical work, devoted to reading in some sections, and to conversation in other sections. The work in course 12 will be divided similarly.

1. Elementary French. Beginners' Course. (4) I and II. Mr. Loy in charge
Sections meet five hours per week.

* Absent on leave, 1951-1952.

² In residence spring semester only, 1951-1952.

12. Elementary French. Intensive Course. (8) I and II.
Miss Habis-Reutinger in charge
Sections meet for two hours, five days per week.
2. Elementary French (continuation of 1). (4) I and II.
Sections meet five hours per week. Miss Habis-Reutinger in charge
Prerequisite: two years of high school French or course 1.
3. Intermediate French. (4) I and II. Mr. Eustis in charge
Sections meet five hours 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. Ramsey 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. Mr. Putter 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. Meylan
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 course 125.

- 101A-101B. Intensive Reading, Grammar, and Composition. (3-3) Yr.
Beginning each semester. Mr. Bissell 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. Open only to non-majors.
- 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. ———
- *115A-115B. Modern French Drama. (2-2) Yr. Mr. Brenner

* Not to be given, 1951-1952.

- 116A-116B. French Literature from 1885 to 1914. (2-2) Yr. _____
- 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. Mr. Meylan
 Course 125 is required of all candidates for the Certificate of Completion in French. Normally to be taken in the junior year. Enrollment limited to fifteen students.
- 130A-130B. Advanced Grammar and Composition. (3-3) Yr. Mr. Bissell
 Prerequisite: course 101A-101B.
 Required of all candidates for the Certificate of Completion of the teacher-training curriculum.
- 131A-131B. Advanced Literary Composition. (3-3) Yr. Mr. Bissell
 Prerequisite: course 101A-101B.
 Required of all candidates for the M.A. degree.
 A course in the development of an ability to write good literary French.
- 134A-134B. Survey of French Culture and Institutions. (2-2) Yr.
 Miss Habis-Reutinger
 Required of all candidates for the Certificate of Completion in French.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
 The Staff (Mr. Putter in charge)

COURSES IN WHICH NO KNOWLEDGE OF FRENCH IS REQUIRED

39. French Literature in English Translation. (2)
 (Formerly numbered 9.)
 Lectures (in English) and collateral reading of representative works in English translation.
- 39A. To the End of the Eighteenth Century. (2) I.
 No prerequisite. Mr. Eustis, Mr. Loy, Mr. Putter, Mr. Ramsey,
 Mr. Rowbotham
- 39B. The Nineteenth Century. (2) II.
 No prerequisite. Mr. Eustis, Mr. Loy, Mr. Putter, Mr. Ramsey,
 Mr. Rowbotham
- 39C. The Contemporary Period. (2) I. Mr. Carmody
 Prerequisite: course 39B or consent of the instructor.
- 122A-122B. Readings in French Literature of the Middle Ages. (2-2) Yr.
 Mr. Walpole
- *123A-123B. Renaissance and Reformation in French Literature. (2-2) Yr.
 Mr. Meylan
- *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.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

Course 201A or 206A is required of all candidates for the M.A. degree.

* Not to be given, 1951-1952.

- 201A-201B. Historical Grammar. (3-3) Yr. Mr. Carmody
- *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
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. _____
- 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)

GEOGRAPHY

John B. Leighly, Ph.D., *Professor of Geography.*
 Carl O. Sauer, Ph.D., *Professor of Geography (Chairman of the Department).*
 John E. Kesseli, Ph.D., *Associate Professor of Geography.*
 James J. Parsons, Ph.D., *Assistant Professor of Geography.*



Edwin M. Loeb, Ph.D., *Lecturer in Geography.*
 Nicholas T. Mirov, Ph.D., *Lecturer in Geography.*
 Erhard Rostlund, 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 69.

Departmental Major Adviser: Mr. Kesseli.

* Not to be given, 1951-1952.

Preparation for the Major.—Required: courses 1, 2, and 4. Recommended: Botany 12, Geology 1, 3, and a course in elementary statistics.

The Major.—24 units of upper division work in geography or from 18 to 21 units of upper division work in geography and from 3 to 6 units chosen under an approved plan from the following: Anthropology 118A–118B; Botany 151; Economics 110, 113, 188A; Forestry 103, 125; Genetics 100; History 161A–161B; Sociology and Social Institutions 121, 122; Soil Science 101, 105.

Each program should normally include courses 101 or 102, 105A, 121, and 151.

LOWER DIVISION COURSES

1. Introduction to Geography: Physical Elements. (3) I and II.
Two lectures and two section meetings 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. Economic Geography. (3–3) Yr. Mr. Parsons
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 the instructor.
102. Field Geography. (3) II. Mr. Parsons
Field trips Saturdays.
Study of type areas of physical and cultural interest. Admission only after consultation with the instructor.
- 105A–105B. Cartography. (3–3) Yr. Mr. Leighly
One lecture hour and two three-hour laboratory periods per week.
105A: Map Projections. 105B: Map Content.
Prerequisite: consent of the 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 the 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 the instructor.
121. Geography of North America. (3) I. Mr. Rostlund
- 122A. Geography of Middle America. (3) I. Mr. Sauer
- 122B. Geography of South America. (3) II. Mr. Sauer
- 123A. Geography of Mediterranean Europe. (3) I. Mr. Rostlund
- 123B. Geography of Northern Europe. (3) II. Mr. Rostlund
124. Geography of the Soviet Union. (3) I. Mr. Mirov
- 125A. Geography of India and Malaysia. (3) I. Mr. Parsons
- 125B. Geography of China and Japan. (3) II. _____
127. Geography of Southern Africa. (3) I. Mr. Loeb
Physical and cultural geography of Africa south of the northern boundaries of British East Africa and the Belgian Congo. Distribution and cultures of native peoples; geographical factors affecting the course of European settlement and the subsequent development and exploitation of mineral and other resources; problems arising from the impact of European, Asiatic, and native peoples and economies.
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. Principles of Geography. (2) II. Mr. Leighly
Prerequisite: three upper division courses in geography.
Reports and conferences on the objectives, subdivisions, and methods of geography, with special reference to different schools of geographic thought as expressed in recent literature.
153. Natural Resources and Their Exploitation. (3) II. Mr. Sauer
Conservative and destructive uses of habitat (occupied area) by cultures (economic systems) throughout human time, with emphasis on contemporary problems.
161. Geography of Domesticated Plants and Animals. (3) I. Mr. Sauer
A consideration of the processes, times, and places of appropriation of elements of flora and fauna into agricultural economics and of the successive geographic dispersal of the domesticated forms.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The Staff (Mr. Kesseli and Mr. Sauer in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

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. _____
203. Seminar in Cultural Geography. (2) II. Mr. Sauer
205. Seminar in Physical Geography. (2) II. Mr. Kesseli
Topic: Analysis of land forms.
- *206. Seminar in Physical Geography. (2) II. _____
207. Seminar in History of Geography. (2) I. Mr. Leighly
- *208. Seminar in Economic Geography. (2) I. _____
- 219A-219B. Research. (2-2) Yr.
The Staff (Mr. Sauer and Mr. Kesseli in charge)

GEOLOGICAL SCIENCES

Perry Byerly, Ph.D., *Professor of Seismology (Chairman of the Department of Geological Sciences)*.

Adolf Pabst, Ph.D., *Professor of Mineralogy*.

Nicholas L. Taliaferro, Ph.D., *Professor of Geology*.

* Francis J. Turner, Sc.D., *Professor of Geology*.

Howel Williams, Sc.D., *Professor of Geology*.

Andrew C. Lawson, Ph.D., Sc.D., LL.D., *Professor of Geology and Mineralogy, Emeritus*.

George D. Louderback, Ph.D., LL.D., *Professor of Geology, Emeritus*.

Charles M. Gilbert, Ph.D., *Associate Professor of Geology*.

† Norman E. A. Hinds, Ph.D., *Associate Professor of Geology*.

Jean Verhoogen, M.E., Ph.D., *Associate Professor of Geology*.

Charles G. Higgins, Ph.D., *Assistant Professor of Geology*.

Garniss H. Curtis, Ph.D., *Instructor in Geology*.

Robert S. Creely, A.B., *Associate in Geology for the fall semester*.

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 69.

MAJOR IN GEOLOGY

Departmental Major Adviser: Mr. Gilbert.

Preparation for the Major.—Required: Chemistry 1A-1B; Physics 2A-2B; Geology 1 or 5 (5 recommended); Geology 3; Mineralogy 6; Mathematics 3A-3B; Engineering 1A-1B. For those intending to emphasize mineralogy and petrology, Chemistry 5 is required. It is recommended that prospective major students take Mathematics 4A-4B and Physics 3A-3B. In addition, Paleontology 1 is desirable for those intending to emphasize Petroleum or Historical and Stratigraphic Geology, and Chemistry 5 or Metallurgy 2A is desirable for those intending to emphasize Metalliferous Geology.

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.

* Not to be given, 1951-1952.

† In residence spring semester only, 1951-1952.

† Sabbatical leave in residence spring semester, 1951-1952.

(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.

(4) Where necessary, Engineering 1A-1B may be postponed to the upper division.

The Major.—All major programs must include a minimum of 30 units in upper division courses in geology and related subjects. 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 106 (3), 108 (2), 109 (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), 106 (3), and two of the following: Geology 109 (3), 116 (2), Mineralogy 103 (3), and Mining 111B (3). Recommended electives are Metallurgy 2A-2B (6), Mineralogy 105 (2), Geology 108 (2), Paleontology 102 (3), 112 (4), Mining 111A (3), Soil Science 101 (3).

III. Emphasis on Petroleum Geology: Geology 111 (2), two semesters of upper division Paleontology (7-8), and either 1) Geology 104A-104B (6), or 2) Geology 116 (2) and Geology 121 (4) or 122A-122B (4). Recommended electives are Paleontology 102 (3), 111 (4), 112 (4), 114 (4), Geology 107 (2), 108 (2), Geography 109 (3), and 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 program.

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 (4), 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 106 (3), 108 (2), 111 (2).

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. Verhoogen.

Preparation for the Major.—Required: Chemistry 1A-1B; Geology 5 (or 1), 3; Mathematics 3A-3B, 4A-4B; Mineralogy 6 or 4A; 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
(Formerly numbered 1A.)
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. Turner
(Formerly numbered 1B.)
Three lectures and one demonstration and discussion section per week.
Prerequisite: Geology 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. Williams
(Formerly numbered 2.)
Three lectures and one section meeting per week.
Not open to students who have taken or are taking Geology 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. Higgins, Mr. Creely, Mr. Taliaferro, Mr. Curtis
102A: Mr. Gilbert, Mr. Higgins, Mr. Creely, Mr. Curtis; 102B: Mr. Gilbert, Mr. Taliaferro, Mr. Curtis.
One lecture per week and field trips all day Saturday.
Prerequisite: Geology 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. Gilbert, Mr. Creely
I: Mr. Taliaferro, Mr. Creely; II: Mr. Gilbert.
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: Geology 5 (or 1), Mineralogy 6 (or 4A), 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 4A or 6, and for Geology 104B, Geology 103.
The optical properties of crystals, followed by determination of minerals and then of rocks by means of the microscope. Approximately one-third of the year is devoted to each of these three topics.
106. Economic Geology, Metalliferous Deposits. (3) I. Mr. Curtis
Three lectures per week and occasional conference hours.
Prerequisite: Geology 103 (may be taken concurrently).
107. Geology of North America. (2) II. Mr. Hinds
Two lectures per week and occasional conference hours.
Prerequisite: Geology 3, 102A, and 103.
108. Economic Geology, Nonmetalliferous Deposits. (2) I. Mr. Gilbert
Two lectures per week.
Prerequisite: Geology 5 (or 1) Geology 103 (may be taken concurrently), and Mineralogy 6 (or 4A).
The geological characteristics and mode of occurrence of the industrial minerals and solid fuels, and the geological problems involved in their recovery and utilization.
109. Microscopy of the Metallic Ores. (3) II. Mr. Curtis
One lecture and two three-hour laboratory periods per week.
Prerequisite: Geology 106.
Introduction to the study of polished surfaces of the metallic ores. Methods of preparation; properties and identification; ore textures; alteration products and associated gangue minerals.
111. Petroleum Geology. (2) II. _____
Prerequisite: Geology 5 (or 1), Mineralogy 6 (or 4A).
The geology of petroleum and in addition a brief discussion of ground water.
116. Structural Geology. (2) II. Mr. Taliaferro
Prerequisite: Geology 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 Geology 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, Mr. Higgins
Prerequisite: Geology 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.

- 120A-120B. Elementary Geophysics. (2-2) Yr. Mr. Byerly, Mr. Verhoogen
 120A: Mr. Byerly; 120B: Mr. Verhoogen.
 Prerequisite: Physics 2A-2B, Mathematics 3A-3B, Geology 5 (or 1).
 Students who are taking or have taken Geology 121 may not receive credit for 120A; those who have taken 122A may not receive credit for 120B.
 120A: Seismology. (Formerly numbered 120.)
 120B: Gravitational, magnetic, and electrical properties of rocks.
121. Practical Seismometry. (4) II. Mr. Byerly
 Three lectures and one three-hour laboratory period 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: Geology 5 (or 1), Mathematics 4A-4B, and Physics 2A-2B or equivalent.
 122A. General geophysics.
 122B. Applications to geologic problems.
199. Special Study for Advanced Undergraduates. (1-4) I and II.
 The Staff (Mr. Gilbert 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 139)

204. The Theory of Waves in an Elastic Medium. (2) I. Mr. Byerly
 The theory of stress and strain, of equilibrium and wave motion in elastic solids, with special application to earthquake waves.
206. Seminar in Geology of Metalliferous Deposits. (2) I. Mr. Curtis
 Prerequisite: Geology 106.
- 207A. Seminar in Volcanology. (2) I. Mr. Williams
 The origin and nature of volcanic processes; principal types of activity as exemplified by modern volcanoes; characters and classification of lavas and pyroclastic rocks.
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: Geology 102A-102B, 103, and a course in historical geology, such as course 3 or 107.
 Critical study of literature, with discussion of evidence and scientific method; the main reported facts and theories of the history of sedimentation, volcanism, the major earth movements, and geographical changes in California and bordering areas covered in reports, discussions, and occasional lectures.

- 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: Geology 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) II. Mr. Turner
Prerequisite: Geology 210A or 214A, and consent of the instructor.
Use of the universal stage in petrographic determinations and in petrofabric analyses.
- *213. Seminar in Geomorphology. (2) II. Mr. Hinds
Prerequisite: Geology 117 or its equivalent.
The topics to be considered will vary from year to year.
- 214A-*214B. Advanced Petrographic Laboratory. (2-5; 2-5) Yr. Mr. Turner
Laboratory periods and occasional conferences, by arrangement.
Instruction in the use of the universal stage will be given to selected students.
Prerequisite: Geology 104A-104B. Recommended: Mineralogy 105. A reading knowledge of French or German is required of candidates for the Ph.D. degree.
Metamorphic and igneous rocks in alternate years.
214A will be given in the spring semester.
- 215A-*215B. Seminar in Sedimentation. (2-2) Yr. Mr. Turner
Prerequisite: Geology 104A-104B. A reading knowledge of French or German is required of candidates for the Ph.D. degree.
215A will be given in the spring semester.
216. Seminar in Structural Geology. (2) II. Mr. Taliaferro
Prerequisite: Geology 102A-102B, 103, 116, and a course in historical geology.
Folding and faulting, growth of mountains; a study of special topics in structural geology. Reports and discussions, with occasional lectures.
217. Advanced Seismometry. (2) II. Mr. Byerly
The general mathematical theory of the seismograph; discussion of the problems of modern seismometry and of recent results.
- 218A-218B. Seminar in Seismology. (2-2) Yr. Mr. Byerly
Critical study of original literature relating to seismological problems.
The content will vary from year to year.
220. Research. (1-5) I and II. The Staff (Mr. Taliaferro in charge)

MINERALOGY

LOWER DIVISION COURSE

6. Introduction to Mineralogy. (4) I and II. Mr. Higgins, Mr. Pabst
(Formerly numbered 4A-4B.)
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.

* Not to be given, 1951-1952.

UPPER DIVISION COURSES

103. Mineralogy. (3) II. Mr. Pabst
Prerequisite: Mineralogy 6 (or 4A) and Chemistry 1B.
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, Geology 103.
Lectures on the occurrence, association and habit of minerals.
107. Crystallography. (3) I. Mr. Pabst
Prerequisite: Mathematics 3A-3B and consent of the 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

(Concerning conditions for admission to graduate courses, see page 139)

Research. (See Geology 220.)

282. Problems in Crystallography. (1-2) I and II. Mr. Pabst
Prerequisite: consent of the instructor.
Laboratory exercises in crystal measurement and description.

GERMAN

Clair Hayden Bell, Ph.D., *Professor of German.*

Edward V. Brewer, M.A., *Professor of German (Chairman of the Department).*

Arthur G. Brodeur, Ph.D., *Professor of Germanic Philology and English.*

Archer Taylor, Ph.D., *Professor of German.*

Hans M. Wolff, J.D., Ph.D., *Professor of German.*

Lawrence M. Price, Ph.D., *Professor of German, Emeritus.*

Edmund Kurt Heller, Ph.D., *Associate Professor of German, Emeritus.*

Alice P. Tabor, Ph.D., *Assistant Professor of German, Emeritus.*

Erwin G. Gudde, Ph.D., *Associate Professor of German.*

C. Grant Loomis, Ph.D., *Associate Professor of German.*

Philip Motley Palmer, Ph.D., *Associate Professor of German.*

† Franz Schneider, Ph.D., *Associate Professor of German.*

Madison S. Beeler, Ph.D., *Assistant Professor of German.*

Marianne Bonwit, Ph.D., *Assistant Professor of German.*

Andrew O. Jászai, Ph.D., *Assistant Professor of German.*

O. Paul Straubinger, Ph.D., *Assistant Professor of German.*

Peter Bruning, Ph.D., *Instructor in Dutch and German.*

Joseph Mileck, Ph.D., *Instructor in German.*

Edith J. Lewy, A.B., *Associate in German.*

Letters and Science List.—All undergraduate courses in German are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

† Sabbatical leave in residence spring semester, 1951-1952.

Departmental Major Adviser: Miss Bonwit.

Preparation for the Major.—German 1, 2, 3, 4, or their equivalents, completed satisfactorily.

The Major.—Requirement: 24 units in upper division courses, including one full year's course in composition and at least 6 units made up from the senior courses 114, 118A, 118B, and 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 316. Students looking forward to the secondary credential should include courses 118A–118B, 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, including courses 118A, 118B.

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. Palmer 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.
2. Elementary German (continuation of 1). (4) I and II.
Mr. Palmer in charge
Prerequisite: course 1 or two years of high school German.
3. Intermediate German. (4) I and II. Mr. Jászi in charge
Prerequisite: course 2 or three years of high school German.
Section 1 is for students primarily interested in conversational German.
4. Intermediate German. (4) I and II. Mr. Jászi in charge
Prerequisite: course 3 or four years of high school German.
- 1G. German for Graduate Students. (No credit) I and II.
Mr. Straubinger in charge
A course designed to prepare students for the graduate reading examinations. Sections will be offered in the humanities, biological sciences, physical sciences and social sciences.
- 3S. Scientific German. (3) I and II. Mr. Straubinger in charge
Prerequisite: course 2 or equivalent. Open only to students in the colleges of Chemistry and Engineering, premedical and pre dental students, and students in the College of Letters and Science who are majoring or preparing for a major in one of the scientific departments.
- 4S. Scientific German. (3) I and II. Mr. Mileck
Prerequisite: course 3S or 3 or equivalent.
4S may be repeated without duplication of credit.
- 4M. Medical German. (3) I and II. Mr. Straubinger
(Formerly numbered 3M.)
Prerequisite: course 3 or 3S or equivalent.

39. Great Writers in German Literature. (1)
(Formerly numbered 9.)
Any one of these courses is open to students in all departments of the University, major students in German excepted. No knowledge of German required.
- 39A. Medieval Period. (1) I, Mr. Taylor.
- 39B. Eighteenth Century. (1) II, Miss Bonwit.
- 39C. Nineteenth Century. (1) I, Mr. Schneider.
- 39D. Twentieth Century. (1) II, Mr. Loomis.

UPPER DIVISION COURSES

Prerequisite: 16 units of lower division courses.

100. Introduction to Modern German Literature. (3) I and II.
Miss Bonwit, Mr. Gudde
104. Dramas of the Nineteenth Century. (3) I and II.
Mr. Wolff, Mr. Straubinger
106. Schiller's Dramas. (3) I. Mr. Brewer
107. Schiller's Poetry, Aesthetic and Historical Writings. (3) II.
Mr. Brewer
108. Introduction to Goethe. (3) I. Mr. Loomis
Götz von Berlichingen, Urfaust, Werther.
109. Goethe's Verse Dramas; *Tasso, Iphigenie, Faust*, Part I. (3) II.
Mr. Schneider
110. The German Ballad and Lyric Poetry except Goethe. (1) I.
Mr. Schneider
111. Goethe's Poems. (1) II. Mr. Schneider
- *112. Survey of German Culture and Institutions. (3) II. Mr. Gudde
Open to all upper division students who have a reading knowledge of German, and recommended for prospective teachers.
- *114. German Literature of the Nineteenth Century. (3) II. Mr. Schneider
Prerequisite: 6 units from any of the above-listed upper division courses.
- *115. Nietzsche. (3) II. 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: same as for course 114.
- 118B. History of German Literature from the Reformation to the Romantic Movement. (3) II. Mr. Wolff
Prerequisite: same as for course 114.
Course 118A is not prerequisite to 118B.
124. German Poetry of the Twentieth Century. (2) II. Mr. Jászi
Prerequisite: same as for course 114.

* Not to be given, 1951-1952.

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.
130A: Mr. Mileck; 130B: Mr. Palmer. Mr. Mileck, Mr. Palmer
- 131A-131B. Advanced Grammar and Composition. (2-2) Yr. Miss Bonwit
Prerequisite: grade C or higher in course 130A-130B.
- 135A. Middle High German. (3) I. Mr. Bell
Prerequisite: same as for course 114. 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. Brewer in charge

DUTCH

1. Elementary Dutch. Beginners' Course. (4) I. Mr. Bruning
2. Elementary Dutch (continuation of 1). (4) II. Mr. Bruning

GERMAN

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

Prerequisite: for the literary courses, course 118A or 118B; 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.
201. Germanic Heroic Poetry. (3) II. Mr. Brodeur
(Formerly given as English 207.)
203. Studies in Middle High German Literature. (2) I. Mr. Bell
Prerequisite: course 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

* Not to be given, 1951-1952.

206. German Literature During the Seventeenth Century. (2) II. Mr. Loomis
- *214. Lessing and His Time. (3) I. _____
220. Goethe to the Period of the Italian Journey. (2) I. Mr. Wolff
221. Goethe from the Period of the Italian Journey to his Death. (2) II. Mr. Wolff
- *228. Early German Romanticism: 1795-1810. (3) II. Mr. Brewer
- *229. Kleist, Büchner, Grabbe. (2) I. Mr. Wolff
- *230. Grillparzer. (2) I. Mr. Straubinger
238. German Realism, 1850-1900. (2) II. Miss Bonwit
242. *Das Junge Deutschland*. (2) I. Mr. Schneider
Special emphasis on Heine and Gutzkow.
298. Special Study for Graduate Students. (1-4) I and II.
(Formerly numbered 250.) Mr. Brewer in charge

Germanic Linguistics

For the courses in English Philology, see the Department of English, page 308.

- *260. Germanic Linguistics. (3) II. 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
290. Seminar in Germanic Linguistics. (2-3) II. Mr. Palmer

GREEK

For courses in the Greek language and literature, see under Department of Classics, page 235.

HISTORY

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*.

Lawrence A. Harper, J.D., Ph.D., *Professor of American History*.

* Not to be given, 1951-1952.

John D. Hicks, Ph.D., *A. F. and May T. Morrison Professor of History.*

Robert J. Kerner, Ph.D., LL.D., Litt.D., *Sather Professor of History.*

Lawrence Kinnaird, Ph.D., *Professor of History.*

Franklin C. Palm, Ph.D., *Professor of Modern European History.*

² Raymond J. Sontag, Ph.D., *Sidney Hellman Ehrman Professor of European History.*

Kenneth M. Stamp, Ph.D., *Professor of History.*

¹ John J. Van Nostrand, Ph.D., LL.D., *Professor of Ancient History (Chairman of the Department).*

Herbert E. Bolton, Ph.D., Litt.D., L.H.D., LL.D., *Sather Professor of History, Emeritus.*

Walton E. Bean, Ph.D., *Associate Professor of History.*

Woodbridge Bingham, Ph.D., *Associate Professor of Far Eastern History.*

Delmer M. Brown, Ph.D., *Associate Professor of History.*

James F. King, Ph.D., *Associate Professor of History.*

George V. Lantzeff, Ph.D., *Associate Professor of History.*

Paul B. Schaeffer, Ph.D., *Associate Professor of European History.*

Engel Sluiter, Ph.D., *Associate Professor of History.*

William N. Davis, Ph.D., *Assistant Professor of History.*

* Gordon Griffiths, Ph.D., *Assistant Professor of History.*

Charles Jelavich, Ph.D., *Assistant Professor of History.*

Joseph R. Levenson, Ph.D., *Assistant Professor of History.*

Armin Rappaport, Ph.D., *Assistant Professor of History.*

♡ Reuben H. Gross, Jr., 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; courses 17A–17B and 19A–19B are open to all students above the freshman year; the A part of any of the introductory courses should ordinarily precede the B part.

Foreign Language in the Lower Division.—All students who intend to take upper division courses in history are advised to acquire a reading knowledge of at least one of the following languages before they reach their junior year: French, German, Italian, Latin, Spanish.

Letters and Science List.—All undergraduate courses in history are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

The American History and Institutions requirement may be satisfied by any two of the following courses in history: 8B, 17A, 17B, 167A, 167B, 172A, 172B, 173A, 173B, 173C, 174A, 174B, 176A, 176B, 177A, 177B, 187A, 187B.

Department Major Advisers: Mr. Schaeffer, Chairman; Mr. King, Mr. Davis.

Preparation for the Major.—Required: History 4A–4B; and 8A–8B or 17A–17B or 19A–19B (according to the intended field of concentration); and either Economics 1A or Geography 1.

The Major.—Students majoring in history must complete 24 upper division units in history, including:

- (a) *In the junior year:* History 101 and at least one year course of broad scope, preparatory to more specialized work in the same field (Europe, Western Hemisphere, Far East).
- (b) *In the junior or senior year:* a second year course in a different field from that chosen under (a) above.

¹ In residence fall semester only, 1951–1952.

² In residence spring semester only, 1951–1952.

* Absent on leave, 1951–1952.

♡ On military leave, 1951–1952.

- (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 divisions.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the major in history.

Honor Students in the Upper Division.—Students who complete a major in history with distinction are eligible for recommendation for honors upon passing the comprehensive examination. Attention is directed to course 198 and to page 70.

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, ANNOUNCEMENT IN THE SOCIAL SCIENCES, and confer with the graduate adviser.

LOWER DIVISION COURSES

In courses 4A-4B, 8A-8B, 17A-17B, and 19A-19B, weekly sections are organized to give supplementary instruction in historical geography, map work, bibliography, and methods of historical study.

4A-4B. History of Western Europe. (3-3) Yr. Beginning each semester.
Mr. Jelavich, Mr. Palm, Mr. Schaeffer

Course 4A is prerequisite to 4B for freshmen.

8A-8B. History of the Americas. (3-3) Yr. Mr. Sluiter

17A-17B. History of the United States. (3-3) Yr. Beginning each semester.
Mr. Bean, Mr. Davis, Mr. Harper, Mr. Hicks, Mr. Rappaport,
Mr. Stampp

Prerequisite: sophomore standing.

19A-19B. History and Civilizations of Asia. (3-3) Yr. Mr. Bingham

19A. To 1600.

19B. Since 1600.

Prerequisite: sophomore standing.

UPPER DIVISION COURSES

101. Introduction to Historical Method and Bibliography. (3) I and II.
Two lectures per week and conference hours. Mr. Jelavich
Prescribed in the junior year for, and restricted to, students majoring
in history. Two papers and a bibliography are prepared by each student;
and the use of the library is emphasized. Enrollment is limited.

111A-111B. Ancient History. (3-3) Yr. Mr. Van Nostrand

111A. Greek history to the Roman conquest.

111B. Roman history to the fourth century A.D.

*113. History of Ancient Mediterranean Colonization. (3) I.

* Not to be given, 1951-1952.

- *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
- *134A-134B. Western Europe: Its Cultural History since the French
 Revolution. (3-3) Yr. Mr. Sontag
- 135A-135B. History of Russia and Poland to the Crimean War. (3-3) Yr.
 Mr. Lantzeff
- 136A-136B. History of Russia and Poland since the Crimean War. (3-3) Yr.
 Mr. Kerner
 136A. Internal History of Russia and Poland with emphasis on Soviet
 Russia.
 136B. Russia and the Soviet Union in world politics and world eco-
 nomics.
- *137A-137B. History of Russian Civilization. (2-2) Yr. Mr. Lantzeff
- 138A-138B. History of Russian Central Asia, Siberia, and Alaska. (3-3) Yr.
 Mr. Lantzeff
- 139A-139B. History of Southeastern Europe and the Near East. (3-3) Yr.
 Mr. Jelavich
 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. (2-2) Yr. Mr. Griffiths
- *143A-143B. Modern Germany from the Eighteenth Century. (2-2) Yr.
 143A. Eighteenth and Nineteenth Centuries. Mr. Sontag
 143B. Twentieth Century.
- *144A-144B. European Diplomatic History. (3-3) Yr. Mr. Gross
 144A. 1848 to 1914.
 144B. 1914 to the present.

* Not to be given, 1951-1952.

145. The Revolutionary Era in Europe. (3) I. Mr. Palm
146. Europe Since 1870. (3) II. Mr. Palm
- *148. Recent World History. (3) Mr. Kerner
The historical background since the First World War and the current situation in world politics and world economics.
- *150. Medieval England. (3) I. _____
- 151A-151B. History of England, from 1485 to the Present. (3-3) Yr.
151A. 1485-1740. Mr. Guttridge
151B. 1740 to the present.
- *152. Constitutional History of England to 1485. (3) I. _____
Prerequisite: course 150 or 121A-121B.
- *154. England and the American Colonies to 1783. (2) I. Mr. Guttridge
Prerequisite: course 151A or equivalent.
- *155A-155B. The British Commonwealth and Empire since 1783. (3-3) Yr.
Prerequisite: course 151B or equivalent. Mr. Gross
157. Burke and His Age, 1750-1800. (2) I. Mr. Guttridge
Reading and discussion.
Prerequisite: course 151A-151B or equivalent.
- *160A-160B. History of Spain and Portugal. (3-3) Yr. Mr. Van Nostrand
- 161A-161B. Hispanic-American History. (3-3) Yr. Mr. King, Mr. Sluiter
161A. The Colonies: Mr. Sluiter.
161B. Since Independence: Mr. King.
- 162A-162B. History of the Caribbean Area. (2-2) Yr. Mr. King
163. History of Brazil. (3) II. Mr. Sluiter
- 166A-166B. History of Mexico. (2-2) Yr. Mr. Hammond
166A. Colonial Period.
166B. National Period.
- 167A-167B. History of the Foreign Relations of the United States. (3-3) Yr.
167A. 1776-1880. Mr. Rappaport
167B. 1880 to the present.
- 170A-170B. American Colonial History. (3-3) Yr. Mr. Bridenbaugh
170A. The American Colonies to 1763.
170B. The American Revolution, 1763-1789.
- 172A-172B. Constitutional History of the United States. (2-2) Yr.
Mr. Harper
Prerequisite: course 17A-17B or consent of the instructor.
- 172C-172D. Constitutional History of the United States. (1-1) Yr.
Mr. Harper
A discussion group for students enrolled in 172A-172B, who wish to do additional work in the same field.
173. The Era of Sectional Conflict. (3) 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)

* Not to be given, 1951-1952.

- 174A-174B. Recent History of the United States. (3-3) Yr. Mr. Hicks
 174A. 1900-1925.
 174B. 1925 to the present.
- 176A-176B. Social History of the United States. (3-3) Yr.
 176A. 1763-1865. Mr. Bridenbaugh
 176B. 1865 to the present.
- 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. Mr. Kinnaird
- *183. Economic Exploitation of Colonial America. (3) II. Mr. Sluiter
- 187A-187B. The West in United States History. (2-2) Yr. Mr. Davis
- 189A-189B. History of California. (2-2) Yr. Mr. Kinnaird
 189A. Spanish and Mexican Period.
 189B. American Period.
- *192A-192B. Far Eastern Diplomatic History. (3-3) Yr. _____
- 193A-193B. The Middle Periods of Chinese History, 600-1600. (2-2) Yr.
 Mr. Bingham
 Prerequisite: an elementary knowledge of Chinese history.
- 194A-194B. History of Modern China. (3-3) Yr. Mr. Levenson
 Recommended: a knowledge of earlier Chinese history.
 From the 17th century to the establishment of the Central People's Government (Oct. 1, 1949). Emphasis will be placed on the interplay of political, economic, and cultural forces in "traditional" and "transitional" China, the Chinese background of contemporary Chinese conflict.
- 194C. Intellectual History of Modern China. (2) I. 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. Brown
 195A. Period of Chinese Influence.
 195B. Period of Western Influence.
196. History of Japanese Nationalism. (3) II. Mr. Brown
- *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 seniors and graduate students only.
 Prerequisite: for students whose major is history, at least a B average in all history courses undertaken; for others, at least a B average in all courses undertaken.

* Not to be given, 1951-1952.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

201. Advanced Studies in the Sources and General Literature of the Several Fields of History. (2 or 4) I and II. The Staff
 I. Japanese history (2), Mr. Brown; Latin American history (2), Mr. King; United States history (2), Mr. Bean, Mr. Davis. II. English history (2), Mr. Guttridge; Latin American history (2), Mr. Sluiter; United States history (2), Mr. Hicks, Mr. Stamp; Chinese history (2), Mr. Levenson.
202. Historical Method and Bibliography. (2) I. Mr. Van Nostrand
 Designed especially for candidates for higher degrees in history. Stress is laid on practical exercises.
- *205. Historical Auxiliaries to Medieval Studies. (2) _____
- *211A-211B. Seminar in Ancient History. (2-2) Yr. Mr. Van Nostrand
- 221A-221B. Seminar in Medieval History. (2-2) Yr. Mr. Schaeffer
- *225A-225B. Seminar in Early Medieval History. (2-2) Yr. _____
- *231A-231B. Seminar in Early Modern European History. (2-2) Yr. Mr. Griffiths
- 235A-235B. Seminar in Russian History. (2-2) Yr. Mr. Lantzeff
- 236A-236B. Seminar in Modern Slavic History. (2-2) Yr. Mr. Kerner
- 241A-241B. Seminar in Modern European History. (2-2) Yr. Mr. Palm
- *243A-243B. Seminar in Modern European History. (2-2) Yr. Mr. Sontag
- 251A-251B. Seminar in English History. (2-2) Yr. Mr. Guttridge
- *260A-260B. Seminar in the History of Spain. (2-2) Yr. Mr. Van Nostrand
 Prerequisite: course 160A-160B, a reading knowledge of Spanish, and French or German.
- 261A-261B. Seminar in Hispanic-American History. (2-2) Yr. Mr. King
- *266A-266B. Seminar in Mexican History. (2-2) Yr. Mr. Hammond
- 267A-267B. Seminar in the Diplomatic History of the United States. (2-2) Yr. Mr. Rappaport
 Prerequisite: course 167A-167B.
- 271A-271B. Seminar in the History of the American West. (2-2) Yr. Mr. Davis
- 272A-272B. Seminar in the Colonial Period of United States History. (2-2) Yr. Mr. Harper
- 273A-273B. Seminar in the History of the Old South, the Civil War and Reconstruction. (2-2) Yr. Mr. Stamp
- 274A-274B. Seminar in the Recent History of the United States. (2-2) Yr. Mr. Hicks
- 276A-276B. Seminar in American Social History, 1700-1900. (2-2) Yr. Mr. Bridenbaugh

* Not to be given, 1951-1952.

- 277A-277B. Seminar in the Early National Period of United States History. (2-2) Yr. Mr. Bean
- 281A-281B. Seminar in North American History. (2-2) Yr. Mr. Kinnaird
- 283A-283B. Seminar in Hispanic-American History. (2-2) Yr. Mr. Sluiter
- 291A-291B. Seminar in the History of the Far East. (2-2) Yr. Mr. Bingham
- 294A-294B. Seminar in the History of Modern China. (2-2) Yr. .
Prerequisite: an elementary knowledge of Chinese. Mr. Levenson
- 295A-295B. Seminar in Japanese History. (2-2) Yr. Mr. Brown
298. Directed Research. (2-4) I and II. The Staff

HOME ECONOMICS

Jessie V. Coles, Ph.D., *Professor of Home Economics.*

Agnes Fay Morgan, Ph.D., *Professor of Home Economics (Chairman of the Department).*

Ruth Okey, Ph.D., *Professor of Home Economics.*

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, Ph.D., *Assistant Professor of Home Economics.*

Mary S. Spencer, M.S., *Acting Instructor in Home Economics.*



Lotte Arnrich, B.S., *Lecturer in Home Economics.*

R. Lorene Dryden, M.A., *Associate in Home Economics, Davis.*

Doris F. Heineman, B.A.E., *Lecturer in Home Economics, Davis.*

Mildred S. Jentsch, M.S., *Associate in Home Economics, Davis.*

Barbara I. Keane, M.S., *Lecturer in Home Economics.*

Agnes C. McClelland, M.A., *Lecturer in Home Economics.*

Letters and Science List.—Courses 1A-1B, 6, 10, 14, 101A-101B, 111, 112A-112B, 114, 118A-118B, 132, 142, 152, and 160 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Curriculum in Home Economics.—The requirements for this curriculum offered in the College of Agriculture are stated on page 75.

(GIVEN AT BERKELEY)

LOWER DIVISION COURSES

- 1A-1B. Experimental Food Study. (3-3) Yr. Beginning each semester.
Lecture and laboratory. Miss Kennedy, Mrs. Spencer
Prerequisite: Chemistry 1A and 8. Recommended: Bacteriology 1 or 2.
Production and composition of food and principles involved in food preparation and preservation.

6. Introduction to Textiles. (3) I and II. Miss Jones
(Formerly numbered 7.)
Lectures and laboratory.
Prerequisite: Chemistry 1A and 8.
Study of plant, animal, and synthetic fibers used in textiles and of the finished textile materials.
7. Elementary Clothing Study. (3) I and II. Miss McClelland, Mrs. Keane
(Formerly numbered 5.)
Lecture and laboratory.
Prerequisite: Decorative Art 6A-6B.
Practical and cultural problems in modern garment design and construction.
10. Elementary Nutrition. (2) I and II. Mrs. Cook
A nontechnical presentation of the modern knowledge of foods and nutrition.
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) I and II. _____
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. Spencer
Lectures and field or laboratory work.
Prerequisite: courses 1A-1B, 141 (may be taken concurrently).
Field observation of manufacturing and distribution to observe practices related to problems of consumers including those buying foods in large quantities. Laboratory study of qualities of food in relation to use and price.
- 101A. Food Analysis. (3) I. Miss Kennedy
Lecture and laboratory.
Prerequisite: course 1A-1B and Chemistry 1B and 8; or Chemistry 1B and 8 with grade of at least B.
The principles of quantitative analysis applied to food materials; chemical analysis of typical carbohydrate, fat, and protein foods.
- 101B. Advanced Food Analysis. (3) II. Miss Kennedy
Lecture and laboratory.
Prerequisite: course 101A or Chemistry 5 with a grade of at least B.
Official analytical methods and legal standards used in the chemical analysis of sugars, grain products, dairy products, fats and oils, meats, etc. Examination of foods for deterioration and adulteration.

* Not to be given, 1951-1952.

- *108. Introduction to Research in Food Preparation and Control. (2) II.
(Formerly numbered 126.) Miss Kennedy
Two laboratory periods per week to be arranged.
Prerequisite: course 109 (to be taken concurrently).
- *109. Recent Advances in Food Technology. (2) II. Miss Kennedy
(Formerly numbered 125.)
Prerequisite: course 101A.
A proseminar on late research in the chemistry of food composition, preparation, and control.

Nutrition and Dietetics

111. Nutrition. (3) I. Mrs. Cook
(Formerly numbered 103.)
Prerequisite: Chemistry 1A or high school chemistry and Physiology 1.
A brief study of the essential nutrients and their functions in nutrition; how to determine and satisfy the food needs of the normal individual.
(Not accepted as part of the 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. Miss Okey
(Formerly numbered 102A-102B.)
Lectures and laboratory.
Prerequisite: Chemistry 1A and 8, Physiology 1, and course 1A-1B.
The food requirements of the normal individual and the special needs imposed by growth, pregnancy, lactation, and disease; the planning and computation of diets.
114. Laboratory Methods in Metabolism. (4) II. Miss Okey
(Formerly numbered 106.)
Lectures and laboratory.
Prerequisite: course 101A or Chemistry 5 and Biochemistry 102 (may be taken concurrently).
Study of qualitative and quantitative techniques and procedures used in the analysis of biological materials of importance in nutrition.
115. Therapeutic Dietetics. (3) II. Mrs. Cook
(Formerly numbered 196.)
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. Mrs. Morgan, Miss Arnrich
(Formerly numbered 120A-120B.)
Lectures and laboratory.
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) II. Mrs. Morgan, Miss Arnrich
Prerequisite: course 118A-118B with grade of B or higher, or Biochemistry 102 and 104.
Official chemical, physical, microbiological and biological assay methods for vitamins. Individual problems pertaining to animal tissue analysis, comparison of new methods with standard procedures, development of new modifications.

* Not to be given, 1951-1952.

Institution Economics

121. Institution Food Study. (4) I. Miss Gillum, ———
 (Formerly numbered 110.)
 Lectures, field or laboratory work, and three additional hours to be arranged.
 Prerequisite: courses 1A-1B, 100, and 141.
 The principles and problems involved in the preparation and service of food in institutions.
122. Institution Organization and Management. (4) II. Miss Gillum, ———
 (Formerly numbered 111.)
 Lectures and field or laboratory work.
 Prerequisite: course 121 or consent of the 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
 (Formerly numbered 497.)
 Supervised practice in administrative problems of the hospital dietetic service carried on during residence in Berkeley, and open only to selected graduate students.
427. Hospital Dietetics. (6) I and II. Miss Gillum
 (Formerly numbered 498.)
 Conferences and supervised practice in the dietetics department of the University of California Hospital and clinics.
 Open only to selected graduate students.

Child Development and Family Relationships

132. Child Psychology. (3) II. Miss Landreth
 Prerequisite: Psychology 1A and 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) II. Miss Landreth
 One lecture per week and three hours to be arranged 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
 Lectures twice a week, and laboratory in the nursery school two mornings or two afternoons a week.
 Prerequisite: course 132 and consent of the 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 Basis of Family Life Studies. (2) II. Mr. Landis
 Prerequisite: course 137 (may be taken concurrently).
 The methods and materials available for the study of modern problems of marriage and family relationships; evaluation of research data, visual aids, and materials for different ages.

PROFESSIONAL COURSE

435. Nursery School Administration. (3) I. Miss Landreth
Lectures twice a week, supervised practice in nursery schools, and related field work, six hours per week.
Open only to graduate and senior students completing the major in child development.

Family Economics

140. Home Management. (3) II. Mrs. Spencer
Lectures and laboratory.
Prerequisite: Physiology 1 and Psychology 1A.
Use of time, energy, and equipment in the home from the point of view of the satisfaction of members of the family.
- 140L. Home Management Laboratory. (1-3) II. Mrs. Spencer
Prerequisite: course 140 (may be taken concurrently).
Laboratory includes home projects or living for six to eight weeks in the home-management house under supervision of the instructor. A two-hour weekly conference period is to be arranged.

141. Consumers and the Market. (3) I. Miss Coles
Prerequisite: Economics 1A-1B (may be taken concurrently).
A study of the functions and structure of the market from the standpoint of consumers; evaluation of the guides available for consumers in buying; agencies aiding and protecting consumers.
(Not open to students who are taking or have credit for Agricultural Economics 101A or Business Administration 160.)

142. Social Problems of Families. (3) II. Miss Coles
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.
Present-day problems of families as they are related to economic and social conditions.

144. Family Finance. (3) I. Miss Coles
Prerequisite: Economics 1A-1B, and either Economics 2 or Psychology 5.
Management of personal and family finances—money income, household production, planning expenditures, credit, savings, investments, financing home ownership.

Home Furnishing

- *152. Home Furnishing. (3) II. _____
(Formerly numbered 190.)
Prerequisite: Decorative Art 6A-6B, 130A-130B (one of the latter may be taken concurrently).
A nonprofessional course designed to develop discrimination in values. A consideration of materials and their use involved in the furnishing of the home, and an analysis of current trends and materials available.

Clothing and Textiles

160. Textiles. (3) I. Miss Jones
Lecture and laboratory.
Prerequisite: course 6.
Technical analyses and evaluations of textile fibers and fabrics.

* Not to be given, 1951-1952.

162. Clothing Economics. (3) I and II. Miss Jones
Lectures and laboratory.
Prerequisite: course 6 and Economics 1A-1B.
A study of the problems involved in the selection, purchase, and care of household textiles and of clothing, of consumer protection in this field, and of the ready-to-wear and cleaning industries.
175. Advanced Clothing. (3) I and II. Miss McClelland
(Formerly numbered 167.)
Lecture and laboratory.
Prerequisite: courses 6 and 7.
Wardrobe planning and problems in advanced clothing construction.
176. Dress Design and Fashion Analysis. (3) I and II. Mrs. Keane
(Formerly numbered 163.)
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. (1-5) I and II.
The Staff (Mrs. Morgan in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

202. Seminar in Foods and Nutrition. (2) I. Miss Okey
(Formerly numbered 216.)
- *212. Seminar in Nutrition. (2) II. Mrs. Morgan
(Formerly numbered 219.)
215. Seminar in Disorders of Nutrition. (2) I. Miss Gillum
Prerequisite: course 115 or consent of the instructor.
218. Research in Food and Nutrition. (2-6) I and II. The Staff (Mrs. Morgan in charge)
(Formerly numbered 214.)
222. Seminar in Institutional Organization and Management. (2) II. Miss Gillum
Prerequisite: courses 121 and 122 or consent of the instructor.
230. Seminar in Nutrition of Development. (2) I. Mrs. Morgan
Prerequisite: graduate standing in Nutrition.
- *232. Seminar in Psychology of Early Childhood. (2) I. Miss Landreth
Prerequisite: graduate standing in Child Development or in Psychology.
237. Research in Family Sociology. (2-4) I. 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 (Mrs. Morgan in charge)
242. Seminar in Family Economics. (2) II. Miss Coles
262. Seminar in Textiles. (2) II. Miss Jones
Prerequisite: graduate standing in Textiles and Clothing.

* Not to be given, 1951-1952.

(GIVEN AT DAVIS)

HOME ECONOMICS

- 1A-1B. Experimental Food Study. (3-3) Yr. Mrs. Jentsch
 6. Introduction to Textiles. (3) II. Miss Dryden
 (Formerly numbered 7.)
 7. Elementary Clothing Study. (3) I. Miss Dryden
 (Formerly numbered 5.)
 *10. Elementary Nutrition. (2) II. Mrs. Jentsch
 12. Euthenics. (2) I. _____
 *14. Consumer Problems. (2) I. Mrs. Patrick

Food Economics and Technology

- *100. Food Economics. (3) II. Mrs. Jentsch

Nutrition and Dietetics

- 112A-112B. Food and Dietetics. (3-3) Yr. Mrs. Jentsch
 (Formerly numbered 102A-102B.)

Child Development and Family Relationships

132. Child Psychology. (3) I. _____
 133. Laboratory in Child Development. (1) II. _____
 134. Child Care. (3) II. _____
 137. Marriage and Family Relationships. (3) II. _____

Family Economics

140. Home Management. (3) I. _____
 140L. Home Management Laboratory. (2) I and II. _____
 141. Consumers and the Market. (3) II. Mrs. Patrick
 *142. Social Problems of Families. (3) I. _____
 144. Family Finance. (3) II. Mrs. Patrick

Housing and House Furnishing

150. The House. (2) II. Mrs. Heineman, _____
 *152. Home Furnishing. (2) II. Mrs. Heineman
 (Formerly numbered 190.)

Clothing and Textiles

162. Clothing Economics. (3) I. Miss Dryden
 175. Clothing Design and Construction. (3) II. Miss Dryden
 (Formerly numbered 167.)

SPECIAL STUDY COURSES

198. Directed Group Study. (1-2) I and II. The Staff (_____ in charge)
 199. Special Study for Advanced Undergraduates. (1-5) Yr.
 The Staff (_____ in charge)

DECORATIVE ART

- 6A-6B. Theory of Design and Color. (2-2) Yr. Beginning either semester.
 Mrs. Heineman
 130A. Interior Design. (2) I. Mrs. Heineman

* Not to be given, 1951-1952.

ITALIAN

Michele De Filippis, Ph.D., *Professor of Italian (Chairman of the Department)*.

Rudolph Altrocchi, Ph.D., *Professor of Italian, Emeritus*.

Giovanni Cecchetti, Dottore in Lettere, *Instructor in Italian*.

*Josephine Pia Proskauer, Dottore in Lettere, *Associate in Italian*.



Hannibal S. Noce, Ph.D., *Lecturer in Italian*.

Letters and Science List.—All undergraduate courses in Italian are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

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.

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.

* Absent on leave, 1951-1952.

- 104A-104B. Italian Literature of the Nineteenth Century. (3-3) Yr.
Mr. Altrocchi
Reading of texts, with a special study of literary technique. Lectures in Italian.
105. Contemporary Italian Literature. (3) I. _____
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. Altrocchi
Prerequisite: 6 units of upper division work in Italian or the equivalent.
- *150A-150B. Dante's *Divine Comedy* in English Translation. (2-2) Yr.
Mr. Altrocchi
Designed for upper division students wishing the cultural background provided by such a masterpiece as Dante's, and for graduate students whose major field is not in Romance languages. Enrollment limited to students who have already completed some upper division work or who present other evidence of adequate preparation. No knowledge of Italian required. This course will not be accepted toward the major in Italian. Course 150A is prerequisite to 150B.
- 151A-151B. The Renaissance. (2-2) Yr. Mr. De Filippis
Emphasis on Italian literature and its ramifications in Europe. Lectures (in English) and reports on assigned subjects. No knowledge of Italian required.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
Reading course with a short thesis. Mr. De Filippis

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- 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. Altrocchi
The period (Trecento or Quattrocento, etc.) or the special genre to be studied will vary; the purpose of the course is training in methods of literary research.
229. Special Study for Graduates. (1-4) I and II. Mr. De Filippis

JOURNALISM

Robert W. Desmond, Ph.D., *Professor of Journalism (Chairman of the Department)*.

Philip F. Griffin, M.A., *Associate Professor of Journalism*.

Albert G. Pickerell, M.A., *Acting Assistant Professor of Journalism*.

Marvin Rosenberg, Ph.D., *Assistant Professor of Journalism*.



Charles L. Nicholson, *Lecturer in Journalism*.

Lloyd E. Reeve, *Lecturer in Journalism*.

* Not to be given, 1951-1952.

George W. Seidl, A.B., *Lecturer in Journalism.*

John H. Thompson, *Lecturer in Radio News Writing for the spring semester.*

Letters and Science List.—Courses 120A–120B, 140, 141, and 190 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Advisers: Mr. Desmond, Mr. Griffin, Mr. Pickerell, Mr. Rosenberg.

Preparation for the Major.—Required: History 4A–4B or History 17A–17B; Political Science 1 and 2; Economics 1A–1B; English 1A–1B or Speech 1A–1B.

The Major.—Required: Journalism 120A–120B, 140; 131 or 170; and any two of the following courses: Journalism 141, 150, 152A–152B, 171, 180, 190, 198, Business Administration 160 and 163.

In addition, all majors are required to select a concentration of 15 units or two concentrations of 9 and 6 units in any other field or fields of study offered by other departments of the University. These concentrations should be selected on the basis of the student's competence and special interest and must be approved by the department. All courses in the concentrations must be from upper division offerings.

The department reserves the right to restrict the student to not more than 24 units of work in courses offered in the Department of Journalism.

Continuance in the major is contingent upon the student achieving at least a 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.

UPPER DIVISION COURSES

- 120A–120B. The News. (4–4) Yr. Mr. Griffin and Mr. Seidl in charge
Two lectures per week and two two-hour laboratory sections.
Prerequisite: English 1A–1B or Speech 1A–1B.
A comparative study of representative newspapers and similar journals emphasizing professional and social problems of news presentation. The student will write critically from his observation of practices and experimentally in journalistic forms.
131. Editing the News. (4) I. Mr. Seidl, Mr. Pickerell
Two lectures per week and two two-hour laboratory sections.
Prerequisite: course 120A–120B.
A study of the problems of newspaper content, news selection, and display, with special attention to research into newspaper audience reactions. A research paper 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
Open to all upper division students, without prerequisite.
Study of the development of journalism, particularly in the United States, with an introduction to the important papers and personalities.
141. The Press and Society. (3) II. Mr. Desmond
Open to all upper division students, without prerequisite.
An examination of the press as an important institution in the nation and in the world.

150. Contemporary Editorial Problems. (3) II. Mr. Rosenberg
Prerequisite: courses 120A-120B, 131, or consent of the instructor.
An examination of current problems, with practice in bibliographical and research methods, and in writing in editorial and interpretive forms.
- 152A-152B. Magazine Writing and Production. (3-3) Yr. Mr. Reeve
Lectures, discussions, and individual conferences.
Class limited to twenty, with preference given to majors in journalism.
Instruction in preparation and marketing of articles for magazines, specialized publications, syndicates, and newspaper feature sections. Examination of problems of editing magazines.
170. Principles of Publishing. (3) I. Mr. Nicholson
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) I and 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. Thompson
Lectures, discussion, and writing experience.
Prerequisite: course 120A-120B. Class limited to eighteen, 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.
190. The Press and World Affairs. (3) I. Mr. Desmond
Open to all upper division students, without prerequisite.
Comparative world journalism, with an examination of sources of news from various capitals, and consideration of influences that affect information reaching the people about public affairs.
198. Directed Group Studies for Upper Division Students. (3) I and II. Mr. Rosenberg
Prerequisite: course 120A-120B, senior standing, and consent of the instructor.
Critical reviewing for the press. Theory and technique of reviewing current literature, drama, films, 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.

GRADUATE COURSES

Prerequisite: courses 120A-120B and 140. Admission to all graduate courses is at the discretion of the instructor. See also page 139.

Unless otherwise stated, the first half of any course (A) is not prerequisite to the second half (B).

- 201A-201B. Research Methods in Journalism. (2-2) Yr. Mr. Pickerell
A seminar offering review and practice in bibliographical method and journalistic research. (I) Sociological and qualitative studies; (II) Historical investigation. At least one semester of this course required for all candidates for the Master of Journalism degree.
220. The Newspaper and Public Affairs. (3) I and II. Mr. Seidl, 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) II. Mr. Griffin
A seminar in the development and performance of the newspaper press, with special reference to audience problems. With reports from students.
263. Mass Communications and the Opinion-Forming Process. (3) I. Mr. Desmond
A seminar involving examination of the place of the press, radio and films in shaping the public mind. Theories of public opinion; propaganda techniques of governments, political parties, pressure groups, and other organized bodies. With reports from students.
265. The Law of Communications. (3) II. Mr. Pickerell
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. Nicholson
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.
- 280A-280B. Seminar in Public Communications. (2-2) Yr. Mr. Pickerell, Mr. Desmond
Investigation of comparative practices in the foreign and domestic press and radio.
299. Special Research Projects and Field Study in Communications. (1-4) I and II. The Staff (Mr. Desmond in charge)
Individual investigation of a selected topic, conducted under guidance of a member of faculty. May be taken both semesters.

LAW

- Barbara Nachtrieb Armstrong, A.B., J.D., Ph.D., LL.D., *Professor of Law.*
Edward L. Barrett, Jr., B.S., LL.B., *Professor of Law.*
* Albert A. Ehrenzweig, Dr. Jur., J.D., LL.M., *Professor of Law.*
Judson F. Falknor, B.S., LL.B., *Professor of Law.*
William Warren Ferrier, Jr., A.B., J.D., *Professor of Law.*
Richard W. Jennings, A.B., M.A., LL.B., *Professor of Law.*
William T. Laube, Jr., A.B., J.D., LL.M., *Professor of Law.*
James Patterson McBaine, LL.B., LL.D., *A. F. and May T. Morrison Professor of Municipal Law.*
Frank C. Newman, A.B., LL.B., LL.M., *Professor of Law.*
Covey T. Oliver, A.B., LL.B., *Professor of Law.*
Warren Olney, III, A.B., J.D., *Professor of Law and Criminology.*
William Lloyd Prosser, A.B., LL.B., LL.D., *Elizabeth Josselyn Boalt Professor of Law (Chairman of the Department).*
Henry W. Ballantine, A.B., LL.B., LL.D., *John H. Boalt Professor of Law, Emeritus.*
Alexander M. Kidd, A.B., LL.B., *Elizabeth Josselyn Boalt Professor of Law, Emeritus.*
Warren E. Eastland, LL.B., *Associate in Law.*
Sho Sato, LL.B., *Associate in Law.*



William N. Keeler, A.B., J.D., *Lecturer in Law.*

* In residence fall semester only, 1951-1952.

Maurice Moonitz, Ph.D., C.P.A., *Associate Professor of Business Administration and Lecturer in Law.*

Ralph Smith Rice, B.S., LL.B., LL.M., *Emanuel S. Heller Visiting Professor of Law for the spring semester.*

Vernon M. Smith, A.B., LL.B., *Librarian of the Law Library and Lecturer in Law.*

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.

Nonresidents of California enrolled as students in the School of Law pay a fee of \$185 each semester, which includes the incidental fee charged all students.

PROFESSIONAL CURRICULUM

First Year

200A-200B. Contracts. (3-3) Yr.	Mr. Laube
202. Crimes. (3) II.	Mr. Olney
204. Introduction to Law. (1) I.	Mr. Falknor
206A-206B. Procedure: First Course. (2-3) Yr.	Mr. McBaine
208A-208B. Property. (3-3) Yr.	Mr. Ferrier
210. Equity. (3) I.	Mr. Newman
212A-212B. Torts. (3-3) Yr.	Mr. Prosser

Second Year

220. Administrative Law: First Course. (3) II.	Mr. Newman
222A-222B. Business Associations. (3-3) Yr.	Mr. Jennings
224A-224B. Constitutional Law. (2-2) Yr.	Mr. Barrett
226A-226B. Wills and Future Interests. (2-2) Yr.	Mr. Ferrier
228. Legal Accounting. (2) I.	Mr. Moonitz
230. Marital Property. (2) I.	Mrs. Armstrong
236. Trusts. (2) I.	Mr. Oliver
237. Income Taxation. (3) II.	Mr. Rice

Third Year

240. Administrative Law: Second Course. (2) I.	Mr. Newman
*242. Admiralty. (2) I.	—
243. Commercial Transactions. (3) I.	Mr. Falknor
244A-244B. Creditors' Rights. (2-2) Yr.	Mr. Laube
245. Comparative Jurisprudence. (2) I.	Mr. Ehrenzweig
246. Conflict of Laws. (3) I.	Mr. Ehrenzweig
247. Corporation Finance. (2) II.	Mr. Jennings
248. Selected Problems in Corporations and Partnerships. (2) I.	Mr. Jennings

* Not to be given, 1951-1952.

- 250A-250B. Evidence. (2-2) Yr. Mr. McBaine
- *251. Selected Problems in Comparative Jurisprudence. (2) II.
Mr. Ehrenzweig
253. Family Law. (2) II. Mrs. Armstrong
254. Federal Jurisdiction. (2) I. Mr. Barrett
257. Insurance. (2) II. Mr. Falknor
258. International Law. (2) II. Mr. Oliver
262. Labor Law: First Course. (2) II. Mrs. Armstrong
- *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
267. Modern Pleading. (2) II. Mr. Falknor
- *268. Municipal Corporations. (2) II. _____
270. Government Regulation of Business. (2) I. _____
274. Restitution. (2) II. Mr. Rice
276. Restraint of Trade and Unfair Competition. (3) II. Mr. Barrett
278. Selected Problems in Criminal Law and Administration. (2) I.
Mr. Olney
282. Estate, Inheritance, and Gift Taxation. (2) I. Mr. Oliver
284. Selected Problems in Taxation. (2) II. Mr. Oliver

Graduate Curriculum

- 287A-287B. Seminar in Administrative Law and Procedure. (2-2) Yr.
Mr. Newman
- 288A-288B. Seminar in Business Organizations. (2-2) Yr. Mr. Jennings
- 289A-289B. Seminar in Commercial Transactions. (2-2) Yr.
Mr. Laube, Mr. Prosser
- 290A-290B. Seminar in Constitutional Law. (2-2) Yr. Mr. Barrett
- 291A-291B. Seminar in Criminal Law and Procedure. (2-2) Yr. Mr. Olney
- 292A-292B. Seminar in International and Maritime Law. (2-2) Yr.
Mr. Oliver
- 293A-293B. Seminar in Labor Law and Procedure. (2-2) Yr.
Mrs. Armstrong, Mr. Newman
- 294A-294B. Seminar in Legal History and Jurisprudence. (2-2) Yr.
Mr. Ehrenzweig
- 295A-295B. Seminar in Legislation and Legislative Procedure. (2-2) Yr.
Mr. Newman, Mr. Smith

* Not to be given, 1951-1952.

- 296A-296B. Seminar in Practice and Procedure. (2-2) Yr.
Mr. Falknor, Mr. McBaine
- 297A-297B. Seminar in Property and Trust Administration. (2-2) Yr.
Mr. Ferrier, Mr. Oliver
- 298A-298B. Seminar in Public Finance and Taxation. (2-2) Yr. Mr. Oliver
- 299A-299B. Seminar in Roman and Comparative Law. (2-2) Yr.
Mr. Ehrenzweig

LIBRARIANSHIP

Donald Coney, M.A., *Professor of Librarianship.*

J. Periam Danton, Ph.D., *Professor of Librarianship (Chairman of the Department).*

LeRoy C. Merritt, Ph.D., *Professor of Librarianship.*

Edith M. Coulter, M.A., B.L.S., *Professor of Librarianship, Emeritus.*

Sydney B. Mitchell, M.A., *Professor of Librarianship, Emeritus.*

Della J. Sisler, M.A., B.L.S., *Associate Professor of Librarianship, Emeritus.*

Anne Ethelyn Markley, M.A., *Associate Professor of Librarianship.*

Reuben Peiss, M.A., *Associate Professor of Librarianship.*

Fredric John Mosher, Ph.D., *Instructor in Librarianship.*



Jessie E. Boyd, M.A., Cert. in Libr., *Lecturer in School Library Administration for the spring semester.*

Leone Garvey, M.A., *Lecturer in Librarianship for the spring semester.*

The School of Librarianship is organized to offer a two-year curriculum. On completion of the first year with an average grade of at least C plus (1.5 grade-point average) the Bachelor of Library Science (B.L.S.) degree is awarded. The degree of Master of Library Science is granted to students who complete with an average grade of at least B the second-year curriculum. Candidates for this degree are subject to all general University regulations governing it (see ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION).

Applicants for admission to either curriculum should send to the Dean of the School transcripts of their academic records in order that their qualifications for admission to the School may be determined. 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 Profile and Aptitude Tests of the Graduate Record Examination and should do so, if possible, not later than the spring of the year of application.

Applications from those who obtain less than a 1.5 grade-point average in their last two years of college or university work cannot be considered.

Applications from those over thirty-five years of age will be considered only when the applicants hold responsible library positions from which they can obtain leaves of absence. Exceptions to this rule may be considered only under unusual circumstances, such as applicants having a doctor's degree.

State Credential for School Librarians.—The California State Department of Education accepts the completion of the first year's work in satisfaction of its technical requirements for the special credential in librarianship, but candidates for it must also do directed practice work in school libraries during the second semester. To meet additional requirements of the State Department of Education for this credential, candidates should take the following courses before enrollment in the School, or after the completion of the first year's work: secondary education, educational psychology, and junior high school education, elementary education, or reading and literature in the elementary school (totaling at least 9 units).

PROFESSIONAL COURSES

In 1951-1952, courses in librarianship will be offered only in the fall and spring semesters. Students may begin the first-year curriculum only at the opening of the fall semester and complete it in the spring semester. The second-year curriculum may be commenced in either the fall or spring semesters, and electives may be taken in summer sessions or in any semester.

First-Year Curriculum

The 24-unit program of each student must include the following basic courses: 201, 202, 203, 204; the remaining units are to be elected from other courses in the first-year curriculum and may include 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 subject cataloguing based on Sears, and Library of Congress lists of subject headings. Emphasis is placed upon acquiring familiarity with literature and tools of cataloguing.
202. Bibliography and Reference Materials. (3) I. Mr. Mosher
Lectures, discussions, and reports on assigned problems.
Basic reference materials including national and subject bibliography.

203. Introduction to Librarianship. (3) I. Mr. Danton, Mr. Mosher
Orientation of the new student in the profession of librarianship. Introductory survey of the evolution of modern libraries and basic information about the principal fields of library service, with emphasis on major trends and problems. Readings and written reports.
204. Communication: History, Institutions, Media. (2) I. Mr. Merritt, Mr. Peiss
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, Mr. Peiss
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. ———
Government, organization, and administration of municipal, county, and regional public libraries. Library service programs in relation to varying community patterns. Lectures, readings, reports, field trips.
208. College and University Library Administration. (2) II. Mr. Danton
A general introduction to the organization and administration of college and university libraries and their place in the institutions of which they are a part. Problems and practices with respect to the library's government, functions, staff, collections, finances, and building are considered by means of written assignments, readings, and class discussion.
209. Library Work with Children. (2) II. Miss Garvey
Lectures and discussion.
A general survey of children's books and reading preferences. Historical backgrounds and development; types of children's literature; levels of interest; criticism and evaluation; illustration; trends; book selection; storytelling; organization and administration of a children's room in a public library.
210. Special Library Administration. (2) II. Mr. Peiss
Administration of special libraries in business, industry, and government. Special emphasis on departmental libraries in public and university libraries. Theory of selecting, acquiring, and using special library materials.
211. Development of the Book. (2) II. Mr. Mosher
Prerequisite: consent of the 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
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. Miss Markley
Prerequisite: course 201 or equivalent.
Cataloguing and classification of library materials requiring special description and analysis; practice in the use of Library of Congress classification and subject headings; arrangement of the catalogue; administration of the cataloguing department.
215. Reading and Reading Interests. (2) II. Mr. Merritt
Reading interests, habits, and needs of different types and groups of readers. The nature of reading; problems of reading; selection of reading by children, college students, and public library patrons. The role of the library in adult education.

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 and must have completed with a grade of at least B the first-year curriculum in a graduate—Type I or II—library school, accredited by the American Library Association and approved by the University of California. Professional library experience before undertaking advanced work is recommended.

Candidates for the master's degree must take 24 units of upper division and graduate courses. Twelve of these must be selected from the second-year curriculum of the School of Librarianship. The remaining 12 units may be selected from this same curriculum or from second-semester first-year courses not previously taken, or from upper division or graduate courses in subjects related to the particular interest of the student. In every case the program is subject to the approval of the Dean. Comprehensive final examinations and completion of a special study course are required of every candidate. An average grade of at least B must be maintained during the period in which the work for the master's degree is taken. Students must complete their work for the degree within five years from the date of first enrollment.

Any course in the second-year curriculum is open to any graduate student who satisfies the instructor of his ability and preparation to undertake the work, even though he is not a candidate for a master's degree in this school and cannot qualify for it.

218. Advanced Cataloguing. (2) II. Mr. Peiss
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. Mr. Peiss
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. Peiss
Prerequisite: courses 205, 208.
Problems connected with the acquisition, development, and maintenance of the book, periodical, and other collections of university libraries. Required of all master's degree candidates who intend to specialize in the college and university library field.
225. *History of Libraries.* (2) II. Mr. Peiss
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) II. 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. Merritt
The basic advanced course in the principles and practice of library administration. Analysis of the organization and management of modern libraries of various types. Prerequisite to courses 232, 233, 234.
232. *University Library Administration.* (2) II. Mr. Coney
Prerequisite: courses 208, 230.
Study of current issues in personnel, finance, service, and the organization of materials and work. Individual projects, work periods, consultation, reports, and class discussion. Required of all master's degree candidates who intend to specialize in the college and university library field.
233. *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. _____
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.
238. *Library in the Community.* (2) I. _____
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. _____
Problems in methods of determining maturity level, social and moral attitudes, and other educational and propagandistic assumptions in books, magazines, and other library materials.

251. Methods of Research in Librarianship. (2) I. Mr. Merritt, Mr. Mosher
 History and function of research in contemporary society. Values and
 meaning of research. Techniques of bibliographical, historical, and socio-
 logical research, and their implications for the definition and investigation
 of library problems. Required of all candidates for the master's degree.
299. Special Study. (4-8) I and II.
 Mr. Danton (in charge), Mr. Coney, Miss Markley,
 Mr. Merritt, Mr. Mosher, Mr. Peiss
 Individual direction of student's choice, planning and writing of mas-
 ter's essay. May be elected either semester.

LINGUISTICS

Group in Linguistics:

- Peter A. Boodberg, Ph.D., *Professor of Oriental Languages.*
 Arthur G. Brodeur, Ph.D., *Professor of English and Germanic Philology.*
 Francis J. Carmody, Ph.D., *Professor of French.*
 Yuen Ren Chao, Ph.D., Litt.D., *Professor of Oriental Languages and Lin-
 guistics.*
 C. Douglas Chrétien, Ph.D., *Professor of Speech and Lecturer in Linguistics.*
 Murray B. Emeneau, Ph.D., *Professor of Sanskrit and General Linguistics*
(Chairman of the Group in Linguistics).
 †Robert K. Spaulding, Ph.D., *Professor of Spanish.*
 Arthur E. Hutson, Ph.D., *Associate Professor of English.*
 Yakov Malkiel, Ph.D., *Associate Professor of Romance Philology.*
 Oleg A. Maslenikov, Ph.D., *Associate Professor of Slavic Languages.*
 Madison S. Beeler, Ph.D., *Assistant Professor of German.*
 Mary R. Haas, Ph.D., *Assistant Professor of Siamese and Linguistics.*

Instruction in linguistics is not organized as a single administrative unit in the University, but the relevant courses are offered by a number of departments. The degrees of Master of Arts and Doctor of Philosophy will be conferred upon qualified graduate students who complete the requirements. Prospective candidates for these degrees should consult the Chairman of the Group in Linguistics.

Courses in specific languages are offered by the departments of Classics (Greek, Latin, Sanskrit), English (Old and Middle English, Celtic), French, German (including Old and Middle High German, Gothic, Old Saxon, Old Icelandic), Italian, Near Eastern Languages (Hebrew, Arabic, Syriac, Assyrian, Sumerian, Egyptian, Coptic), Oriental Languages (Chinese, Japanese, Malay and Malayo-Polynesian, Mongolian, Tibetan, Siamese), Romance Philology (Late Latin, Provençal), Scandinavian Languages and Literature (Swedish, Norwegian, Danish), Slavic Languages (Russian, Polish, Serbo-Croatian, Czech, Old Church Slavic, Early Russian), and Spanish and Portuguese.

In addition, attention is invited to the following more general courses:

- Language and Culture (Anthropology 120, Mr. Rowe).
 Introduction to General Linguistics (Classics 193, Mr. Chrétien).
 Linguistic Analysis (Classics 195, Mr. Emeneau).
 Introduction to Indo-European Comparative Grammar (Classics 196, Mr. Emeneau).
 Language (English 25, Mr. Reed).
 Phonetics and Phonemics (Oriental Languages 167, Miss Haas).

† Sabbatical leave, fall semester, 1951-1952.

- Types of Linguistic Structure (Oriental Languages 177, Miss Haas).
 American Indian Languages (Oriental Languages 178, Miss Haas).
 Linguistics Laboratory (Oriental Languages 197A-197B, Miss Haas).
 Seminar in Descriptive Linguistics (Oriental Languages 207A-207B, Miss Haas).
 Seminar in Historical Linguistics (Oriental Languages 227A-227B, Miss Haas).
 Linguistic History of the Roman Empire (Romance Philology 200, Mr. Malkiel).
 Late Latin Language and Literature (Romance Philology 201, Mr. Malkiel).
 General Romance Linguistics (Romance Philology 202, Mr. Malkiel).
 Comparative Romance Phonetics (Romance Philology 204, Mr. Carmody).
 General Phonetics (Speech 103, Mr. Chrétien).

MATHEMATICS

- Thomas Buck, Ph.D., *Professor of Mathematics*.
 Griffith C. Evans, Ph.D., *Professor of Mathematics*.
 Alfred L. Foster, Ph.D., *Professor of Mathematics*.
 Derrick H. Lehmer, Ph.D., *Professor of Mathematics*.
 Michel Loève, Docteur ès Sciences, *Professor of Mathematics*.
 Sophia Levy McDonald, Ph.D., *Professor of Mathematics*.
 Charles B. Morrey, Jr., Ph.D., *Professor of Mathematics (Chairman of the Department)*.
 Anthony P. Morse, Ph.D., *Professor of Mathematics*.
 Jerzy Neyman, Ph.D., *Professor of Mathematics and Director of the Statistical Laboratory*.
 Raphael M. Robinson, Ph.D., *Professor of Mathematics*.
 Alfred Tarski, Ph.D., *Professor of Mathematics*.
 Benjamin A. Bernstein, Ph.D., *Professor of Mathematics, Emeritus*.
 John H. McDonald, Ph.D., *Professor of Mathematics, Emeritus*.
 Charles A. Noble, Ph.D., *Professor of Mathematics, Emeritus*.
 Arthur R. Williams, Ph.D., *Assistant Professor of Mathematics, Emeritus*.
 *Erich L. Lehmann, Ph.D., *Associate Professor of Mathematics*.
 Raymond H. Seiobereti, Ph.D., *Associate Professor of Mathematics*.
 Frantisek Wolf, Ph.D., *Associate Professor of Mathematics*.
 Edward W. Barankin, Ph.D., *Assistant Professor of Mathematics*.
 Stephen P. Diliberto, Ph.D., *Assistant Professor of Mathematics*.
 Evelyn A. Fix, Ph.D., *Assistant Professor of Mathematics*.
 *Joseph L. Hodges, Jr., Ph.D., *Assistant Professor of Mathematics*.
 Edmund Pinney, Ph.D., *Assistant Professor of Mathematics*.
 Elizabeth L. Scott, Ph.D., *Assistant Professor of Mathematics*.
 Abraham Seidenberg, Ph.D., *Assistant Professor of Mathematics*.
 Lee H. Swinford, Ph.D., *Assistant Professor of Mathematics*.
 William G. Badé, Ph.D., *Instructor in Mathematics*.
 Paul L. Chambré, Ph.D., *Instructor in Mathematics*.
 Harry M. Hughes, Ph.D., *Instructor in Mathematics*.
 Terry A. Jeeves, A.B., *Instructor in Mathematics*.
 Ralph M. Lakness, Ph.D., *Instructor in Mathematics*.



Fred C. Andrews, M.S., *Lecturer in Mathematics*.

* Absent on leave, 1951-1952.

- Woodrow W. Bledsoe, B.S., *Lecturer in Mathematics.*
 Jan Kalicki, Ph.D., *Visiting Assistant Professor of Mathematics.*
 James M. G. Fell, Ph.D., *Lecturer in Mathematics.*
 Gopinath Kallianpur, Ph.D., *Lecturer in Mathematics.*
 Hewitt Kenyon, B.S., *Lecturer in Mathematics.*
 George M. Kuznets, Ph.D., *Associate Professor of Agricultural Economics.*
 Lucien M. LeCam, Licencié es Sciences, *Lecturer in Mathematics.*
 Abram V. Martin, Ph.D., *Visiting Assistant Professor of Mathematics.*
 Benson Mates, Ph.D., *Assistant Professor of Philosophy.*
 Ting-kwan Pan, Ph.D., *Visiting Assistant Professor of Mathematics.*
 Warren B. Stenberg, A.B., *Lecturer in Mathematics.*
 Richard G. Stoneham, M.S., *Lecturer in Mathematics.*
 Robert F. Tate, M.A., *Lecturer in Mathematics.*
 Joseph W. Weihe, M.S., *Lecturer in Mathematics.*

Letters and Science List.—All undergraduate courses in mathematics except courses 107, 142A, 142B, 142C, 142D, 144 are included in the Letters and Science List of Course. For regulations governing this list, see page 69.

Departmental Major Advisers: Mr. Foster; Miss Scott (*Statistics*).

THE MAJOR IN MATHEMATICS

Preparation for the Major in Mathematics.—*Adviser:* Mr. Pinney.

Before taking the upper division courses for the major, the student should have a basis of knowledge equivalent to courses C, G, 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 competence in algebra, analysis, and geometry. The courses designed for this purpose are 111A-111B, 112A-112B, 119A-119B, in each of which at least 3 units should be taken.

The attention of the student is directed to the possibility of making group majors with other departments. Such majors will be welcomed not only with the departments of the physical sciences, but also with some of the social sciences and philosophy. In particular, the attention of those who are interested in logic is directed to Philosophy 12A-12B, as well as to Mathematics 109A-109B.

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 and 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 at least 9 units in courses 113, 120A,

120B, 132, 165A, and 165B. 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.

Subject to the requirement of competence in the above majors, and with the approval of the adviser, the student is at liberty to take theoretical courses in physics, astronomy, or other sciences as part of his major in mathematics or mathematical statistics, as well as other upper division courses in mathematics. Course 201A-201B forms a desirable part of the program for senior students with facility for mathematics. Courses listed under Statistics may of course be used as part of the mathematics major. Special attention is directed also to the course in analytic mechanics, Physics 105A-105B. Students preparing for the Civil Service Examination in statistics should take course 132.

Colleges of Engineering and Chemistry.—The minimum requirements for admission to the freshman course (3A-3B, or 3) are two years of high school algebra or Mathematics D, plane geometry, and plane trigonometry. Prospective engineering students are urged, however, to add a half-year of solid geometry to this minimum preparation.

School of Business Administration.—Course 2, mathematics of finance and business, is a prerequisite for students in the School of Business Administration. As an alternative, however, course 11A-11B or 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. Pinney and the Staff
Prerequisite: plane geometry; one and one-half years of high school algebra or course D.
Course C includes plane trigonometry and spherical right triangles.
- D. Intermediate Algebra. (3) I and II. Mr. Bledsoe 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. ——— and the Staff
1. College Algebra. (3) I and II. Mr. Kenyon and the Staff
Review and practice in general ideas and applications of algebra and trigonometry. Methods of proof and scientific procedure as exemplified in these subjects.
Open only to students who have had the prerequisite for course 3A, who have taken the qualifying examination for that course, and who are then permitted by the Department to enroll in that course. Students who show little or no knowledge of algebra will not be allowed to enroll.
2. Mathematics of Finance and Business. (3) I and II. Mr. Martin 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. Weihe 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 1 in regular session at Berkeley, the semester prior to registering in 3A, must take the qualifying examination which is given on the first day of registration week of each regular session. Students who do not pass this examination will be required to pass course 1 before taking course 3A.

Elements of differential calculus and analytic geometry.

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

Prerequisite: course 3A or course 11A-11B. Mr. Pan and the Staff
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. Badé and the Staff
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. Lakness 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.

Prerequisite: course 3B. Mr. Badé and the Staff
Continuation of 3B. Thorough technique of differential and integral calculus.

4G. Analytic Geometry and Calculus, Third Course. (3) I and II.

Mr. Kenyon, Mr. Pan
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. Lakness 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.

Mr. Stenberg
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. Kalicki, Mr. Stenberg

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. Seidenberg
Prerequisite: course G or high school solid geometry, and course 8 or its equivalent.
Projective theory of one-dimensional forms, point and line conics. Mainly by the synthetic method.
10. Spherical Trigonometry. (2) I and II. Mr. Sciobereti
Prerequisite: one and one-half years of high school algebra, or course D, and plane trigonometry. Not open to students who have credit in Astronomy 8.
- 11A-11B. Analytic Geometry and Calculus. (3-3) Yr. Mr. Swinford
Prerequisite: one and one-half years of high school algebra or course D; plane geometry; plane trigonometry.
The elements of analytic geometry and of differential and integral calculus. Completion of this year course will satisfy the prerequisite requirement for course 3B.
Credit for each part of this course will be limited to two units for a student who already has the prerequisites for course 3A.
12. Elements of Probability and Statistics. (3) I and II. (See Statistics, below.)
- 14A-14B. Calculus and Advanced Calculus. (5-5) Yr. Mr. Fell
Prerequisite: course 3B.
Covers approximately the subject matter of courses 4A-4B, 110A-110B.
- 16A-16B. Analytic Geometry and Calculus. (3-3) Yr.
Prerequisite: same as for 3A. Mr. Swinford and the Staff
A year course in analytic geometry and differential and integral calculus.
- Logic. (Philosophy 12A-12B). (3-3) Yr.

UPPER DIVISION COURSES

- 101A-101B. Elementary Mathematics for Advanced Students. (3-3) Yr.
Mrs. McDonald, Mr. Swinford
101A: Mr. Swinford; 101B: Mrs. McDonald.
Prerequisite: courses 4A-4B, 8, 9. Course 101A is not prerequisite to 101B.
Selected topics in algebra and geometry, with particular emphasis on historical development.
Designed for students who are preparing to teach mathematics in secondary schools.
107. Mathematics in Secondary Schools. (2) I. Mrs. McDonald
Enhancing content through applications; 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. Mr. Mates
Prerequisite: Philosophy 12B and course 3B or 8; prerequisites may be altered with consent of the instructor.
Elementary mathematical logic: sentential connectives, quantifiers, identity. Applications to the formalization of mathematical theories.

Elements of set theory: axiomatic foundations; operations on sets; relations, functions; set-theoretical equivalence; ordering and well ordering; cardinal and ordinal arithmetic.

110A-110B. Advanced Engineering Mathematics. (2-2) Yr. Beginning each semester. Mr. Diliberto, Mrs. McDonald, Mr. Pinney, Mr. Sciobereti

Prerequisite: course 4A-4B. Primarily for students in engineering.
Conjugate functions, hyperbolic functions, Fourier series, differential equations.

110. Advanced Engineering Mathematics. Double Course. (4) II. The Staff
Prerequisite: same as for 110A-110B.

111A. Algebra. (3) I and II. Mr. Bledsoe, Mr. Foster
Prerequisite: courses 4A-4B, 8.
Linear dependence, matrices, invariants, quadratic forms.

111B. Algebra. (3) I and II. Mr. Barankin
Prerequisite: course 111A.
Groups, theory of equations, introduction to Galois theory.

112A. Projective Geometry. (3) II. _____
Prerequisite: courses 4A-4B, 9, 111A.
Projective coordinates. Loci of the second order. Higher plane curves.

112B. Metric Differential Geometry. (3) I and II. Mr. Pan
Prerequisite: course 4A-4B. Course 112A is not prerequisite to 112B.
Vector analysis. Study of curves and surfaces in three dimensions.

113. Second Course in Probability and Statistics. (3) I and II. (See Statistics, below.)

115A-115B. The Theory of Numbers. (3-3) Yr. Mr. Robinson
Prerequisite: course 8.
Divisibility, congruences, number systems.

*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.

*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. Foster, Mr. Kalicki, Mr. Martin, Mr. Morse, Mr. Wolf
Prerequisite: course 4A-4B, with honor grades; or 14A-14B; or 4A-4B and 110A-110B; or consent of the instructor.
Differential equations and analysis. Numerical solutions of differential equations, general properties and special types of differential equations; Bessel functions and Legendre polynomials.

120A-120B. Theory of Probability and Statistics. (3-3) Yr. (See Statistics, below.)

* Not to be given, 1951-1952.

- †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. _____
Course 127A is not prerequisite to 127B.
Mathematical development of logic, and the logic of algebra and geometry.
- *128. *Numerical Analysis.* (3) II. Mr. Lehmer
Prerequisite: course 110A or 119A.
The practical aspects of computational methods for problems in applied mathematics. Finite difference methods and their applications to numerical integration, solution of equations, and numerical integration of ordinary and partial differential equations. Methods for large-scale computing systems.
- 142A-142B. *Life Contingencies.* (3-3) Yr. (See Statistics, below.)
- 142C-142D. *Laboratory Course in Life Contingencies.* (1-1) Yr. (See Statistics, below.)
- *144. *Population Statistics.* (3) II. (See Statistics, below.)
- 150A-150B. *Theory of Functions, First Course.* (3-3) Yr. Mr. Badé
Prerequisite: course 4B.
Thorough critical development of analysis: limit theorems, Jacobians, measure, generalizations of integral, complex, and real variables.
Designed primarily for students who will work for higher degrees in mathematics and statistics. It may be followed by course 165A or course 201B.
- 165A-165B. *Probability Theory and Its Analytic Basis.* (3-3) Yr. (See Statistics, below.)
- 165C-165D. *Laboratory Course in Probability Theory and Its Analytic Basis.* (1-1) Yr. (See Statistics, below.)
185. *Special Topics in Real and Complex Variables.* (3) II. _____
Prerequisite: course 150A-150B.
Lebesgue-Stieltjes integral, analytic functions, orthogonal expansions.
199. *Special Study for Advanced Undergraduates.* (1-5) I and II.
Mr. Pinney in charge
Investigation of special problems under the direction of members of the department. In particular, this course offers an opportunity to students with facility for mathematics to anticipate some of the advanced courses by individual study.

TEACHERS' COURSE

- *307. *Coördination of Teaching of Mathematics.* (2) I and II.
Group discussion. Mrs. McDonald

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- 201A-201B. *Function Theory.* (3-3) Yr. Mr. Evans
Prerequisite: courses 111A, 119A-119B.
Point sets in Euclidean space, measure, generalizations of integral in-

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

* Not to be given, 1951-1952.

cluding 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. Robinson
The theory of analytic functions and topics such as meromorphic functions, entire functions, modular functions, and Abelian integrals, analytic theory of differential equations, inequalities, etc., at the pleasure of the instructor.
- 210A-210B. Theory of Functions of a Real Variable. (3-3) Yr. Mr. Morse
Prerequisite: course 201A-201B.
Measure theory, metric spaces, topics such as functional analysis, calculus of variations, partial differential equations, potential theory, transfinite processes, expansions, according to the pleasure of the instructor.
- 215A-215B. Topology. (3-3) Yr. Mr. Martin
Convergence, compactness, completeness, function space topologies and metrization. Connectedness, local connectedness, the fundamental group, homology theories, duality and fixed point theorems.
- 220A-220B. Differential Equations. (3-3) Yr. Mr. Buck
General theories, topics in ordinary and partial differential equations, boundary value problems. This course presupposes some knowledge of complex and real variable theory.
- 225A-225B. Metamathematics. (3-3) Yr. Mr. Tarski
Prerequisite: courses 109A-109B, 111A-111B.
Formalized mathematical theories. Symbols, concatenation, formulas, sentences, derivability, axiomatic basis. Consistency and completeness. Notions of model and consequence—their relations to consistency and derivability. Application to formalized number theory. Truth and 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: course 109A-109B.
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. Mr. Diliberto
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 and 111A-111B.
Algebra of sets and relations; groups, rings, fields; applications of general algebraic notions (isomorphism, homomorphism, subalgebras, direct products).

* Not to be given, 1951-1952.

250A-250B. Algebra. (3-3) Yr.

Mr. Seidenberg

Prerequisite: course 111A-111B.

The basic tools of commutative algebra: theory of fields; algebraic and transcendental extensions; Galois theory; valuations; ideal theory.

265A-265B. Advanced Probability. (3-3) Yr. (See Statistics, below.)

270. Technical Hydrodynamics. (3) II.

Theoretical analyses of motion of frictionless and viscous fluids, flow of compressible fluids at sub- and supersonic velocities.

290. Seminars. (2-6) I and II.

The Staff (Mr. Evans in charge)

Topics in foundations of mathematics, theory of numbers, numerical calculation, analysis, geometry, algebra, probability and theory of statistics, and in their applications, by means of lectures and informal conferences; work based largely on original memoirs. During 1951-1952 there will be, in particular, lecture seminars on the following subjects, in charge of the persons indicated:

(a) Selected Topics in Algebra, I, II, Mr. Foster; (b) Multiple Integrals in the Calculus of Variations, I, II, Mr. Morrey; (c) Operators and Mathematics in Quantum Mechanics, I, II, Mr. Wolf; (g) Calculus of Variations, I, II, Mr. Evans.

295. Individual Research Leading to Higher Degrees. (2-6) I and II.

The Staff (Mr. Evans 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 COURSE

12. Elements of Probability and Statistics. (3) I and II.

Mr. Barankin, Miss Fix, Miss Scott

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 frequency. Discrete probability. Testing statistical hypotheses. Illustrations from genetics, bacteriology, industrial sampling and public health.

UPPER DIVISION COURSES

113. Second Course in Probability and Statistics. (3) I and II. Miss Scott

Prerequisite: courses 3A-3B or 11A-11B, and course 12.

Continuation of course 12. Expectation, variance, correlation, regression. Mathematical law of large numbers. Simple examples of least squares estimates. Basic ideas of confidence intervals. Applications.

120A-120B. Theory of Probability and Statistics. (3-3) Yr. Mr. Jeeves

Prerequisite: courses 4A-4B, 150A-150B (may be taken concurrently), and 113. It is recommended that 120C-120C be taken concurrently.

Continuation of course 113. Markoff theorem. Theorem of Laplace. Order statistics. Lambda criterion and maximum likelihood estimates. Continuous probability laws. Analysis of variance. Applications.

120C-120D. Laboratory Course in Theory of Probability and Statistics. (1-1)

Yr. Mr. Jeeves in charge

May be taken in conjunction with course 120A-120B. Course 120C is not prerequisite to 120D.

*128. Numerical Analysis. (3) II. (See Mathematics, above.)

130A-130B. Statistical Inference. (3-3) Yr. Miss Fix
Prerequisite: course 3A-3B or 11A-11B. It is recommended that 130C-130D be taken concurrently.

Not open for credit to students who have completed courses 12 and 113. Not more than one of the courses 130A, 130E 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.

Miss Fix 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. Hughes

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 may be taken for credit.

Prerequisite: course 4A-4B or consent of the instructor.

Essential elements of course 130A-130B with all of the applications and illustrations chosen from the field of engineering.

132. Descriptive Statistics. (3) II. _____

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. _____

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. _____

May be taken in conjunction with course 142A-142B.

*144. Population Statistics. (3) II. _____

Prerequisite: courses 12 and 3A, or 130A.

Collection of data. Intercensal and postcensal populations. Formulas for mortality tables. Incompleteness of population data. Incompleteness of birth and death registrations. Infantile death rates. Errors in age. Construction of mortality tables.

165A-165B. Probability Theory and Its Analytic Basis. (3-3) Yr.

Mr. Loève
Prerequisite: course 150A-150B. It is recommended that 165C-165D be taken concurrently.

Lebesgue-Stieltjes integral. Axiomatic foundations of probability. Conditional probability and expectation. Fourier transform. Central limit theorem.

* Not to be given, 1951-1952.

165C-165D. Laboratory Course in Probability Theory and Its Analytic Basis. (1-1) Yr. Mr. Kallianpur

Prerequisite: course 150A-150B.

Illustrative examples in probability theory and applications to probability problems in various fields such as statistical physics.

GRADUATE COURSES

Courses 261, 263, 264, and 266 are intended to introduce the student to practical work in various fields of application. In addition to the two hours of supervised practical work connected with these courses the students attending them will be able to use the laboratory at other times as well.

Students who are doing research problems in experimental sciences may register in courses 261, 263, 264, and 266 without the specified prerequisite, with the consent of the instructor.

The laboratory will be open to graduate students for research.

260A-260B. Advanced Topics in Probability and Statistics. (3-3) Yr.

Mr. Neyman

Prerequisite: courses 111A, 120A-120B, and 150A-150B or 201A-201B, 185. Course 165A 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. Introduction 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, Mr. LeCam

May be taken in conjunction with course 260A-260B. Course 260C is not prerequisite to 260D.

261. Statistical Problems in Experimentation. (3) I. Miss Scott

Lectures and laboratory.

Prerequisite: course 130A-130B or 113.

Mathematical models of experimental problems. Random and systematic designs. Complex experiments. Randomized blocks. Latin and Graeco-Latin squares. Biological assay. Recent developments in the theory of experimental design.

263. Statistical Studies of Risks. (3) I.

Miss Fix

Lectures and laboratory.

Prerequisite: course 130A-130B or 113.

Life and sickness tables. Standard error of a table. Law of Gompertz-Makeham. Standardization of rates of risk. Epidemiological and medical statistics. Theory of growth. Simple random processes explaining various population phenomena. Problems of social and commercial insurance.

264. Statistical Problems of Mass Production and Control of Quality. (3) II.

Lectures and laboratory.

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.

Mr. Loève

Prerequisite: courses 150A-150B, 201A-201B, 165A-165B, 185 or consent of the instructor.

- Recent developments in the theory of probability. Stochastic processes. Markoff chains. Weak and strong central limit problems in the case of dependence.
266. Sampling Surveys. (3) I. Mr. Kuznets in charge
Prerequisite: Mathematics 12 or 130A or consent of the instructor.
Recommended: course 120A-120B.
Mathematical theory of sampling. Best linear unbiased estimates and their variances. Sampling methods: unrestrictedly random, stratified and double sampling methods of Friedman-Wilcox.
267. Advanced Theory of the χ^2 Test. (3) II. Mr. Neyman
Prerequisite: course 260A.
Generalized theorem of Laplace. Tests equivalent in the limit. Various aspects of the χ^2 test. Best asymptotically normal estimates.
- 269A-269B. Recent Developments in the Theory of Statistics. (3-3) Yr.
Mr. Kallianpur, Mr. Barankin
Prerequisite: courses 111A, 120A-120B, and 201A-201B or 165A.
Course 269A is not prerequisite to 269B.
Recent developments in the theory of statistics. Optimum tests with particular reference to multivariate and nonparametric problems. General theory of sequential analysis.
- 280A-280B. Advanced Statistical Inference. (3-3) Yr. Mr. Jeeves
Prerequisite: course 130A-130B. It is recommended that 280C-280D be taken concurrently. Not open for credit to students who have taken 260A-260B.
Continuation of 130A-130B. Generally parallels the material in course 260A-260B, without complicated mathematical proofs.
- 280C. Laboratory Course in Advanced Statistical Inference. (1-2) I.
Mr. Jeeves in charge
Prerequisite: course 280A (to be taken concurrently).
May be taken in conjunction with course 280A-280B. Course 280C is not prerequisite to 280D.
- 280D. Laboratory Course in Advanced Statistical Inference. (2) I.
Mr. Jeeves in charge
May be taken in conjunction with course 280A-280B. Course 280C is not prerequisite to 280D.
- 290M. Seminar on Statistical Problems in Engineering. (2-6) I and II.
Prerequisite: consent of the instructor to enroll. Mr. Hughes
Correlation and regression studies. Pitfalls. Statistical design of cause-and-effect studies in engineering research.
- 290P. Seminar in Probability. (2-6) I and II. Mr. Loève
- 290S. Statistical Seminar. (2-6) I and II. Mr. Neyman in charge
- 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.

MEDICO-MILITARY SCIENCE AND TACTICS

A Division of the School of Medicine

Charles E. Cocks, Jr., Colonel, Medical Corps; *Associate Clinical Professor of Medico-Military Science and Tactics (Chairman of the Division).*

Letters and Science List.—Course 121A–121B is included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

The work of the division consists of an elementary course for first- and second-year medical students and an advanced course for third- and fourth-year medical students. The first year is taught in Berkeley; the second, third, and fourth years at the School of Medicine in San Francisco. All courses are elective. For further information concerning the Medical R.O.T.C. program, consult the Professor of Medico-Military Science and Tactics at the Medical Center in San Francisco.

121A–121B. Elementary Medico-Military Science and Tactics (First Year).
(1–1) Yr. Mr. Cocks
Lectures and demonstrations.

MILITARY SCIENCE AND TACTICS

Thomas L. Waters, Colonel, Artillery; *Professor of Military Science and Tactics (Chairman of the Department).*

James M. Cochran, Lieutenant Colonel, Artillery; *Associate Professor of Military Science and Tactics.*

Marion C. Dorney, Lieutenant Colonel, Ordnance Corps; *Associate Professor of Military Science and Tactics.*

Silvio E. Gasperini, Lieutenant Colonel, Infantry; *Associate Professor of Military Science and Tactics.*

Harold S. Hayward, Lieutenant Colonel, Military Police Corps; *Associate Professor of Military Science and Tactics.*

Wenzel D. Roth, Lieutenant Colonel, Transportation Corps; *Associate Professor of Military Science and Tactics.*

James D. Strong, Lieutenant Colonel, Corps of Engineers; *Associate Professor of Military Science and Tactics.*

George F. Charlton, Major, Infantry; *Associate Professor of Military Science and Tactics.*

Charles S. Dronberger, Major, Artillery; *Assistant Professor of Military Science and Tactics.*

Arthur W. Hackwood, Major, Infantry; *Associate Professor of Military Science and Tactics.*

Winfred L. Hasty, Jr., Major, Quartermaster Corps; *Associate Professor of Military Science and Tactics.*

Thomas R. Lea, Jr., Major, Artillery; *Associate Professor of Military Science and Tactics.*

William R. Mattison, Major, Signal Corps; *Associate Professor of Military Science and Tactics.*

- Andre H. Nelson, Major, Transportation Corps; *Associate Professor of Military Science and Tactics.*
- Frederic H. Palmblad, Major, Signal Corps; *Associate Professor of Military Science and Tactics.*
- Tom S. Phair, Major, Infantry; *Associate Professor of Military Science and Tactics.*
- John D. Blair, Captain, Corps of Engineers; *Assistant Professor of Military Science and Tactics.*
- Rene A. Dussaq, Captain, Infantry; *Assistant Professor of Military Science and Tactics.*
- Thomas E. Griess, Captain, Corps of Engineers; *Assistant Professor of Military Science and Tactics.*
- Grant A. Hooper, Captain, Infantry; *Assistant Professor of Military Science and Tactics.*
- Edmund Scheibe, Captain, Artillery; *Assistant Professor of Military Science and Tactics.*
- Earle K. Stewart, Captain, Infantry; *Assistant Professor of Military Science and Tactics.*
- Hugh H. Tonsfeldt, Captain, Military Police Corps; *Assistant Professor of Military Science and Tactics.*
- Gilbert M. Vick, Captain, Ordnance Corps; *Assistant Professor of Military Science and Tactics.*
- Joel B. Wood, Captain, Infantry; *Assistant Professor of Military Science and Tactics.*

Letters and Science List.—Not more than 8 units of lower division courses in military science may be included in the Letters and Science List of Courses. Upper division military science courses are not included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

LOWER DIVISION COURSES

The lower division or basic courses are prescribed for all first-year and second-year undergraduate male students who are citizens of the United States, able-bodied, and under twenty-four years of age at the time of initial enrollment in the basic course. A first-year or second-year student claiming exemption because of noncitizenship, physical disability, age, or prior military service will present to the Registrar a petition on the prescribed form, for such exemption. Pending action on his petition the student will enroll in the courses prescribed for his year and enter upon the work thereof. These courses consist of four hours of formal instruction per week for two academic years. The instruction prescribed for the first year of the basic course is of a general type, applicable to the Army as a whole. It is not specialized by arm or service. During the second year students may elect to pursue a specialized course of a general introductory nature in one of the eight branches of the Army which are established in the Department of Military Science and Tactics. Uniforms provided by the government are issued to all students of the basic course. The uniform is required to be returned in good condition on completion of the course and students are held liable for the loss of any articles of the uniform.

- 1A. Basic (First Year). (2) I. The Staff (Mr. Hackwood in charge)
 Leadership, drill, and exercise of command; military policy of the United States; National Defense Act and R.O.T.C.; evolution of warfare; military organization; military problems of the United States; first aid and hygiene.

- 1B. Basic (First Year). (2) II. The Staff (Mr. Charlton in charge)
Leadership, drill, and exercise of command; maps and aerial photographs; individual weapons and marksmanship.
- 20A. Basic (Second Year). Infantry. (2) I. Mr. Hooper, Mr. Dussaq
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; organization; weapons and marksmanship—rifle cal. 30, machine gun cal. 30, automatic rifle cal. 30, carbine, rocket launcher and grenades.
- 20B. Basic (Second Year). Infantry. (2) II. Mr. Phair, Mr. Hooper
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; weapons and marksmanship; technique of fire of rifle squad; combat formations; scouting and patrolling; tactics of rifle squad.
- 22A. Basic (Second Year). Corps of Engineers. (2) I. Mr. Blair
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; characteristics of weapons; organization and tactics of small units; organization of the ground and field fortifications; chemical defense.
- 22B. Basic (Second Year). Corps of Engineers. (2) II. Mr. Griess
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; camouflage; explosives and demolitions; mines and booby traps; hand tools and rigging.
- 23A. Basic (Second Year). Signal Corps. (2) I. Mr. Palmblad
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; history of the Signal Corps; organization and mission of the Signal Corps; basic wire communications.
- 23B. Basic (Second Year). Signal Corps. (2) II. Mr. Mattison
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; basic radio communications; organization and signal communications practices of the infantry, armored, and air-borne divisions; communications center procedure.
- 24A. Basic (Second Year). Artillery. (2) I. Mr. Dronberger
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; introduction to AA automatic weapons; characteristics and limitations of AA automatic weapons; service of the piece AA automatic weapons; functioning and nomenclature of M1 rifle.
- 24B. Basic (Second Year). Artillery. (2) II. Mr. Lea
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; principles of radar; introduction to AA guns; characteristics and limitations of AA guns; service of the piece AA guns.
- 25A. Basic (Second Year). Ordnance Corps. (2) I. Mr. Vick
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; the role of ordnance; ammunition matériel; automatic matériel.
- 25B. Basic (Second Year). Ordnance Corps. (2) II. Mr. Dorney
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; small arms matériel; artillery matériel; fire control matériel.

- 26A. Basic (Second Year). Quartermaster Corps. (2) I. Mr. Hasty
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; organization for supply in the Army; organization and function of the Quartermaster Corps; organization, function, and operation of Quartermaster units; classification of supplies.
- 26B. Basic (Second Year). Quartermaster Corps. (2) II. ———
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; property accountability and responsibility; unit and organizational supply; research and development of supplies in the Quartermaster Corps.
- 27A. Basic (Second Year). Transportation Corps. (2) I. Mr. Nelson
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; functions and mission of the Transportation Corps; economics of military transportation.
- 27B. Basic (Second Year). Transportation Corps. (2) II. Mr. Roth
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; organization, operation, military utilization of highway transport facilities.
- 28A. Basic (Second Year). Military Police Corps. (2) I. Mr. Hayward
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; history of the Military Police; military courtesy and customs; military police conduct and authority; military police organizations and functions; motor transportation; communications; control of individuals in the field.
- 28B. Basic (Second Year). Military Police Corps. (2) II. Mr. Hayward
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; military mapping and sketching; military law; individual weapons to include characteristics and operation.

UPPER DIVISION COURSES

Infantry, Corps of Engineers, Signal Corps, AA Artillery, Ordnance Corps, Quartermaster Corps, Transportation Corps, and Military Police Corps Units.

Students who successfully complete the basic course or who have received credit in lieu thereof may apply for enrollment in the advanced course. In general, students selected for this course are those who have shown potentialities for leadership and command, and whose aptitude insures their developing into efficient officer material.

The advanced course consists of five hours of formal instruction per week for two academic years, and is principally specialized in the arm or service elected by the student. It includes a summer camp of six weeks' duration, held between the two academic years of the advanced course. The number enrolled in the advanced course may vary from year to year and is dependent upon the quota allotted annually. For admission to the upper division or advanced courses, students must:

1. Be citizens of the United States and be regularly enrolled in the University of California.
2. Not have reached 27 years of age at the time of initial enrollment in the advanced course.
3. Be selected by the Professor of Military Science and Tactics and the President of the University.

4. Successfully complete such survey and screening tests as may be prescribed.
5. Execute a written agreement with the government to complete the two-year advanced course, including attendance at summer camp.
6. Pass successfully a prescribed physical examination.

Within quota limitations, qualified students eligible for enrollment in the advanced course will be free to select the arm or service of their choice. They must be enrolled in an academic field prescribed by the Army if admission to a unit of a technical service is desired.

An officer-type uniform is furnished the student which becomes his personal property upon successful completion of the advanced course. Each student receives during the two-year period a monthly monetary allowance at a daily rate equal to the value of the commuted ration, as announced by the Department of the Army. Students attending the Advanced Course Summer Camp will receive pay at the rate of \$75 per month, railroad fare to and from camp, quarters, clothing and uniforms, meals, and medical services. Acceptance by the students of the monetary allowances listed above will make the completion of the advanced course a prerequisite to graduating from the University.

Any emoluments mentioned above are in addition to benefits received through the provisions of Public Law 346, provided the ceiling as limited by law on total income is not exceeded.

Successful completion of the advanced R.O.T.C. course, and four years of education at the college level, qualifies the student for appointment and commission by the President as a Second Lieutenant in the United States Army Reserve. Students who complete the advanced course are also eligible to be commissioned by the Governor of the State of California in the University Cadets.

Those students who have successfully completed the advanced R.O.T.C. course, and who have been selected by the Professor of Military Science and Tactics and the President of the University for scholastic excellence, may be designated as "Distinguished Military Graduates." Such Distinguished Graduates are considered for direct commission in the Regular Army, if they are eligible for appointment under the pertinent laws.

For further information about the Reserve Officers Training Corps, consult the Professor of Military Science and Tactics in Room 149, Gymnasium for Men.

130A. Advanced Infantry (First Year). (4) I. Mr. Gasperini

Prerequisite: courses 20A, 20B, or their equivalent.

Leadership, drill, and exercise of command; organization and equipment of the Infantry, with emphasis on the battalion; description, characteristics, and functioning of infantry weapons with emphasis on the machine gun; rifle marksmanship to include range firing; gunnery with infantry weapons.

130B: Advanced Infantry (First Year). (3) II. Mr. Dussaq

Prerequisite: courses 20A, 20B, or their equivalent.

Leadership, drill, and exercise of command; communications within the infantry battalion; hasty field fortifications; combat intelligence; estimate of the situation and combat orders; tactics of the rifle and heavy weapons platoons and companies.

132A. Advanced Corps of Engineers (First Year). (3) I. Mr. Strong

Prerequisite: courses 22A, 22B, or their equivalent.

Leadership, drill, and exercise of command; organization of engineer units and combat divisions; engineer supply; military roads and runways; engineer signal communications; individual weapons and marksmanship; vehicle operations and maintenance.

- 132B. Advanced Corps of Engineers (First Year). (3) II. Mr. Blair
 Prerequisite: courses 22A, 22B, or their equivalent.
 Leadership, drill, and exercise of command; tactics of engineer units; engineer combat intelligence; water supply; bridge design and classification; military teaching methods; weapons and marksmanship.
- 133A. Advanced Signal Corps (First Year). (3) I. Mr. Mattison
 Prerequisite: courses 23A, 23B, or their equivalent.
 Leadership, drill, and exercise of command; the fundamentals of military field wire communications; Signal Corps supply and repair; applied signal communications (division).
- 133B. Advanced Signal Corps (First Year). (3) II. Mr. Mattison
 Prerequisite: courses 23A, 23B, or their equivalent.
 Leadership, drill, and exercise of command; the fundamentals of military radio field communications; communications center and message center procedures; Signal orders and documents; career guidance program for Signal Corps officers; individual weapons and marksmanship.
- 134A. Advanced Artillery (AA) (First Year). (3) I. Mr. Cochran
 Prerequisite: courses 24A, 24B, or their equivalent.
 Leadership, drill, and exercise of command; organization of Artillery AA; basic AA gunnery; marksmanship to include function of carbine, pistol and submachine gun.
- 134B. Advanced Artillery (AA) (First Year). (3) II. Mr. Cochran
 Prerequisite: courses 24A, 24B, or their equivalent.
 Leadership, drill, and exercise of command; communications; troop movement; AA automatic weapons gunnery; AA tactics; motors and transportation.
- 135A. Advanced Ordnance Corps (First Year). (3) I. Mr. Dorney
 Prerequisite: courses 25A, 25B, or their equivalent.
 Leadership, drill, and exercise of command; small arms matériel; ammunition matériel; ammunition supply; individual weapons and marksmanship.
- 135B. Advanced Ordnance (First Year). (3) II. Mr. Vick
 Prerequisite: courses 25A, 25B, or their equivalent.
 Leadership, drill, and exercise of command; artillery matériel; fire control matériel; automatic matériel; functional organization of the Ordnance Corps; individual weapons and marksmanship.
- 136A. Advanced Quartermaster Corps (First Year). (3) I. ———
 Prerequisite: courses 26A, 26B, or their equivalent.
 Leadership, drill, and exercise of command; individual weapons and marksmanship; station supply; depot supply; salvage operations.
- 136B. Advanced Quartermaster Corps (First Year). (3) II. Mr. Hasty
 Prerequisite: courses 26A, 26B, or their equivalent.
 Leadership, drill, and exercise of command; storage, warehousing and materials handling; commissary operations; garrison and field bakery operations; post and field laundry operations; food service activities; maintenance and reclamation of quartermaster supplies; procurement, storage and distribution of petroleum products; graves registration and mortuary activities.
- 137A. Advanced Transportation Corps (First Year). (3) I. Mr. Roth
 Prerequisite: courses 27A, 27B, or their equivalent.
 Leadership, drill, and exercise of command; military traffic manage-

ment; army port operations; organization of Transportation Corps staff sections at various levels of command; study of individual weapons and marksmanship.

- 137B. Advanced Transportation Corps (First Year). (3) II. Mr. Nelson
Prerequisite: courses 27A, 27B, or their equivalent.
Leadership, drill, and exercise of command; railroad organization and operation (civilian and military); stevedoring; harborcraft and marine maintenance; highway operations in overseas theaters; weapons and marksmanship.
- 138A. Advanced Military Police Corps (First Year). (3) I. Mr. Tonsfeldt
Prerequisite: courses 28A, 28B, or their equivalent.
Leadership, drill, and exercise of command; individual weapons and marksmanship; criminal investigation I; domestic disturbances; guardhouses and confinement facilities.
- 138B. Advanced Military Police Corps (First Year). (3) II. Mr. Tonsfeldt
Prerequisite: courses 28A, 28B, or their equivalent.
Leadership, drill, and exercise of command; protection of vital installations; prisoners of war; town patrolling; traffic control I; individual weapons and marksmanship.
- 140A. Advanced Infantry (Second Year). (3) I. Mr. Phair
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, major infantry units.
- 140B. Advanced Infantry (Second Year). (3) II. Mr. Gasperini
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.
- 142A. Advanced Corps of Engineers (Second Year). (3) I. Mr. Griess
Prerequisite: courses 132A and 132B.
Leadership, drill, and exercise of command; military teaching methods; military administration; psychological warfare; command and staff; motor movements; engineer support for army; communications zone.
- 142B. Advanced Corps of Engineers (Second Year). (3) II. Mr. Strong
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. Palmblad
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. Palmblad
Prerequisite: courses 133A and 133B.
Leadership, drill, and exercise of command; Signal Corps radio communications equipment and matériel; higher echelon Signal Corps com-

munications 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. Lea
 Prerequisite: courses 134A and 134B.
 Leadership, drill, and exercise of command; military teaching methods and administration; psychological warfare; AA tactics, advanced; AA gunnery; supply and evacuation.
- 144B. Advanced Artillery (AA) (Second Year). (3) II. Mr. Dronberger
 Prerequisite: courses 134A and 134B.
 Leadership, drill, and exercise of command; military law; AA matériel; military team; command and staff; new developments; combat intelligence; field artillery capabilities and employment; geographical foundations of national power.
- 145A. Advanced Ordnance Corps (Second Year). (3) I. Mr. Dorney
 Prerequisite: courses 135A and 135B.
 Leadership, drill, and exercise of command; military teaching methods; military administration; psychological warfare; maintenance and supply; command and staff procedures; combat intelligence.
- 145B. Advanced Ordnance Corps (Second Year). (3) II. Mr. Vick
 Prerequisite: courses 135A and 135B.
 Leadership, drill, and exercise of command; military law and boards; matériel specialty; geographical foundations of national power.
- 146A. Advanced Quartermaster Corps (Second Year). (3) I. _____
 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. _____
 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. Nelson
 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.
- 147B. Advanced Transportation Corps (Second Year). (3) II. Mr. Roth
 Prerequisite: courses 137A and 137B.
 Leadership, drill, and exercise of command; advanced military traffic management and highway activities in theaters of operations; command and staff functions; military law; movements control; combat intelligence; geographical foundations of national power.

- 148A. Advanced Military Police Corps (Second Year). (3) I. Mr. Tonsfeldt
Prerequisite: courses 138A and 138B.
Leadership, drill, and exercise of command; military administration;
psychological warfare; military teaching methods; criminal investigation
II; train and town patrol; traffic control II.
- 148B. Advanced Military Police Corps (Second Year). (3) II. Mr. Hayward
Prerequisite: courses 138A and 138B.
Leadership, drill, and exercise of command; military law and boards;
principles of police administration; command and staff; the military team;
supply and evacuation; military government; military police problems in
theaters of operations; combat intelligence; geographical foundations of
national power.

MUSIC

- Ernest Bloch, *Professor of Music (Summer Sessions only)*.
Manfred F. Bukofzer, Ph.D., *Professor of Music*.
Charles C. Cushing, M.A., *Professor of Music*.
*Roger Sessions, A.B., Mus.B., *Professor of Music*.
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*.
Edward B. Lawton, Jr., A.B., *Associate Professor of Music*.
Joaquin Nin-Culmell, Diplôme de fin d'Etudes, Schola Cantorum; Premier
Accessit de Composition Musicale, Conservatoire National, Paris, *Associate
Professor of Music (Chairman of the Department)*.
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*.
Edgar H. Sparks, Ph.D., *Assistant Professor of Music*.
Mary Groom Jones, *Associate in Music*.
Ernest Kubitschek, *Associate in Music*.
George H. Kyme, M.A., *Associate in Music and Supervisor of the Teaching
of Music*.
Severin Saphir, A.B., *Associate in Music*.
Herman C. Trutner, III, *Associate in Music*.



THE GRILLER QUARTET of the University of California:

- Sidney Griller, C.B.E., F.R.A.M.
Jack O'Brien, L.R.A.M.
Philip Burton, F.R.A.M.
Colin Hampton, F.R.A.M.



- Madi Bacon, M.A., *Lecturer in Music*.
James Berdahl, M.A., *Lecturer in Music*.
Vincent H. Duckles, M.A., Ed.D., *Lecturer in Music Bibliography*.
Reginald Krieger, A.B., *Lecturer in Music for the spring semester*.
Marjorie Gear Petray, A.B., *Lecturer in Music*.
Jerome W. Rosen, M.A., *Lecturer in Music*.

* Absent on leave, 1951-1952.

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 69.

Department Major Adviser: Mr. Denny.

Preparation for the Major.—Required: Freshman year: Music A, 1A, 2, 3A; Sophomore year: Music 1B, 3B, 4, 21A–21B. Entering students who plan to major in music should confer with Mr. Sparks or Mr. Imbrie. The major in music presupposes ability in piano playing; an advisory examination in piano, required of all entering students, will be given by the department at the beginning of each semester. Instruction in piano, organ, violin, and voice is offered by University Extension.

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 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, either 120A or 120B, 122.

III. *Performance.*—At least two of the following courses: 141, 143, 144, 145, 146; 147, 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 literature.

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 study-list regulations, page 52.

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. Cushing. Candidates for the General Secondary Credential, after receiving the A.B. degree, must spend two graduate semesters at this University; the teaching major, normally completed by the end of this period, specifically requires: (a) Two courses chosen from 104A, 104B, 107A, or 107B. (b) Courses 108, 300A–300B, 409, 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 and competence in either voice or one orchestral or band instrument, and four units from 328, 329A, 329B, 329C. Students without previous experience in playing an orchestral or

band instrument are urged to undertake work in the 329 courses as soon as possible, preferably in the lower division. Credit of 3 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.

Higher Degrees.—Advisers: M.A. degree, Mr. Boyden, Mr. Lawton; Ph.D. degree, Mr. Bukofzer. See also the ANNOUNCEMENT OF THE GRADUATE DIVISION and the special announcements issued by the department concerning the M.A. and Ph.D. degrees.

LOWER DIVISION COURSES

Theory

A. Musicianship. (2) I and II.

Miss Bacon, Miss Howe, Mrs. Petray (in charge), Mr. Rosen,
Mr. Saphir, Mr. Sparks

Elements of music, with ear training, sight singing, and dictation.

One section will be offered each semester for students who do not plan to major in music.

1A. Musicianship. (2) II.

Mrs. Petray (in charge), Mr. Rosen, Mr. Saphir, Mr. Sparks

A continuation of course A, which is prerequisite.

1B. Musicianship. (2) I and II.

Mrs. Petray, Mr. Sparks

A continuation of course 1A, which is prerequisite.

2. Elementary Counterpoint. (3) I.

Mr. Boyden (in charge), Mr. Kerman, Mr. Rosen, Mr. Sparks

Prerequisite: course A (may be taken concurrently). One section will be offered for students who do not plan to major in music.

Sixteenth-century polyphony: theory and practice. Preparatory exercises and motet writing.

3A. Elementary Harmony. (3) II.

Miss Howe (in charge), Mr. Kerman, Mr. Rosen

Prerequisite: course 2; course 1A (may be taken concurrently). One section will be offered for students who do not plan to major in music.

3B. Intermediate Harmony. (3) I.

Miss Howe, Mr. Rosen

A continuation of course 3A, which is prerequisite.

4. Intermediate Counterpoint and Harmony. (3) II.

Prerequisite: course 3B.

Miss Howe, Mr. Kerman

History and Literature

21A-21B. History and Literature of Music. (3-3) Yr. Mr. Boyden

Prerequisite: course 2 and 3A, or consent of the 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.

27A-27B. Introduction to Musical Literature. (3-3) Yr. Mr. Nin-Culmell

Two lectures and one section meeting per week.

Course 27A or consent of the instructor is prerequisite to course 27B.

Lectures, illustrations, and readings designed to furnish a general appreciation of music. Weekly section meetings for listening, discussions, and written work. Intended primarily for students whose major is not music.

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
(Formerly numbered 75.)
Two two-hour rehearsals per week.
Open to any student in the University whose technical proficiency meets the requirements of concert performance.
43. University Concert Band. (2) II. Mr. Cushing
(Formerly numbered 25.)
Two hour-and-a-half rehearsals and one section hour per week.
Open to any student in the University whose technical proficiency meets the requirements of concert performance.
44. University Chorus. (2) I and II. Mr. Lawton
(Formerly numbered 35.)
Two hour-and-a-half rehearsals and one section hour per week.
- *46. Chamber Music Ensemble. (1) Mr. Boyden
(Formerly numbered 65.)
Two class hours per week.
Open to any student of sufficient technical ability to take part in ensemble combinations for strings, wind instruments, piano.
48. Piano Ensemble. (1) I and II. Mrs. Petray
(Formerly numbered 55.)
Two class hours per week.
Study and interpretation of four- and eight-hand piano literature.
Open to any student in the University of sufficient technical proficiency.

UPPER DIVISION COURSES**Theory**

Students should take courses 100 and 101 in the junior year.

100. Keyboard Harmony. (2) I. Mr. Denny, 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. Mr. Denny, Mr. Sparks
Prerequisite: course 100.
- 104A-104B. Advanced Counterpoint and Harmony. (3-3) Yr. Mr. Denny
Prerequisite: courses 2 and 4.
- 105A-105B. Principles of Composition. (3-3) Yr. Mr. Cushing
Prerequisite: course 104A-104B.
- 106A-106B. Canon and Fugue. (3-3) Yr. Mr. Imbrie
Prerequisite: course 104A-104B.
- 107A-107B. Studies in Musical Analysis. (3-3) Yr. Miss Howe
Prerequisite: course 4.

* Not to be given, 1951-1952.

108. Instrumentation. (3) II. Mr. Rosen
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.

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.
(Formerly numbered 175.) Mr. Nin-Culmell
Prerequisite: 4 units in course 41.
143. Advanced University Concert Band. (2) II.
(Formerly numbered 125.) Mr. Cushing
Prerequisite: 4 units in course 43.
144. Advanced University Chorus. (2) I and II.
(Formerly numbered 135.) Mr. Lawton
Prerequisite: 4 units in course 44.
145. Repertory Chorus. (2) I and II. Mr. Lawton
Prerequisite: 4 units in course 144 or the equivalent and consent of the instructor. Enrollment limited to thirty-two students.
- *146. Advanced Chamber Music Ensemble. (1) Mr. Boyden
(Formerly numbered 165.)
147. String Quartet Repertory. (2) I.
The Griller Quartet (Mr. Griller in charge)
(Formerly numbered 185.)
Prerequisite: two semesters of course 146 and consent of the instructor.
148. Advanced Piano Ensemble. (1) I and II. Mrs. Petray
(Formerly numbered 155.)

History and Literature

Courses in this group will be given in rotation: renaissance, baroque, classic, romantic, modern. Prerequisite: course 21A-21B or consent of the instructor.

Renaissance Period

- 115A. Survey of the Period, 1430-1600. (3) I. Mr. Kerman

Baroque Period

- 116A. Survey of Musical Literature, 1600-1750. (3) I. Mr. Boyden
A survey of musical literature from Monteverdi to Handel and J. S. Bach.
- 116D. The Cantatas of J. S. Bach and the Oratorios of G. F. Handel. (3) II.
Mr. Boyden
- *116E. The Performance of Music, 1600-1750. (3) I. Mr. Boyden
Prerequisite: experience in playing an instrument or in singing and a reading knowledge of French, German, or Italian.

* Not to be given, 1951-1952.

Classic Period

- 117A. Survey of the Period, 1750-1827. (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. _____
- *117D. The Chamber Music of Mozart. (3) I. Mr. Boyden

Romantic Period

- *118A. Survey of the Period from Weber and Schubert to the Beginning of
Impressionism. (3) I. Mr. Bukofzer
- 118B. The Operas of Verdi. (3) I. Mr. Bukofzer
- *118D. Orchestral Music in the Nineteenth Century. (3) I. Mr. Denny

Modern Period

- 119A. Survey of the Period. (3) II. Mr. Imbrie
(Formerly numbered 119D.)
- *119B. Selected Modern Works. (3) I. Mr. Cushing
A critical and analytical study of works by Mussorgsky, Debussy, Ravel,
Strawinsky, Hindemith, Bartók, and Bloch.
- *119C. Modern French Music. (3) I. Mr. Cushing
(Formerly numbered 119A.)
Critical and analytical studies of selected works of French composers
from 1870 to the present, with special reference to Fauré, Debussy, and
Ravel.
- *119E. Choral Music of the Twentieth Century. (3) II. Mr. Lawton

Forms and Mediums

In special cases any student of at least junior standing may take course 120A
or 120B with consent of the instructor.

- 120A. Choral Literature: Josquin des Prez to Handel. (3) I. Mr. Lawton
- *120B. Choral Literature: Bach to the Present Day. (3) II. Mr. Lawton
- *122A. Opera: Baroque and Classic. (3) I. Mr. Bukofzer
- *122B. Opera: Romantic and Modern. (3) II. Mr. Bukofzer

National Schools

- *130. The Music of Spain. (3) II. Mr. Nin-Culmell

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)

* Not to be given, 1951-1952.

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 139.

200. Fundamentals of Music Bibliography. (2) I. Mr. Duckles
- *201. Seminar: Studies in Orchestration. (2) I. Mr. Cushing
Prerequisite: course 109.
Enrollment limited to ten students.
203. Seminar in Composition. (2-4)
203A. Technical Projects. (2) I and II. Mr. Cushing, Mr. Denny
I: Mr. Cushing; II: Mr. Denny.
203B. Free Composition. (2) I and II. Mr. Imbrie
*203C. Advanced Composition. (2-4) I and II. Mr. Sessions
Prerequisite: courses 105A-105B, 106A-106B, or the 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.
205. Seminar in Choral Scoring. (2) II. Mr. Lawton
- *210A-210B. Seminar in Mensural Notation. (3-3) Yr. Mr. Lawton
211. Seminar: Studies in Musical Research. (3) II. Mr. Boyden
Prerequisite: course 200.
The work consists of two parts: a class problem designed to strengthen general background, and an individual research problem. The topic of the research problem must be approved by the instructor before the first meeting of the course.
212. Seminar: The English Madrigal. (3) I. Mr. Kerman
- *213A-213B. Seminar: Music of the Renaissance. (3-3) Yr. Mr. Sparks
- 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. Bukofzer
Prerequisite: course 200.
The topic for 1951-1952 is:
The concerto from the Baroque period to the present.
Topics to be given in following years are:
The history of dissonance treatment; reading of musical theorists; principles of musical structure from the Gregorian period to the present.
250. Seminar in the Technique of Musicological Research. (2-4) I and II. Mr. Bukofzer
Prerequisite: course 200, 12 units from courses 210, 211, 212, 213, 214, or 215, 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.

* Not to be given, 1951-1952.

TEACHING METHODS COURSES†

- 300A-300B. Musical Literature for Secondary Schools. (2-2) Yr.
 300A. Choral Literature. Miss Bacon. Miss Bacon, Mr. Krieger
 300B. Instrumental Literature. Mr. Krieger.
 Repertory for high school and junior college; problems of leadership, presentation, organization, program planning.
328. Methods of Teaching Vocal Techniques. (1) I and II. Mrs. Jones
 Prerequisite: course 100.
 Principles of choral techniques; adapting best features to meet ensemble choral conditions; necessary transposition; care of adolescent voices; voice-testing; tone-production; evaluation of teaching materials.
 May be repeated once without duplication of credit.
329. Instrumental Methods. (1) Mr. Berdahl, Mr. Kyme
 329A. Stringed Instruments. (1) I and II. Mr. Kyme.
 329B. Brass Instruments. (1) I. Mr. Berdahl.
 329C. Wood-Wind Instruments. (1) II. Mr. Berdahl.
 Methods of teaching orchestra and band instruments. Each course may be repeated once without duplication of credit.

PROFESSIONAL COURSES

409. Band Instrumentation. (2) II. Mr. Rosen
 Prerequisite: courses 101 and 108.
 A study of the instruments of the band; practice in scoring for selected wind instruments and for concert band.
- 435A-435B. Conducting. (2-2) Yr. Mr. Cushing
 435A. Choral Conducting.
 435B. Instrumental Conducting.
 Prerequisite: courses 101 and 108 (may be taken concurrently).
 Not open to juniors.

The following classes, intended for students of demonstrable aptitude for a specific instrument, aim to develop mastery. Open to any student of the University. Each class is limited to an enrollment of eight; music majors enrolled in orchestra, band, or chamber music will be given preference. A course may be repeated.

- 445D. Bassoon. (½) I and II. Mr. Kubitschek
 455A. French Horn. (½) I and II. Mr. Trutner

NAVAL SCIENCE

John V. Peterson, Captain, U.S.N.; *Professor of Naval Science (Chairman of the Department)*.

Charles A. Coutts, Lieutenant Commander, U.S.N.R.; *Associate Professor of Naval Science*.

George P. Wolf, Major, U.S.M.C.; *Associate Professor of Naval Science*.

Oliver H. Perry, Jr., Lieutenant, U.S.N.; *Assistant Professor of Naval Science*.

† See ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Letters and Science List.—Not more than 8 units of lower division courses in this department may be included in the Letters and Science List of Courses. Upper division naval science courses are not included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Courses in this department are normally restricted to students who are regularly enrolled members of the Naval Reserve Officers' Training Corps. Details concerning enrollment are available in Room 47, Gymnasium for Men, Office of the Department of Naval Science. Candidates must be able to complete all requirements of the Naval R.O.T.C. curriculum, without serious interference from or with other academic work which is required for the bachelor's degree.

All students enrolled in the Naval Reserve Officers' Training Corps are required to engage in drill or practical exercises two hours per week.

LOWER DIVISION COURSES

- 1A. Naval Orientation, Part I. (3) I. _____
Naval history, functions and organization, and the characteristics of naval ships.
- 1B. Naval Orientation, Part II. (3) II. _____
Survey of basis of naval justice and customs; elements of leadership; basic seamanship.
- 2A. Naval Weapons. (3) I. _____
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. _____
Prerequisite: course 2A.
Antiaircraft fire control, fire control systems, naval electronics equipment, CIC operations, torpedo control, spotting, shore bombardment, guided missiles.

UPPER DIVISION COURSES

- 101A. Navigation; Piloting. (3) I. Mr. Coutts
Navigation instruments and equipment; dead reckoning; piloting; maneuvering board; rules of the road; aerology.
- 101B. Navigation; Celestial. (3) II. Mr. Coutts
The theory and technique of surface and aerial navigation.
- 102A. Naval Engineering. (3) I. Mr. Perry
Naval boilers and auxiliaries; naval steam turbines; naval Diesel engines; aircraft engines.
- 102B. Damage Control and Naval Officer Orientation. (3) II. Mr. Perry
Ship's stability and fire fighting. The last half of this course is designed to prepare the student for his first assignment afloat, and includes naval justice and leadership.
- 103M. History of the Art of War. (3) I. Mr. Wolf
Evolution of military weapons, tactics, strategy and concepts of war. Application of principles of war to selected battles from European history.
- 104M. U. S. Military History and Policy. (3) I and II. Mr. Wolf
Development of land forces and military policy of the United States. Application of the principles of war to principal battles and campaigns.

- 105M. Amphibious Operations. (3) II. Mr. Wolf
 Broad introduction to the specialized field of amphibious warfare by a limited treatment of the factors pertaining to its planning and execution.
- 107S. Naval Finance and Accounting. (3) I. _____
 Open to junior students only.
 Supply Corps organization; naval funds and appropriations; property appropriation and cost accounting ashore.
- 108S. Supply Afloat. (3) II. _____
 (Formerly numbered 107S.)
 Prerequisite: course 107S.
 The Navy Supply system; organization and operation of the Supply Department afloat; basic accounting afloat.
- 109S. Supply Ashore. (3) I. _____
 (Formerly numbered 106S.)
 Open to senior students only.
 Supply Corps organization, operation and accounting ashore.
- 110S. Supply Afloat. (3) II. _____
 (Formerly numbered 107S.)
 Prerequisite: course 109S.
 Supply Corps organization, operation and accounting afloat.

NEAR EASTERN LANGUAGES

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*.

William Popper, Ph.D., LL.D., *Professor of Semitic Languages, Emeritus*.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: Mr. Fischel.

Preparation for the Major.—Course 13A–13B or 25; 6 units of Hebrew or Greek; a reading knowledge of French and German.

The Major.—Required: 16 units in language courses in the department. The remaining 8 units may include not more than 6 units of lecture courses in the department and, with departmental approval, from 2 to 8 units in other departments.

Courses in History and Religion

Elective courses not requiring a knowledge of any Near Eastern language.

- 13A–13B. Ancient History of the Near East. (3–3) Yr. Mr. Lutz
 Egypt, Babylonia, Iran, Syria, Phoenicia, Palestine, Asia Minor, and the Aegean Islands from the Paleolithic Age to the Roman Period. Course 13A is not prerequisite to 13B.

25. History of Mohammedan Civilization. (1) I. Mr. Fischel
A survey of the origin and development of the Mohammedan civilization; the background for the understanding of the modern Islamic world in Asia and Africa.
- 102A-102B. Religion and Mythology of Egypt, Babylonia, and Assyria. Mr. Lutz
(2-3; 2-3) Yr.
Prerequisite: junior standing and course 13A-13B or 25A-25B.
110. Introduction to Hebrew Literature. (1) I. Mr. Fischel
Survey of Hebrew literature, covering post-Biblical, medieval, and modern literature in various centers of the Orient and Europe.

Language Courses

The specific courses given in any year, the hours thereof, and the authors read, will depend upon the needs of the students; courses numbered over 200 may be repeated for credit without duplication of work.

Course 21A-21B or a satisfactory equivalent in other languages is prerequisite to all upper division language courses in the department.

- 21A-21B. Elementary Hebrew. (3-3) Yr. Mr. Fischel
- 121A-121B. Intermediate Hebrew. (2-2) Yr. Mr. Fischel
Rapid reading of selections from the historical books of the Old Testament.
- 131A-131B. Elementary Arabic. (3-3) Yr. Mr. Fischel
- *141A-141B. Elementary Syriac. (2-2) Yr. Mr. Fischel
- 151A-151B. Elementary Assyrian. (3-3) Yr. Mr. Lutz
- *152A-152B. Elementary Sumerian. (2-2) Yr. Mr. Lutz
Prerequisite: course 151A-151B.
- 161A-161B. Elementary Egyptian. (3-3) Yr. Mr. Lutz
Prerequisite: course 21A-21B or 6 units of Greek.
- *171A-171B. Elementary Coptic. (2-2) Yr. Mr. Lutz
Prerequisite: course 21A-21B or 6 units of Greek.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. Lutz, Mr. Fischel

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- 224A-224B. Advanced Biblical Hebrew. (2-2) Yr. Mr. Fischel
One or more of the prophetic and poetical books, with special attention to literary form.
- 227A-227B. Post-Biblical Hebrew. (1-1) Yr. Mr. Fischel
Unvocalized texts.
- 231A-231B. Advanced Arabic. (3-3) Yr. Mr. Fischel
Selections from (a) Historical works; (b) The Thousand and One Nights.
- 232A-232B. Advanced Arabic. (3-3) Yr. Mr. Fischel
232A. The Koran; 232B. Poetry.
- †241A-241B. Advanced Syriac. (2-2) Yr. Mr. Fischel
- †251A-251B. Advanced Assyro-Babylonian. (2-2) Yr. Mr. Lutz

* Not to be given, 1951-1952.

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

†252A-252B. Advanced Sumerian. (2-2) Yr.	Mr. Lutz
†261A-261B. Advanced Egyptian. (2-2) Yr.	Mr. Lutz
†271A-271B. Advanced Coptic. (2-2) Yr.	Mr. Lutz
280A-280B. Seminar. (2-5; 2-5) Yr.	Mr. Lutz, Mr. Fischel
290A-290B. Special Study. Yr.	Mr. Lutz, Mr. Fischel

Credit according to work accomplished.

NURSING

- Pearl Castile, R.N., Ed.D., *Associate Professor of Nursing.*
 Hannah Binhammer, R.N., M.A., *Assistant Professor of Nursing.*
 Mary T. Harms, R.N., M.A., *Assistant Professor of Nursing.*
 Jeannette S. Hiller, R.N., M.A., P.H.N., *Assistant Professor of Nursing.*
 Alice E. Ingmire, R.N., Ed.D., *Assistant Professor of Nursing.*
 Dorothy K. Loveland, R.N., M.A., *Assistant Professor of Nursing.*
 Amy A. MacOwan, R.N., Ed.D., *Assistant Professor of Public Health Nursing.*
 Lura M. Morse, Ph.D., *Assistant Professor of Home Economics.*
 Mildred E. Newton, R.N., Ed.D., *Assistant Professor of Nursing.*
 Margaret A. Tracy, R.N., M.S., *Assistant Professor of Nursing (Chairman of the Department).*
 Ethel Hammond, R.N., M.A., P.H.N., *Instructor in Nursing.*
 Ann Hill, J.D., R.N., M.P.H., P.H.N., *Instructor in Nursing.*
 Bernice C. Hudson, R.N., M.A., *Instructor in Nursing.*
 Ruth L. Lotspeich, R.N., B.S., *Instructor in Nursing.*
 Ruth E. Nutting, R.N., M.N., *Instructor in Nursing.*
 Frances Rule, R.N., M.S., *Instructor in Nursing.*
 Kathryn M. Smith, R.N., B.S., *Instructor in Nursing.*
 Rose Weiss, R.N., M.A., *Instructor in Nursing.*



- Henry F. Albronda, M.D., *Clinical Instructor in Psychiatry.*
 Henry B. Bruyn, M.D., *Assistant Professor of Pediatrics.*
 Milton J. Chatton, M.D., *Instructor in Medicine.*
 Orville F. Grimes, M.D., *Assistant Professor of Surgery.*
 Phyllis Haley, Ph.D., *Lecturer in Educational Psychology.*
 C. Henry Kempe, M.D., *Assistant Professor of Pediatrics and Lecturer in Child Health, School of Nursing.*
 John A. Kerner, M.D., *Clinical Assistant in Obstetrics and Gynecology and Lecturer in Obstetrics and Gynecology, School of Nursing.*
 John B. Lagen, M.D., *Associate Professor of Medicine.*
 Martin B. Loeb, A.B., *Assistant Professor of Social Welfare and Lecturer in Social Welfare, School of Nursing.*
 Ida M. Oswald, M.S.W., *Field Work Supervisor in Social Welfare and Lecturer in Social Welfare, School of Nursing.*
 Kenneth J. Poppen, M.D., *Lecturer in Pathology.*
 Alex C. Sherriffs, Ph.D., *Assistant Professor of Psychology and Lecturer in Child Psychology, School of Nursing.*

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

Henry K. Silver, M.D., *Assistant Professor of Pediatrics and Lecturer in Pediatrics, 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 and Lecturer in Dermatology, School of Nursing.*

Mary King Vickery, R.N., B.S., *Lecturer in Nursing.*

Olive Walkley, R.N., A.B., B.N., *Lecturer in Psychiatric Nursing.*

(GIVEN AT BERKELEY)

The following courses are open only to students 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. Miss Hammond
A study of public health nursing functions and activities.
419. The Field of Public Health Nursing. (3) I and II. Miss MacOwan
Consideration of the essentials of a good public health nursing service.
432. Principles of Nursing Education. (2) I. _____
Required of all candidates for the Certificate in Nursing Education.
434. Principles of Ward Management and Teaching. (3) II. Miss Castile
Prerequisite: course 432, Education 110, or consent of the instructor.
Required of all candidates for the Certificate in Nursing Education.

GRADUATE COURSES

As a condition of enrollment in a graduate course the student must have been admitted to the Graduate Division, Northern Section; completed 15 units of advanced work basic to the proposed major subjects for a higher degree; be certified by the Department of Nursing as to eligibility to complete the program; and satisfy professional requirements as established by the School of Nursing.

Specific prerequisites: completion of 5 units of education courses including Education 110, and 5 units of upper division social economics courses including Social Welfare 100.

200. Problems of Administration in Nursing. Seminar. (2) I. Miss Tracy
Prerequisite: 6 units chosen from courses 416, 418, 419, 432, and 434.
Basic material of study will be school surveys; national surveys and contributions to education in the field of administration.
201. Surveys in Nursing. (3) II. Miss Tracy
Lectures and laboratory.
Prerequisite: 6 units chosen from courses 416, 418, 419, 432, and 434.
Training in practical application of principles and techniques developed in school surveys, including additional field work equivalent to two hours per week.
202. Principles and Techniques of Supervision in Nursing. Seminar. (2) I. Miss MacOwan
Prerequisite: 6 units chosen from courses 416, 418, 419, 432, and 434, or by consent of the instructor.
A consideration of the principles and techniques of supervision appropriate for a modern program of education.
203. Nursing Staff Personnel Problems. (3) II. Miss Castile
A course designed for administrators and teachers in leadership positions and for those concerned with teacher welfare.

204. Curriculum Development in Nursing. (3) I. Miss Castile
Problems of curriculum construction as they relate to the selection and organization of material into units of instruction.
205. Problems in Curriculum Development. (2) II. Miss MacOwan, Miss Castile
Prerequisite: course 204.
Designed especially for administrators, supervisors, and teachers who have problems in curriculum development.
206. Curriculum and Teaching Problems in Nursing. Practicum. (6) II. Miss Castile, Miss MacOwan
An opportunity for qualified students to work on practical curriculum and teaching problems under guidance.
- *207. Historical Foundation of Nursing. (3) II. Miss Newton
An evaluation of cultural, religious, secular, military, and educational influences upon nursing. Emphasis on international relationships.
208. Counseling. (3) II. Mrs. Ingmire
A comprehensive analysis of the problems and programs of 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

420. Field Work in Public Health Nursing. (12) I and II. Miss Hammond, Miss Hill
Prerequisite: 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 Lotspeich in charge
Prerequisite: 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. _____
Prerequisite: 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 and II. Mrs. Hiller
418. The Nurse in Public Health. (3) I and II. Mrs. Hiller
Parallels course 418 given at Berkeley.
- 418E. Community Nursing. (2) I and II. Mrs. Hiller
421. History of Nursing. (2) I. _____
423. Professional Adjustments. (1) I and II. Miss Lotspeich

* Not to be given, 1951-1952.

425. Pathology. (1) I.
- 427A-427B. Pharmacology and Therapeutics. (2-1) Yr.
Miss Binhammer, Mr. Lagen
432. Principles of Nursing Education. (2) I and II. Miss Lotspeich
Parallels course 432 given at Berkeley.
- 435A-435B. Nursing Arts. (5-1) Yr.
Mrs. Ingmire, Miss Hudson, Miss Rule
- 440A. Principles of Medicine. (2) I and II. Mr. Chatton, Miss Torrey
- 440E. Medical Nursing. (2) I and II. Miss Binhammer
- 440F. Medical Nursing. (2) I and II. Miss Binhammer
- 441A. Principles of Psychiatry. (1) I and II. Mr. Albronda
- 441E. Psychiatric Nursing. (2) I and II. Miss Walkley
- 442A. Introduction to Surgery. (2½) I and II. Mr. Grimes
- 442E. Surgical Nursing. (3) I and II. Miss Loveland
- 442F. Surgical Nursing. (2) I and II.
Miss Loveland, Miss Harms, Mrs. Vickery
- 444A. Principles of Pediatrics. (2) I. Mr. Silver
- 444E. Pediatric and Communicable Disease Nursing. (2) I and II.
Miss Smith
- 444F. Pediatric and Communicable Disease Nursing. (2) I and II.
Miss Smith
446. Principles of Communicable Diseases. (2) I. _____
- 448A-448B. Introduction to Obstetrics and Gynecology. (1-2) Yr.
Mr. Kerner
- 448E. Obstetrical Nursing. (2) I and II. Miss Weiss

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) I and II. Miss Morse
Prerequisite: Home Economics 111.
111. Nutrition. (3) I. Miss Morse
Parallels Home Economics 111 given at Berkeley.

PSYCHOLOGY

111. Child Psychology. (2) I. Mr. Sheriffs
Parallels Psychology 111 given at Berkeley.

PUBLIC HEALTH

125. Child Health. (2) I and II. Mr. Kempe
Parallels Public Health 125 given at Berkeley.

145. Community Control of the Communicable Diseases. (3) I. Mr. Stiles
Parallels Public Health 145 given at Berkeley.

SOCIAL WELFARE

100. The Field of Social Welfare. (3) I. Mrs. Oswald
Parallels Social Welfare 100 given at Berkeley.
106. Community. (2) II. Mr. Loeb
Parallels Social Welfare 106 given at Berkeley.

OCEANOGRAPHY

Marine Sciences

Courses in oceanography leading to the master's or doctor's degree in oceanography and certain of the marine sciences are offered for a limited number of qualified students at the Scripps Institution of Oceanography at La Jolla, California. Detailed information concerning the courses may be found in the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES. For further information concerning the Institution refer to the Registrar of the University of California, 405 Hilgard Avenue, Los Angeles 24, or write to the Director of the Institution.

OPTOMETRY

Kenneth B. Stoddard, Ph.D., *Professor of Physiological Optics and Optometry (Chairman of the Department)*.

Meredith W. Morgan, Jr., Ph.D., *Professor of Physiological Optics and Optometry*.

Ralph S. Minor, Ph.D., *Professor of Physics and Optometry, Emeritus*.

Gordon L. Walls, Sc.D., *Associate Professor of Physiological Optics and Optometry and Lecturer in Physiology*.

Jack T. Hobson, B.S., *Assistant Professor of Optometry*.

▽ Elwin Marg, Ph.D., *Assistant Professor of Optometry*.

Frederick L. Mason, M.A., *Assistant Professor of Optometry*.

Owen C. Dickson, M.D., *Assistant Clinical Professor of Ophthalmology*.

Edward Philip Drescher, M.D., M.S., *Assistant Clinical Professor of Ophthalmology*.

Henry B. Peters, M.A., *Assistant Clinical Professor of Optometry*.

James T. Crosby, Jr., B.S., *Clinical Instructor in Optometry*.

Ferd T. Elvin, A.B., *Clinical Instructor in Optometry*.

Robert F. Harrigan, B.S., *Clinical Instructor in Optometry*.

Frederick W. Hebbard, M.S., *Clinical Instructor in Optometry*.

Robert W. Lester, A.B., *Clinical Instructor in Optometry*.

Edward Ralph Ligon, B.Ed., B.S., *Clinical Instructor in Optometry*.

Ralph M. Marshall, A.B., *Clinical Instructor in Optometry*.

Henry S. Mioduchowski, B.S., *Clinical Instructor in Optometry*.

Harry J. Raab, B.S., *Clinical Instructor in Optometry*.

Blanche E. Smith, B.S., *Clinical Instructor in Optometry*.



Sherburne F. Cook, Ph.D., *Lecturer in Optometry and Professor of Physiology*.

▽ On military leave, 1951-1952.

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 69.

UPPER DIVISION COURSES

Prerequisite.—Physics 2A–2B, 3A–3B, Chemistry 1A, 8, Mathematics 3A, Bacteriology 7, †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) Yr. Mr. Mason
Prerequisite: Physics 108A–108B.

The mathematical development of the paraxial laws of optical image formation, employing the methods of Gauss. Application to the optical devices used to evaluate and aid the functions of vision. Classroom computation of marginally corrected lenses, iseikonic lenses, and contact lenses.

102A–102B. Elementary Theoretical Optometry. (3–4) Yr. Mr. Mason, Mr. Hebbard

One unit of laboratory will be given in the second semester.

A study of the states of refraction of the eye, the correlated visual sensations, effects upon visual functions, optical methods of correction, and instruments used to detect and measure anomalous states of refraction.

103A–103B. Advanced Theoretical Optometry. (3–3) Yr. Mr. Morgan
Prerequisite: course 102A–102B.

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
Lecture and laboratory.

Lectures: history of the development of lenses and spectacles; the optical properties of different glasses; the theory of the design of spectacle lenses. Laboratory: lens surfacing, edging, beveling, mounting, neutralization, and frame fitting.

404A–404B. Practical Optometry. (3–3) Yr. Mr. Hobson
Prerequisite: courses 102A–102B and 401A–401B.

Lectures and problems dealing with physical eye examinations. A study of instruments and the techniques for their use, interpretation of examination data and prescribing of lenses, and orthoptic training.

406A–406B. Optometry Clinic. (2–2) Yr. Mr. Harrigan (in charge), Mr. Hebbard, Mr. Mason, Mr. Stoddard

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.

† 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.

- 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 139)

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.
Mr. Harrigan (in charge), Mr. Hobson, Mr. Elvin, Mr. Morgan
The examination and treatment, with lenses or orthoptic training, of patients with visual anomalies.
- 412A-412B. Advanced Clinical Procedures. (2-2) 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. (1-1) 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. (1-1) Yr. Mr. Drescher
An advanced consideration of topics covered in course 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. Walls
Prerequisite: for course 105A, Physics 108A-108B, Physiology 115; for course 105B, consent of the instructor.
Lectures on the physics, physiology, and psychology of vision.
105A: The visual pathways, the visual field, the pupil- and accommodative-mechanisms, the interaction between radiation and ocular tissue, the aberrations of the eye, illumination, and allied phenomena.
105B: The psychophysics and physiological psychology of light, form, and color senses, and the elements of visual perception.
- 106A-106B. Physiological Optics. (1-1) Yr. Mr. Hebbard, 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 139)

201A-201B. Seminar in Advanced Physiological Optics. (2-2) Yr.

Mr. Stoddard

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).

ORIENTAL LANGUAGES

Peter A. Boodberg, Ph.D., *Professor of Oriental Languages (Chairman of the Department)*.

Yuen Ren Chao, Ph.D., Litt.D., *Professor of Oriental Languages and Linguistics*.

Ferdinand D. Lessing, Ph.D., *Agassiz Professor of Oriental Languages, Emeritus*.

∇ Denzel Carr, Ph.D., *Associate Professor of Oriental Languages*.

Shih-Hsiang Chen, B.Litt., *Assistant Professor of Chinese*.

Mary R. Haas, Ph.D., *Assistant Professor of Siamese and Linguistics*.

Donald H. Shively, Ph.D., *Assistant Professor of Oriental Languages*.



Elizabeth Huff, Ph.D., *Lecturer in Oriental Languages*.

Ha Tai Kim, Ph.D., *Lecturer in Korean*.

Richard J. Miller, M.A., *Lecturer in Oriental Languages for the spring semester*.

Susumu W. Nakamura, M.A., *Lecturer in Japanese*.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: ——— (Chinese); Mr. Shively (Japanese).

Preparation for the Major.—

∇ On military leave, 1951-1952.

- Required: (a) Emphasis on Chinese—Courses 12A–12B, 13, 14, 17; or courses 12, 13, 14, 17.
 (b) Emphasis on Japanese—Courses 9A–9B (or 29A–29B), 13, 17, 39A–39B; or courses 9, 13, 17, 39.
 (c) Emphasis on Oriental Linguistics—One of the curricula in (a) or (b) above.

Recommended: English 25, History 19A–19B, Near Eastern Languages 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: courses 119A–119B, and 4 units from 129A–129B, 129C–129D, and 132 or 122.
 (b) Courses 137A–137B (or 134A–134B), 198.
 (c) 5 units selected from courses 100, 113, 117, 124, 133A–133B, 139, 191C–191D, 193.
 (2) With emphasis on Oriental Linguistics:
 (a) Courses 100, 117, 123 or 139, 135, 167, 177, 197A–197B, 198.
 (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.

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. (2–2) Yr. | Mr. Kim |
| 9. Elementary Modern Japanese. (6) I.
To be taken concurrently with course 17. | Mr. Shively, Mr. Miller |
| 12. Elementary Written Chinese. Intensive Course. (6) I and II.
To be taken concurrently with course 17. | Mr. Boodberg in charge |
| 12B. Elementary Written Chinese. (3) I.
Prerequisite: course 12A.
To be taken concurrently with course 13. | ——— in charge |
| 13. Classical Chinese. (2) I and II.
To be taken concurrently with course 12B, 14, or 39. | ———, Mr. Boodberg |
| 14. Intermediate Chinese. (6) II.
Prerequisite: courses 12 (or 12A–12B) and 17.
To be taken concurrently with course 13. | ——— in charge |
| 17. Introduction to the Study of Chinese Characters. (2) I and II.
To be taken concurrently with course 12 or 9. | Mr. Chen, Mr. Boodberg |
| 39. Intermediate Japanese. (6) I and II.
To be taken concurrently with course 13. | Mr. Shively, Mr. Nakamura |

LECTURE COURSES

- *32. Evolution of Japanese Civilization before 1868. (2) Mr. Carr
 *42. Chinese Civilization in the Asiatic Context. (2) Mr. Boodberg

UPPER DIVISION COURSES

100. Languages of Eastern Asia. (2) II. Mr. Boodberg
 A survey course on the nature and distribution of the main languages of Eastern Asia.
103. Chinese Narrative Prose. (3) I. _____
107. Intermediate Korean. (2) I and II. Mr. Kim
 May be repeated without duplication of credit.
- †108. Malay. (3) I and II. Mr. Boodberg
- *113. Chinese Classics. (3) _____
- †117. Logography and the Evolution of the Chinese Language and Script. (2) I. Mr. Boodberg
- *118. Introduction to Malayo-Polynesian Linguistics. (2) II. Mr. Carr
- 119A-119B. Advanced Modern Japanese. (3-3) Yr. Mr. Nakamura
123. Chinese Grammar. (3) I. Mr. Chao
124. Readings in Modern Chinese. (2) II. Mr. Chen
- 129A-129B. Classical and Medieval Japanese Literary Texts. (2-2) Yr.
 Prerequisite: course 119A-119B. Mr. Shively
- *129C-129D. Japanese Historical Texts and Kambun. (2-2) Yr.
 Prerequisite: course 119A-119B. Mr. Shively
- 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. Chao
- †137A-137B. Advanced Colloquial Chinese and Japanese. (2-2) Yr.
 Mr. Chao in charge
 An intensive course, open only to students majoring in Oriental Languages, to provide training in the active use of colloquial Chinese or Japanese. Five laboratory hours per week. In the second semester, one hour per week will be devoted to lectures in Chinese or Japanese on elements of Chinese and Japanese culture.
- *139. Japanese Grammar. (2) I. Mr. Carr
- †154. Mongolian. (2) I and II. Mr. Lessing
 May be repeated without duplication of credit.
- †164. Tibetan. (2) I and II. Mr. Lessing
 May be repeated without duplication of credit.

* Not to be given, 1951-1952.

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

167. Phonetics and Phonemics. (2) I. Miss Haas
Open to qualified language students and students of anthropology.
- *173A-173B. Chinese Philosophical Texts. (2-2) Yr. _____
- †174A-174B. Thai (Siamese). (3-3) Yr. Miss Haas
- †174C-174D. Readings in Thai. (2-2) Yr. Miss Haas
- *177. Types of Linguistic Structure. (2) II. Miss Haas
A rapid general survey followed by a more detailed presentation of selected Far Eastern and American Indian languages. Open to qualified language students and students of anthropology who have had course 167 or the equivalent.
178. American Indian Languages. (2) II. Miss Haas
- †187A-187B. Philological Laboratory. (2-2) Yr. The Staff
Prerequisite: junior standing.
Philological analysis of an Oriental language using textual material.
Subject for 1951-1952: Korean.
- 191A-191B. Masterpieces of Chinese Literature and Literary Criticism. (2-2) Yr. Mr. Chen
191A: Verse; 191B: Belles-lettres.
Recommended to be taken concurrently with course 112A-112B.
- *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. _____
- 197A-197B. Linguistics Laboratory. (3-3) Yr. Miss Haas
The technique of recording and analyzing a foreign language by working directly with a native speaker. An Oriental language will be used as model. Open to qualified language students and students of anthropology who have had courses 167 and 177. May be repeated without duplication of credit with consent of the instructor.
198. Special Study for Advanced Undergraduates and the Senior Essay. (1-2) I and II. Mr. Chen, Mr. Shively
Required of all majors in Oriental Languages.
199. Special Individual Study. (1-5) I and II. Miss Haas in charge

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.
- *122. Survey of Japanese Civilization. (3) I. Mr. Shively

* Not to be given, 1951-1952.

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

132. History of Japanese Literature. (3) I. Mr. Shively
From the beginning to modern times, emphasizing Chinese, Buddhist,
and Western influences.
- *142A-142B. Civilizations of Eastern Asia. (2-2) Yr. ———, Mr. Carr
Cultures of the higher civilizations, with special emphasis on the roles
of religion, mythology, and folklore.
142A. China, Tibet, Annam, Champa, Cambodia, Siam, Burma:
—————
142B. Japan, Korea, Siberia, Manchuria, Mongolia, Turkestan, Indo-
nesia: Mr. Carr.
151. Western and Chinese Travelers in Asia. (2) I. ———
152. Marco Polo's Asia. (2) II. ———
- *162A-162B. Chinese Thought and Culture from Han to Sui. (2-2) Yr. ———
- *172A-172B. Buddhism as a Cultural Factor in the Far East. (2-2) Yr.
Mr. Lessing
- *182. Life and Times of Confucius. (2) II. Mr. Boodberg
- *188. Philological Method: Languages and Literatures of Eastern Asia. (1) ———

GRADUATE COURSES

A reading knowledge of either French or German is prerequisite to the first year of graduate work; a reading knowledge of both French and German is prerequisite to the second year.

- *201A-201B. Buddhist Texts. (2-2) Yr. Mr. Lessing
- †207A-207B. Seminar in Descriptive Linguistics (Phonemics, Morphology, Syntax). (2-2) Yr. Miss Haas
- *208. Malayo-Polynesian Linguistics. (2) Mr. Carr
Prerequisite: course 108.
- 212A-212B. Seminar in Chinese Literary History. (2-2) Yr. Mr. Chen
Textual and Aesthetic Criticism.
- *213A-213B. Seminar in Philological Analysis of Chinese Sources of the Post-Han Period. (2-2) Yr. Mr. Boodberg
- 214A-214B. Tenth and Eleventh Century Texts: Sources for the Civilization of the Five Dynasties Period. (2-2) Yr. ———
- †227A-227B. Seminar in Historical Linguistics. (2-2) Yr. Miss Haas
- 229A. Proseminar in Bibliography and Methods in Japanese Studies. (2) I. Mr. Shively
- 229B. Seminar in Japanese Literature. (2) II. Mr. Shively
- 235A-235B. Seminar in Chinese Dialectology. (2-2) Yr. Mr. Chao

* Not to be given, 1951-1952.

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

- *237A-237B. Linguistic Methods in Teaching Oriental Languages. (2-2) Yr.
 Mr. Carr, Mr. Chao
 A seminar and practicum devoted to the development of teaching material in an Oriental language taught in the department.
- *239A-239B. Seminar in Japanese. (2-2) Yr. Mr. Carr
 250. Research. (1-4) I and II. Mr. Boodberg

PALEONTOLOGY

- Charles L. Camp, Ph.D., *Professor of Paleontology and Curator of Amphibians and Reptiles in the Museum of Paleontology.*
- * Ralph W. Chaney, Ph.D., *Professor of Paleontology and Curator of the Paleobotanical Collection in the Museum of Paleontology.*
- Ruben A. Stirton, Ph.D., *Professor of Paleontology (Chairman of the Department), Curator of Mammals and Director of the Museum of Paleontology.*
- J. Wyatt Durham, Ph.D., *Associate Professor of Paleontology and Curator of Invertebrate Collections in the Museum of Paleontology.*
- Robert M. Kleinpell, Ph.D., *Associate Professor of Paleontology and Curator of Micropaleontological Collections in the Museum of Paleontology.*
- Donald E. Savage, Ph.D., *Assistant Professor of Paleontology and Curator in the Museum of Paleontology.*



- Wann Langston, Jr., M.A., *Lecturer in Paleontology for the spring semester.*
- 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 69.

Departmental Major Adviser: Mr. Durham.

Preparation for the Major.—Two types of major programs are organized on the basis of relationships to geological sciences and to biological sciences.

Required: courses 1 (3) (or Geology 3 for transferring students) and 3 (3); Botany 1 (5) or Zoölogy 1A (4); Geology 1 (3); matriculation chemistry or physics. For the majors emphasizing geology, Engineering 1A-1B (3-3) and Mineralogy 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 152 (3) for I (b) and II (b) (see below); Botany 16 (3) for II (c) (see below). A reading knowledge of French and German is essential for efficient advanced work and is required of candidates for the Ph.D. degree.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the departmental major.

The Major:

I. Paleontology and Geological Sciences.

(a) Emphasis on invertebrate paleontology; courses 102 (3), 111 (4), 112 (4); Geology 102A-102B (2-2), 103 (3); and at least five additional units of

* In residence spring semester only, 1951-1952.

* Not to be given, 1951-1952.

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 (4) 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, Mr. Langston
 I: Mr. Stirton; II: Mr. Langston.
 Two lectures and laboratory 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 laboratory per week.
 Prerequisite: course 1, or Zoölogy 1A, or Geology 3, or Anthropology 1.
 The vertebrate skeleton, vertebrate evolution, principles of vertebrate paleontology.
- *10. Principles of Paleontology. (3) I. Mr. Chaney
 Two lectures and one demonstration section 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. _____
 Two lectures and laboratory 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. Durham
 (Formerly numbered 102A.)
 Two lectures and laboratory per week.
 Prerequisite: course 1, or Geology 1 and 3, or Zoölogy 1A. Paleobiology, morphology, and systematics of the invertebrates.

* Not to be given, 1951-1952.

112. Stratigraphic Paleontology. (4) II. Mr. Kleinpell
(Formerly numbered 104.)
Two lectures and laboratory per week.
Prerequisite: course 1 or Geology 3, and Zoölogy 1A or course 111.
Principles of biostratigraphy and correlation.
114. Micropaleontology. (4) I. Mr. Kleinpell
(Formerly numbered 105.)
Two lectures and laboratory per week.
Prerequisite: course 112.
Paleobiology, taxonomy, and biostratigraphy of the microfossils, with emphasis on the foraminifers.
- *116. Morphology and Phylogeny of the Paleozoic Invertebrates. (4) I.
Two lectures and laboratory 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 laboratory 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
Lectures and laboratory.
Prerequisite: any lower division course in botany or geology, or consent of the instructor.
121. Tertiary Floras of Western America. (3) II. Mr. Chaney
Lectures, proseminar, and laboratory.
Prerequisite: course 120.
125. History of the Lower Vertebrates. (3) I. Mr. Camp
(Formerly numbered 113.)
Lectures, proseminar, and laboratory.
Prerequisite: course 3 or Zoölogy 106.
126. Evolution and Classification of the Mammals. (4) I. Mr. Stirton
(Formerly numbered 114.)
Lectures, proseminar, and laboratory.
Prerequisite: course 3 or Zoölogy 106.
127. History and Paleoecology of Higher Vertebrates. (4) II. Mr. Savage
(Formerly numbered 115.)
Lectures, proseminar, and two three-hour laboratories.
Prerequisite: course 126.
- *136. Paleontology and Stratigraphy of the Paleozoic and Mesozoic. (5) I.
Two lectures and laboratory 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, 1951-1952.

137. Paleontology and Stratigraphy of the Late Mesozoic and Cenozoic. (5) I.
(Formerly numbered 103.) 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.
(Formerly numbered 109.) Mr. Kleinpell
Three lectures and laboratory 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 the instructor to enroll.
Review of discoveries and development of idea, 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 (Mr. Stirton in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- *252. Seminar in Stratigraphy. (2) II. _____
Current literature and general problems.
253. Seminar in Micropaleontology. (2) I and II. Mr. Kleinpell
(Formerly numbered 203).
Current literature and general problems.
254. Seminar in Mammalian Paleontology. (2) I and II.
(Formerly numbered 204.) Mr. Stirton, Mr. Savage
255. Seminar in Vertebrate Paleontology. (2) I and II. Mr. Camp
(Formerly numbered 205.)
256. Seminar in Invertebrate Paleontology. (2) I and II. Mr. Durham
(Formerly numbered 206.)
Current literature and general problems.
257. Seminar in Paleobotany. (2) II. Mr. Chaney
(Formerly numbered 207.)
Current literature and general problems.
290. Graduate Seminar. (No credit) I and II.
The Staff (Mr. Durham in charge)
Prerequisite: consent of the 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. (1-5) I and II.
(Formerly numbered 208.) The Staff (Mr. Stirton in charge)

* Not to be given, 1951-1952.

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.

PHILOSOPHY

George P. Adams, Ph.D., *Mills Professor of Mental and Moral Philosophy and Civil Polity.*

William R. Dennes, D.Phil., *Professor of Philosophy.*

Donald S. Mackay, Ph.D., *Professor of Philosophy (Chairman of the Department).*

Paul Marhenke, Ph.D., *Professor of Philosophy.*

Stephen C. Pepper, Ph.D., *Professor of Philosophy and Aesthetics.*

Edward W. Strong, Ph.D., *Professor of Philosophy.*

Karl Aschenbrenner, Ph.D., *Assistant Professor of Philosophy.*

Benson Mates, Ph.D., *Assistant Professor of Philosophy.*

Fundamental ideas and ideals play an indispensable part in the life and activities of each culture area and epoch. They reflect the manner in which each age organizes its knowledge and the major interests of its civilization. They disclose the problems generated by the impact of traditional habits of life and thought upon the requirements imposed by new conditions and by fresh discoveries of knowledge. They portray the efforts of reflective thought to formulate more adequate concepts and ideals for the organization and interpretation of experience.

Courses offered by the Department of Philosophy provide an opportunity for the student to become acquainted with the leading ideas in terms of which men attempt at the present time to understand the broader fundamental aspects of their world and their civilization.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: Mr. Mates.

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 COURSE

6A–6B. Introduction to Philosophy. (3–3) Yr. Beginning each semester.

Mr. Adams, Mr. Aschenbrenner, Mr. Mackay, Mr. Mates,
Mr. Pepper, Mr. Strong

Weekly section meetings for discussion and written work.

Course 6A is prerequisite to 6B. Two sections in 6A will be given in the spring semester and two sections of 6B in the fall semester.

SOPHOMORE COURSES

- 12A-12B. Logic. (3-3) Yr. Mr. Marhenke, Mr. Mates
- 20A-20B. History of Philosophy. (3-3) Yr. Mr. Dennes, Mr. Mackay
 I. From the Pre-Socratics to Plotinus.
 II. From the Scholastics to Kant.
30. Scientific Method. (3) II. Mr. Marhenke

UPPER DIVISION COURSES

General Prerequisites.—Students enrolling in any upper division course must have completed 6 units in course 6A-6B or 20A-20B.

GROUP A

Courses concerned with a critical analysis and appraisal of specific human interests such as art, literature, morality, religion, science, and society.

104. Ethics. (3) I. Mr. Adams
 Moral Values: An analysis of the Good and the Right.
- *108. Social Philosophy. (3) II. Mr. Dennes
 An examination of the fundamental notions involved (a) in the explanation, and (b) in the evaluation, of social structures and processes. Basic problems of human personality and values in relation to their social matrix.
- *112. Philosophy of Religion. (3) II. Mr. Adams
 The nature and the validity of religious ideas.
128. Political Philosophy. (2) I. Mr. Mackay
 Conceptions of the State in relation to the values of freedom and social order; the idea of constitutional democracy in its historical development.
- 136A-136B. Aesthetics. (3-3) 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. Aschenbrenner
 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. _____
 At the discretion of the instructor the general prerequisite may be waived for major students in literature or in the fine arts.

GROUP B

Courses dealing with the methods of reflective thinking and the more general features of experience.

102. Recurrent Types of Philosophy. (3) II. _____

* Not to be given, 1951-1952.

- *111. Metaphysics. (3) _____
113. Logic. (3) II. Mr. Marhenke
Prerequisite: course 12A or its equivalent.
- *114. Theory of Knowledge. (3) I. Mr. Marhenke
- *122. Philosophy of Mind. (3) I. Mr. Adams
123. Man and Nature. (3) II. Mr. Adams
A critical survey of ideas concerning the relation between man and nature, within the western tradition.
124. Philosophy of Science. (3) I. Mr. Marhenke
125. Theory of Value. (3) II. Mr. Pepper
Enrollment limited to twenty-five students.
A study of the sources of value with particular emphasis on purposive behavior, and on principles of evaluation in relation to both individual and social problems.
133. Philosophy of Language. (3) I. Mr. Mates
Prerequisite: six units in 6A-6B or 20A-20B; and 12A.
- *135A-135B. Contemporary Tendencies in Philosophy. (3-3) Yr. Mr. Mates
147. Theory of Historical Inquiry. (3) I. Mr. Strong
- Mathematical Logic. (Mathematics 109A). (3) I. Mr. Mates

GROUP C

Courses dealing with individual thinkers and epochs in the history of ideas. Course 20A-20B or its equivalent is prerequisite to courses in this group.

- *103. Philosophy of the Nineteenth Century. (3) I. Mr. Mackay
105. Kant. (3) I. _____
115. Medieval and Early-Modern Thought. (3) II. Mr. Strong
116. Plato. (3) II. Mr. Mackay
- *117. Aristotle. (3) I. Mr. Dennes
118. Spinoza. (3) II. Mr. Mackay
- 119A-119B. British Empiricism. (3-3) Yr. Mr. Aschenbrenner, Mr. Mates
(Formerly numbered 119.)
119A. With special reference to Locke and Berkeley.
119B. With special reference to Hume.
- *121. Hobbes. (3) I. _____
- *126. Hellenistic Philosophy: The Stoics, Epicureans, and Skeptics. (3) I. Mr. Mates
- *129. Leibniz. (3) I. Mr. Marhenke
- *130. Materialism and Naturalism. (3) II. Mr. Strong
Historical and critical studies of the chief philosophical materialists from Democritus to Dewey.

* Not to be given, 1951-1952.

145. American Philosophy. (3) II. Mr. Aschenbrenner

199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Mackay in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

204. Seminar in Ethics. (2) I. Mr. Adams

210A-210B. Seminar in Hegel's Phenomenology of Mind. (2-2) Yr. ———

211. Seminar in Metaphysics. (2) II. Mr. Adams

213A-213B. Seminar in Logic. (2-2) Yr. Mr. Marhenke

*214. Seminar in the Theory of Knowledge. (2) II. Mr. Marhenke

*216. Seminar in Plato. (2) I. Mr. Mackay

*218A-218B. Seminar in Semantics. (2-2) Yr. Mr. Mates

*220. Seminar in Pragmatism. (2) I. Mr. Mackay

221. Metaphysics and Philosophical Analysis. (2) I. Mr. Aschenbrenner

*225. Seminar: Theory of Value. (2) II. Mr. Pepper

231. Seminar in the Problem of Time. (2) I. Mr. Mackay

232. Seminar in Philosophical Naturalism. (2) II. Mr. Dennes

236. Aesthetics from the Metaphysical Standpoint. (2) II. Mr. Pepper
A special study will be made of the principles of criticism in the arts.

*237. Seminar in the Philosophy of Art. (2) ———

*238. Seminar in Aesthetics. (2) I. Mr. Aschenbrenner

247. Seminar in Theories of History. (2) II. Mr. Strong

250. Special Studies. (1-6) I and II. The Staff (Mr. Mackay in charge)
Enrollment is ordinarily restricted to students who have been admitted to candidacy for the doctor's degree.

PHYSICAL EDUCATION

Frederick W. Cozens, Ph.D., *Professor of Physical Education and Director of Physical Education (Chairman of the Department)*.

Anna Espenschade, Ph.D., *Professor of Physical Education*.

† Pauline Hodgson, Ph.D., *Professor of Physical Education*.

Sarah R. Davis, A.B., *Assistant Professor of Physical Education, Emeritus*.

Franklin M. Henry, Ph.D., *Associate Professor of Physical Education*.

Louise S. Cobb, Ph.D., *Supervisor of Physical Education*.

Henry A. Stone, M.S., *Supervisor of Physical Education*.

Lucile K. Czarnowski, M.S., *Associate Supervisor of Physical Education*.

Marie H. Glass, A.B., *Associate Supervisor of Physical Education*.

Jack E. Hewitt, Ed.D., *Associate Supervisor of Physical Education*.

* Not to be given, 1951-1952.

† Miss Hodgson will serve as executive officer in the Division for Women.

Ralfe D. Miller, M.A., *Associate Supervisor of Physical Education.*
 Heber A. Newsom, M.A., *Associate Supervisor of Physical Education.*
 Charles A. Pease, A.B., *Associate Supervisor of Physical Education.*
 Eleanor E. Bartlett, A.B., *Assistant Supervisor of Physical Education.*
 Frederica Bernhard, M.S., *Assistant Supervisor of Physical Education.*
 Caroline W. Coleman, M.A., *Assistant Supervisor of Physical Education.*
 Lance Flanagan, M.A., *Assistant Supervisor of Physical Education.*
 Katharine Gilcoyne, M.A., *Assistant Supervisor of Physical Education.*
 Charles J. Keeney, A.B., *Assistant Supervisor of Physical Education.*
 Edgar Nemir, A.B., LL.B., *Assistant Supervisor of Physical Education.*
 Jane E. Hartmann, B.S., *Junior Supervisor of Physical Education.*
 Margaret Ann Iden, M.S., *Junior Supervisor of Physical Education.*
 Harold Hugh Mumby, A.B., *Junior Supervisor of Physical Education.*
 Ruth E. Van Denbergh, M.S., *Junior Supervisor of Physical Education.*



Clinton W. Evans, B.S., *Lecturer in Physical Education.*
 Lynn O. Waldorf, A.B., *Lecturer in Physical Education.*

The incidental fee payable by all students at the time of registration entitles students to the use of gymnasias, swimming pools, showers, towels, lockers, tennis courts, and the athletic fields, also to the use of costumes for certain physical education activities, including swimming.

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

Fees.—The fee for ice skating is \$4.50.

Fines.—Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulations of the department: (a) Failure to return equipment or clothing on or before the date posted for such return at the end of each semester, or at the end of each special session of the University, or failure to return athletic supplies (balls, bats, etc.) on the date of issue, \$1 for each twenty-four hours until the full purchase price of the article has been reached. (b) Failure to meet the appointment for the physical examination, \$2. (c) Overnight use of dressing locker, \$2. Failure to empty locker within designated time, \$2.

LOWER DIVISION COURSE FOR MEN

1. Physical Training, Recreation, and Competitive Sports. (½) I and II.

Sections meet twice weekly at various hours, M Tu W Th. The Staff Men may enroll for credit in class instruction, in intramural or inter-collegiate athletics. The following activities are open to those found properly qualified: archery†, baseball, softball baseball, basketball, boxing, wrestling, fencing, crew, American football, touch football, rugby football, golf, gymnastics, body building, tumbling, handball, squash, figure skating†, badminton, hockey, soccer, swimming, diving, tennis, track, modern dance†, folk dancing†, social dancing†, trampoline, volleyball, and weight-lifting. Special guidance and facilities are provided for men wishing to correct bodily defects or accomplish specific development.

† See Lower Division Courses for Men and Women.

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. (½) I and II. The Staff
 Sections meet twice weekly at various hours.
 The following activities are offered in elementary, intermediate, and advanced grades for women who are in good physical condition.
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.

LOWER DIVISION COURSES FOR MEN AND WOMEN

20. Introduction to Physical Education. (1) I and II. Mr. Cozens, Miss Hodgson
 An interpretation of the field designed to give the prospective major student an understanding of its scope.
26. Physical Education Activities. (½) I and II. The Staff
 Sections meet twice weekly at various hours.
 Archery, folk dancing, figure skating, modern dance, social dancing.
54. Rhythmic Basis of Dance and Allied Arts. (2) II. Miss Czarnowski
 (Formerly numbered 35.)
 This course is planned for students interested in dance, music, and art. Consideration given to nature and function of rhythm, rhythmic analysis and notation, rhythmic form in the temporal and spatial arts.
- 85A. First Aid. (1) I and II. The Staff
 (Formerly numbered 5A.)
 Standard course. Sections meet two hours per week.
 Upon successful completion of the course, the Red Cross Certificate is awarded.
- 85B. Advanced First Aid. (No credit) I. Miss Coleman
 (Formerly numbered 5B.)
 Sections meet two hours per week for eight weeks.
 Upon successful completion of the course, the Red Cross Certificate is awarded.

UPPER DIVISION COURSE FOR MEN

171. Conditioning of Athletes and Care of Injuries. (2) I. Mr. Stone
 (Formerly numbered 318.)
 Lecture and a three-hour laboratory period per week.
 Prerequisite: course 85A, Physiology 1 or Anatomy 102.
 Modern principles and practice in conditioning and care of athletes; individual variation and needs as to sleep, diet, health, and activity habits; care of injuries with special emphasis on therapy, taping, and protective equipment.

† See Lower Division Courses for Men and Women.

UPPER DIVISION COURSES FOR WOMEN

- †160A-160B. Theory of Dance. (3-3) Yr. Miss Czarnowski
Lectures and laboratory.
Prerequisite: course 54 and Psychology 1A.
- 165A. Theory of Group Athletics. (3) I. Miss Espenschade, Miss Hodgson, Miss Gilcoyne
Lectures and laboratory.
Recommended: course 101.
- 165B. Theory of Gymnastics. (2) II. 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 movements in various physical education activities. Description and application of certain anatomical concepts and physical laws to joint and muscular action. An analysis of certain deviations from physical growth norms.
- †102. Corrective Physical Education. (3) II. Miss Bartlett
Prerequisite: course 101.
Development of programs for those individuals whom the physician has diagnosed as functionally deficient; particular attention to poor circulation, spinal deviations, etc. Analysis of causes underlying these conditions and direction of students into activities suitable to their needs.
105. Physiological Hygiene. (4) II. Mr. Henry
Lectures and laboratory.
Prerequisite: high school chemistry, Home Economics 10, Physiology 1, 1L, Public Health 5A.
The physiology of exercise; diet, ventilation, training, fatigue, and health in relation to physical activity. Individual differences in cardiovascular and respiratory function.
110. Psychologic Bases of Physical Activity. (2) I. Miss Espenschade
Prerequisite: Psychology 1A.
Motor learning, facilitation and inhibition, motivation, set, reaction time, coördination efficiency, fatigue, emotion, and personality in relation to physical activity; the psychology of athletic performance.
130. History and Principles of Physical Education. (3) II. Miss Cobb
Prerequisite: course 20, Physiology 1, 1L, and Psychology 1A.
- 131A-131B. The Organization and Administration of Physical Education. (2-2) Yr. Mr. Cozens, Miss Hodgson, Mr. Stone
131A. Mr. Cozens.
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

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

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. Mr. Cozens
Prerequisite: Education 110 or consent of the instructor.
The historical background of measurement in physical education; statistical techniques to be used in scoring tests; the construction and uses of tests; interpretation of results; evaluation of measures now available in the field; the administration of a testing program.
140. Community Recreation. (2) I. Miss Cobb
Prerequisite: upper division standing.
The meaning and scope of recreation in the leisure-time life of the American people. Purposes and programs of agencies concerned with recreation. Consideration of special types: industrial, commercial, home, and neighborhood. Problems of leadership. Critical evaluation of representative surveys.
Course 140 is not open to students who have taken course 143A or 143B; and the latter are not open for full credit to students who have taken course 140.
- 143A. Theory and Principles of Recreation. (3) I. 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.
Prerequisite: course 143A. Mr. Miller
Community interrelationships affecting recreation; the recreation program; areas and facilities and their operation, recreation organization; financial support, records, personnel administration, publicity, and public relations.
- 144A. Field Laboratory Course. (No credit) Mrs. Glass
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. Cozens in charge)
Prerequisite: senior standing and consent of the department. Only specially qualified students will be admitted.

METHODS COURSES FOR MEN

- 301A. The Theory and Teaching of Gymnastics and Mass Athletics.
(1) I and II. Mr. Pease
One lecture and two laboratory hours to be arranged.
Prerequisite: course 1 in body building.
303. The Theory and Teaching of Track and Field Events. (1) I.
One lecture and two laboratory hours to be arranged. Mr. Keeney

304. The Theory and Teaching of Baseball. (1) II. Mr. Evans
One lecture and two laboratory hours to be arranged.
305. The Theory and Teaching of Basketball. (1) I. Mr. Newsom
One lecture and two laboratory hours to be arranged.
Prerequisite: course 1 in basketball.
306. The Theory and Teaching of Court Sports. (1) I. Mr. Miller
One lecture and two laboratory hours to be arranged.
Prerequisite: course 1 in tennis or consent of the instructor.
308. The Theory and Teaching of Boxing and Wrestling. (1) I and II.
Prerequisite: course 1 in boxing and wrestling. Mr. Stone, Mr. Nemir
310. The Theory and Teaching of Swimming, Diving, and Water Polo. (1)
I and II. Mr. Flanagan, Mr. Hewitt
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.
One lecture and two laboratory hours to be arranged. Mr. Hewitt
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 the instructor.

METHODS COURSE 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.

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.
One lecture and two laboratory hours per week. Mrs. Glass
Prerequisite: qualification for advanced swimming or consent of the
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.

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

GRADUATE COURSES FOR MEN AND WOMEN

- †231. Administration of Physical Education. (2) II. Mr. Cozens
- 260A-260B. Seminar in Physical Education. (2-2) Yr. Beginning each semester. Mr. Cozens, Miss Espenschade, Miss Hodgson, Mr. Henry
The meaning, methods, and techniques of research procedure as applied to physical education; a critical review of selected studies, literature, practices and procedures in the field; application of this training to a particular problem in the field.
Two sections of 260B will be offered each semester.
290. Research. (1-6) I and II.
Mr. Cozens, Miss Espenschade, Mr. Henry, Miss Hodgson

PHYSICS

- Luis W. Alvarez, Ph.D., *Professor of Physics.*
Raymond T. Birge, Ph.D., *Professor of Physics (Chairman of the Department).*
- * Robert B. Brode, Ph.D., *Professor of Physics.*
August C. Helmholtz, Ph.D., *Professor of Physics.*
Francis A. Jenkins, Ph.D., *Professor of Physics.*
Charles Kittel, Ph.D., *Professor of Physics.*
Ernest O. Lawrence, Ph.D., Se.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.*
Wilson M. Powell, Ph.D., *Professor of Physics.*
- ² Emilio Segrè, Ph.D., *Professor of Physics.*
Robert L. Thornton, Ph.D., *Professor of Physics.*
Harvey E. White, Ph.D., *Professor of Physics.*
Ralph S. Minor, Ph.D., *Professor of Physics and Optometry, Emeritus.*
William H. Williams, Graduate, United States Military Academy, *Professor of Physics, Emeritus.*
Hiram W. Edwards, Ph.D., *Associate Professor of Physics.*
William B. Fretter, Ph.D., *Associate Professor of Physics.*
Burton J. Moyer, Ph.D., *Associate Professor of Physics.*
William A. Nierenberg, Ph.D., *Associate Professor of Physics.*
Owen Chamberlain, Ph.D., *Assistant Professor of Physics.*
Arthur F. Kip, Ph.D., *Assistant Professor of Physics.*
Walter D. Knight, Jr., Ph.D., *Assistant Professor of Physics.*
Theodore C. Merkle, Jr., Ph.D., *Assistant Professor of Physics.*
John H. Reynolds, Ph.D., *Assistant Professor of Physics.*
Chaim Richman, Ph.D., *Assistant Professor of Physics.*
Henry Silsbee, Ph.D., *Assistant Professor of Physics.*
Herbert F. York, Jr., Ph.D., *Assistant Professor of Physics.*

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

* Absent on leave, 1951-1952.

² In residence spring semester only, 1951-1952.

Roland H. Good, Jr., Ph.D., *Instructor in Physics.*

Robert J. Riddell, Jr., Ph.D., *Instructor in Physics.*



Norris E. Bradbury, Ph.D., *Professor of Physics, Los Alamos Laboratory.*

Theos J. Thompson, M.S., *Lecturer in Physics.*

Alfred von Engel, Dr. Ing., *Visiting Professor of Physics.*

MEDICAL PHYSICS

Joseph G. Hamilton, M.D., *Professor of Medical Physics, Experimental Medicine and Radiology, and Director of the Crocker 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.*

Hardin B. Jones, Ph.D., *Associate Professor of Medical Physics and Physiology and Assistant Director of the Donner Laboratory.*

Cornelius A. Tobias, Ph.D., *Associate Professor of Medical Physics.*

Kenneth Scott, Ph.D., *Assistant Professor of Experimental Radiology.*

Nathaniel I. Berlin, M.D., Ph.D., *Lecturer in Medical Physics.*

R. Lowry Dobson, M.D., Ph.D., *Lecturer in Medical Physics.*

Rex L. Huff, M.D., *Lecturer in Medical Physics.*

Letters and Science List.—All undergraduate courses in physics except 131 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Advisers: Mr. Helmholtz, Mr. Merkle.

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. 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 page 93.)

Honors.—Honor students may do special work in course 199. Other special courses will not be given.

LOWER DIVISION COURSES

Courses 4A, 4B, 4C are fundamental and are designed to meet the needs of students whose major is physics and of students preparing for applications of physics in the Colleges of Engineering and Chemistry. After completing 4A, the order of taking 4B, 4C is immaterial.

Prerequisite for all lower division courses except course 10: (1) either high school physics or chemistry or Physics 10, (2) trigonometry (may be taken concurrently). Prerequisite for course 10: elementary algebra and plane geometry.

2A-2B. General Physics Lectures. (3-3) Yr. Beginning each semester.

————, Mr. Thompson, Mr. White
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. Thompson

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. Lenzen, Mr. Reynolds, Mr. York

Three lectures and one three-hour laboratory period per week.

Prerequisite: Mathematics 3A-3B or its equivalent. Mathematics 3B may be taken concurrently.

Open to students in all colleges. Together with course 4B-4C, required for students in the College of Letters and Science whose major subject is physics, and for students in engineering and chemistry.

Mechanics, properties of matter.

4B. General Physics. (4) I and II. Mr. Kip, Mr. Loeb, Mr. Merkle

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. Kip, Mr. Knight, Mr. Merkle

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.

Heat, wave motion, sound, and light.

10. Descriptive Introduction to Physics. (3) II. Mr. White

A brief presentation of some of the more important phenomena in physics, with experimental illustrations. Open to students with or without high school physics, but not open to those who have had 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, Electrical, 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. Lenzen, Mr. Reynolds, Mr. York

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. Kip, Mr. Knight, Mr. Merkle

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. Kip, Mr. Knight, Mr. Merkle

Equivalent to part of 4C. Students enrolled under 41D will attend the lectures and laboratory of 4C, but will be held only for the portion of that course covering wave motion, sound, and light (formerly included in course 1D).

UPPER DIVISION COURSES

Courses 4A, 4B, 4C and differential and integral calculus are prerequisite to all upper division courses except course 108A-108B, Sec. 2.

104A-104B. Vector Analysis. (3-3) Yr.

Mr. Good, ———

104A. I: Mr. Good; II: ———.

104B. II: Mr. Good.

Elements of vector and tensor analysis and their applications to physics, particularly those branches in which the idea of a field is fundamental. Emphasis on the importance of an invariantive formulation of physical laws.

105A-105B. Analytic Mechanics. (3-3) Yr. Beginning each semester.

Mr. Chamberlain, Mr. Moyer, Mr. Silsbee

105A. I: Mr. Chamberlain; II: Mr. Silsbee.

105B. I: Mr. Moyer; 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

Lectures and laboratory.

Prerequisite: courses 2A-2B, 3A-3B.

Geometrical methods applied to the optics of mirrors, prisms, and lenses.

108B. Physical Optics. (3) I and II.

Mr. Jenkins, ———, ———

Lectures, I: Sec. 1, Mr. Jenkins; II: Sec. 1, ———; Sec. 2, ———.

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. Knight, Mr. Powell, Mr. Thornton
- 110A. I: Mr. Knight; II: Mr. Powell; 110B. I: Mr. Thornton; II: Mr. Knight.
- 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. (1) I and II.
Mr. Chamberlain, Mr. Silsbee
- The use and calibration of precision electrical instruments and electronic devices.
- 110D. Modern Physics Laboratory. (1) I and II.
Prerequisite: course 121. Mr. Chamberlain, Mr. Silsbee
- The experimental foundation for the theory of atomic structure.
112. Heat. (3) I and II. Mr. Loeb, Mr. Reynolds
- I: Mr. Reynolds; II: Mr. Loeb.
- The thermal properties of matter, with an introduction to the mathematical theory of heat conduction, the kinetic theory of matter, and thermodynamics.
114. Sound. (2) I. _____
- Theory of vibrations and wave motion, with applications to acoustics.
115. Introduction to Quantum Mechanics. (3) I and II.
Mr. Chamberlain, Mr. McMillan
- I: Mr. McMillan; II: Mr. Chamberlain.
- 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.
I: Mr. Merkle; II: Mr. Thornton. Mr. Merkle, Mr. Thornton
- An introduction to atomic physics treating cathode and positive rays, the electron, thermionic emission, the photoelectric effect, the structure of the atom, and the interpretation of spectra and X rays.
122. Discharge Through Gases. (3) II. Mr. Loeb
- Currents in gases, nature and property of ions, ionization by collision, spark, arc, and glow discharges.
124. Radioactivity and Nuclear Structure. (3) I and II.
I: Mr. York; II: Mr. Segrè. Mr. Segrè, Mr. York
- Prerequisite: course 121.
- Discovery of radioactivity, nature of radioactivity, α , β , and γ rays, theory of successive transformation, artificial transmutations, nuclear structure.
125. Introduction to Medical Physics. (1) I.
- The Staff (Mr. Gofman in charge)
- Application of recent advances in nuclear physics to biological and medical problems.

126. Biological Applications of Artificial Radioactivity. (2) II.
Mr. Hamilton, Mr. Scott
Prerequisite: course 2A-2B, Chemistry 1A-1B, and one of the following: Zoölogy 1A-1B, Physiology 1, 1L, or Botany 1.
The theory and methods used in the applications of artificial radioelements to research problems in the biological sciences.
- 126L. Biological Applications of Artificial Radioactivity. (1) II.
Laboratory work to accompany course 126. Mr. Hamilton, Mr. Scott
128. Measurement of Radiations. (1) I. Mr. Tobias
Prerequisite: courses 2A-2B, 3A-3B, or equivalent and consent of the instructor.
An introduction to the measurement of nuclear radiations and the interaction of radiations with matter. Special attention is given to biological methods and dosimetry.
- 128L. Measurement of Radiations. (2) I. Mr. Tobias
Prerequisite: courses 2A-2B, 3A-3B, or equivalent and consent of the instructor.
Laboratory work to accompany course 128.
- 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. Electron Theory of Metals and Solid State Physics. (3) II. Mr. Kittel
Prerequisite: course 121 and Mathematics 110A-110B.
A basic introductory course on the electron theory of metals, the structure of crystals and of semiconductors, including mechanical, electrical and magnetic properties of the solid state.
131. Biological Effects of Radiation. (2) II. Mr. Dobson
Two three-hour laboratory sections per week.
Prerequisite: courses 128-128L, or 124 or equivalent, and one of the following: Physiology 108, Zoölogy 1A-1B, Bacteriology laboratory, or equivalent, and consent of the 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.
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 139)

- 204A-204B. The Reduction of Observations. (2-2) Yr. Mr. Birge
Instruments and methods, analytical and graphical, employed in reduction of data to final results, and errors of the results—including numerical interpolation and integration, theory of least squares, theory of errors.
- 205A. Advanced Dynamics. (3) I. Mr. Lenzen
Prerequisite: course 105A-105B.
The generalized methods of Lagrange, Hamilton, and Jacobi.

- 205B. Advanced Dynamics. (3) II. Mr. Lenzen
Prerequisite: course 105A-105B or equivalent. Course 205A is not prerequisite to 205B.
Theory of elasticity and hydrodynamics.
- 208A-208B. Advanced Physical Optics. (2-2) Yr. Mr. 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. Helmholtz, Mr. Richman
210A. I: Mr. Helmholtz; II: Mr. Richman.
210B. I: Mr. Richman; II: Mr. Helmholtz.
Prerequisite: course 110A-110B and a working knowledge of differential equations.
Classical description of the electromagnetic field, including special relativity and electron theory.
- 211A. Spectroscopy and Atomic Structure. (3) II. Mr. Jenkins
Prerequisite: courses 108B and 121.
A summary of the applications of optical and X-ray spectra to the investigation of the structure of atoms, diatomic molecules, and nuclei.
212. Thermodynamics. (3) I and II. Mr. Kip, Mr. Silsbee
I: Mr. Silsbee; II: Mr. Kip.
The principles of thermodynamics, based upon the first and second laws. The thermodynamic investigation of the equilibrium states of various physical systems. Applications to radiation. A brief discussion of the so-called third law.
219. Kinetic Theory. (3) I and II. Mr. Kittel, Mr. Lenzen
I: Mr. Kittel; II: Mr. Lenzen.
Classical kinetic theory and its explanation of the properties of matter. Introduction to statistical mechanics and the statistical interpretation of thermodynamics. Modification of the classical treatment by quantum theory. Bose-Einstein and Fermi-Dirac statistics.
- 221A-221B. Theoretical Atomic Physics. (3-3) Yr. Mr. Nierenberg
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. _____
The setting up and solution of differential and integro-differential equations; statistical and algebraic methods for the treatment of problems of physics.
- 223A-223B. Advanced Theoretical Physics. (3-3) Yr. Mr. Riddell
Systematic development of methods of quantum mechanics, electromagnetics, and statistical mechanics; methods of group theory in atomic problems; field theories.
224. Nuclear Physics. (3) II. Mr. McMillan
Prerequisite: a knowledge of the elements of quantum mechanics.
The structure of the nucleus. Spontaneous nuclear transformations and radiations accompanying them. Induced nuclear reaction. Neutron physics.

* Not to be given, 1951-1952.

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.
230. Electrodynamics. (3) II. _____
Prerequisite: course 210A-210B.
Electrodynamics, radiation, and relativity.
- 231A-231B. Advanced Atomic and Nuclear Physics. (3-3) Yr. _____
Prerequisite: courses 121, 124, and a working knowledge of differential equations. Recommended: Chemistry 123.
Problems of atomic and nuclear physics, including an introduction to quantum mechanics; modern theories and recent experimental advances. Primarily for other than Ph.D. degree candidates in physics.
- 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 1951-1952 will probably include seminars in (a) Theoretical Physics (I and II, Good and Riddell); (b) Cosmic Rays (I and II, Fretter); (c) Discharge through Gases (I and II, Loeb and von Engel); (d) Spectroscopy (I and II, Jenkins and White); (e) Nuclear Physics (I and II, Helmholtz and York); (f) Atomic and Molecular Beams (I and II, Nierenberg and Silsbee); (g) Biological Effects of Radiation (II, Dobson and Tobias); (h) Theory of Turnover (I, Gofman); (i) Biophysics of Large Molecules (I and II, Gofman); (j) Biophysics of Growth (I, Dobson and Tobias); (k) Solid State Theory (I and II, Kittel and Kip).
295. Research. (1-6) I and II. _____ The Staff (Mr. Birge in charge)
299. Research: Medical Physics. (1-6) I and II. _____
The Staff (Mr. Jones in charge)

RELATED COURSES IN OTHER DEPARTMENTS

- The Theory of Waves in an Elastic Medium. (See Geology 204.)
- Advanced Seismometry. (See Geology 217.)
- Physiological Effects of Radiation. (See Physiology 108.)
- Physical Biochemistry. (See Biochemistry 206A-206B.)

PHYSIOLOGY

A Division of the School of Medicine

Leslie L. Bennett, M.D., Ph.D., *Professor of Physiology.*

I. Lyon Chaikoff, M.D., Ph.D., *Professor of Physiology.*

Sherburne F. Cook, Ph.D., *Professor of Physiology and Lecturer in Optometry.*

James M. D. Olmsted, Ph.D., Sc.D., *Professor of Physiology (Chairman of the Division).*

Hardin B. Jones, Ph.D., *Associate Professor of Physiology and Medical Physics.*

Nello Pace, Ph.D., *Associate Professor of Physiology.*

Benjamin Libet, Ph.D., *Assistant Professor of Physiology.*



Spencer W. Brown, Ph.D., *Assistant Professor of Genetics.*

Ellsworth C. Dougherty, Ph.D., M.D., *Lecturer in Physiology.*

Harold T. Gordon, Ph.D., *Lecturer in Physiology and Assistant Professor of Entomology.*

Gordon L. Walls, Sc.D., *Lecturer in Physiology and Associate Professor of Physiological Optics and Optometry.*

Letters and Science List.—All undergraduate courses in physiology are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: Mr. Olmsted.

Preparation for the Major.—Required: course 1-1L (5) or Zoölogy 1A-1B (8); Physics 2A-2B (6); Chemistry 1A-1B (10); 5 (3), 8 (3); Mathematics 3A-3B or 11A-11B 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 chairman.

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
(Formerly numbered 1A.)
Prerequisite: either high school chemistry or at least 4 units of college physics or biology. Not open to entering freshmen.
Preference will be given to those students for whom the course is required.
- 1L. Introductory Physiology. Laboratory. (2) I. Mr. Cook
(Formerly numbered 1C.)
Prerequisite: course 1 (may be taken concurrently).
Each laboratory section will be limited to ninety students. Preference will be given to those for whose major the course is required.

UPPER DIVISION COURSES

- 100A-100B. General Physiology. (3-3) Yr. Mr. Pace
 Prerequisite: Chemistry 1A-1B, 8; Physics 2A-2B; course 1-1L, or Zoölogy 1A-1B, or Botany 1. Recommended: Mathematics 11A-11B, or 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. Olmsted, Mr. Chaikoff, Mr. Bennett, 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. ———
 Prerequisite: course 1, or Zoölogy 1A-1B, or the equivalent.
 Lectures on the physiological changes taking place during development of the child, including those occurring *in utero*, at birth, during growth, and at puberty. The influence of heredity, congenital defects, nutrition, and other factors on growth and development will also be discussed.
104. Physiology of the Endocrines. (2) I. Mr. Chaikoff
 Prerequisite: course 1-1L or Zoölogy 1A-1B, or consent of the instructor. Not open to students who have taken course 110B.
106. History of Human Physiology. (2) I. Mr. Olmsted
 Lectures and reports.
 Prerequisite: upper division standing and a laboratory course in one of the following: physiology, biochemistry, anatomy, zoölogy.
107. Environmental Physiology. (3) II. Mr. Pace, Mr. Cook
 Prerequisite: course 1, or Zoölogy 1A-1B, or consent of the instructor.
 Lectures on the physical, chemical, and biotic influences of the environment on man, and the adaptive changes in response to environment.
108. Radiation Physiology. (3) II. Mr. Jones
 Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1-1L, or Zoölogy 1A-1B.
 Lectures on the physiological effects of radiation.
- 110A-110B. Mammalian Physiology. (3-3) Yr. Mr. Olmsted, Mr. Chaikoff, Mr. Bennett
 Prerequisite: course 1-1L or Zoölogy 1A-1B, Physics 2A-2B, Chemistry 1A, 8. Zoölogy 1A may be substituted for course 1-1L with consent of the instructor.
 A comprehensive survey of mammalian physiology.
112. Mammalian Physiology. Laboratory. (3) II. Mr. Olmsted, Mr. Chaikoff, Mr. Bennett, and Assistants
 Prerequisite: course 110A-110B (may be taken concurrently).
 Course 112 covers the laboratory work of course 101M and is limited to fifty students.
115. Morphology and Physiology of the Visual System. (4) I. Mr. Walls, Mr. Cook
 Lectures and laboratory.
 Prerequisite: course 1-1L or Zoölogy 1A.
 Open to students in the School of Optometry and to others with consent of the 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. Olmsted in charge, Mr. Bennett,
Mr. Chaikoff, Mr. Cook, Mr. Pace
Prerequisite: at least 6 units of upper division courses in physiology.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

- 201A-201B. Research. (2-8; 2-8) Yr.
Mr. Olmsted in charge, Mr. Bennett,
Mr. Chaikoff, Mr. Cook, Mr. Pace
- 203A-203B. Seminar in Physiology. (1-1) Yr. Mr. Olmsted
Designed to give students an acquaintance with recent physiological literature, and practice in making reports.
204. Seminar in the Endocrines. (1-3) I. Mr. Chaikoff
205. Physiological Evolution. (2) II.
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.

POLITICAL SCIENCE

Charles Aikin, LL.B., Ph.D., *Professor of Political Science.*

Eric C. Bellquist, Ph.D., *Professor of Political Science.*

Joseph P. Harris, Ph.D., *Professor of Political Science.*

Hans Kelsen, Ph.D., *Professor of Political Science.*

Leslie Lipson, Ph.D., *Professor of Political Science.*

¹ Austin F. Macdonald, Ph.D., *Professor of Political Science.*

¹ Samuel C. May, M.A., LL.B., *Professor of Political Science and Director of the Bureau of Public Administration.*

^o Peter H. Odegard, Ph.D., *Professor of Political Science (Chairman of the Department).*

Frank M. Russell, Ph.D., *Professor of Political Science.*

* Not to be given, 1951-1952.

¹ In residence fall semester only, 1951-1952.

^o Absent on leave, 1951-1952.

David P. Barrows, Ph.D., LL.D., Litt.D., *Professor of Political Science, Emeritus.*

P. Orman Ray, Ph.D., LL.D., *Professor of Political Science, Emeritus.*

Lloyd H. Fisher, Ph.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.*

Julian Towster, J.D., Ph.D., *Associate Professor of Political Science.*

Dwight Waldo, Ph.D., *Associate Professor of Political Science.*

George A. Lipsky, Ph.D., *Assistant Professor of Political Science.*

² Eugene L. Burdick, Ph.D., *Assistant Professor of Political Science.*

Norman Jacobson, Ph.D., *Instructor in Political Science.*



Thomas A. Bisson, M.A., *Lecturer in Political Science.*

Hugh M. Clokie, Ph.D., *Lecturer in Political Science.*

Richard P. Graves, M.A., *Lecturer in Political Science.*

George C. Guins, LL.M., *Lecturer in Political Science and Slavic Languages.*

Ernst Haas, M.A., *Lecturer in Political Science.*

Boynton Kaiser, A.B., *Lecturer in Political Science.*

Albert Lepawsky, Ph.D., *Visiting Professor of Political Science for the spring semester.*

Leslie Grant McConnell, A.B., *Lecturer in Political Science.*

Frank A. Pinner, A.B., *Lecturer in Political Science.*

Victor Rosenblum, LL.B., *Lecturer in Political Science.*

Joseph W. Rupley, B.S., *Lecturer in Political Science.*

William S. Stokes, Ph.D., *Visiting Professor of Political Science.*

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 69.

Departmental Major Advisers: Mr. Aikin, Mr. Fisher, Mr. Harris, Mr. Lipsky, Mr. Lipson, Mr. Macdonald, Mr. Mah, Mr. May, Mr. Scalapino.

Preparation for the Major.—Students are not accepted in the major in political science unless they have at least a C average in the prerequisite courses. Required: courses 1, 2 (or 1A-1B as formerly given), and one of the following: Anthropology 1, Economics 1A-1B, Geography 1, 2, History 4A-4B, 8A-8B, 17A-17B, Philosophy 6A-6B, Sociology and Social Institutions 1, 2, 10A-10B.

Fields of Study.—Instruction in the department falls into the following main fields: political theory and public law; international relations; government and politics; public administration. Emphasis in one field is required of each major.

The Major.—Candidates' programs must be submitted to a departmental adviser for approval. The department will certify to the completion of a major program for graduation upon fulfillment of the following requirements:

1. Completion of at least 24 units of upper division courses in the major, of which 18 units must be in political science. The 6 upper division units which may be taken in other departments must normally represent courses related to the candidate's field of emphasis and must be approved by his departmental adviser.

2. Inclusion of at least one course in each of the following four groups:

I. 100, 105, 106, 107, 108, 110, 111, 112A, 112B, 113, 115, 116A, 116B, 117, 118A, 118B, 119, 122, 156, 157A, 157B, 158.

² In residence spring semester only, 1951-1952.

- II. 120, 121, 123, 124, 125, 126A, 126B, 127, 128, 129M, 132A, 132B, 133A, 133B, 134, 135, 136, 138, 139, 142, 175, 195A, 195B.
 III. 109, 114, 130, 131, 140, 141A, 141B, 143, 144, 145, 145M, 146, 147A, 147B, 148, 149, 150, 151, 152, 154, 159, 160, 161, 163, 164, 165, 182, 194.
 IV. 155, 162, 172, 174, 176, 177, 180, 181, 183, 184, 185.

3. The candidate must have at graduation at least a C average in all upper division courses included in the major. Students who do not maintain such an average may be required at any time to withdraw from the major in political science.

Special Study Course.—In the senior year students who have shown high attainment may pursue a systematic scheme of reading under the direction of some member of the department. The maximum credit for this course (199) will usually not exceed 4 units in any semester.

LOWEE DIVISION COURSES

1. Introduction to Government. (3) I and II. Mr. Stokes, 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 partial satisfaction of the American History and Institutions Requirement.
2. Introduction to Government (Comparative Government). (3) I and II.
 Two lectures and two section meetings per week. Mr. Lipsky
 A comparative study of constitutional principles, governmental institutions, and political problems of selected governments abroad.

UPPER DIVISION COURSES

Nonmajors who plan to take upper division courses in political science are strongly advised to take courses 1 and 2. Lacking these, or course 1A–1B, students with satisfactory equivalents may be admitted to upper division courses with consent of the instructor.

Unless otherwise stated, the first half of any course (A) is not prerequisite to the second half (B).

Group I—Political Theory and Public Law

100. Origins of Legal Institutions. (2) II. Mr. Kelsen
 The development and agencies of legal growth since primitive times and the interrelations between law and government. The early legal institutions of Europe and their influence on the modern juridical systems.
- *105. Conservatism and Liberalism. (3) I. Mr. Burdick
106. Socialist Theories. (3) II. Mr. Burdick
107. Western Political Thought from the Renaissance to Rousseau. (3) II. Mr. Pinner
108. Soviet Political Theory. (3) I. Mr. Towster
 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. Basic concepts of international relations.
109. Soviet Propaganda. (3) II. Mr. Towster
 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, 1951–1952.

- *110. Recent European Political Thought. (3) I. _____
A study of the political novel.
111. Theory of the State. (3) II. Mr. Jacobson
The nature of the state, its organization and activities, and its relation to individuals and to other states.
- *112A-112B. Principles of Politics. (3-3) Yr. _____
112A. Man and the State. Analysis of the relationship between value systems and political organization and activity.
112B. The State. Its functions and its relation to other states.
113. American Political Theory. (3) I. Mr. Jacobson
Basic problems of political theory as viewed within the context of American history and institutions.
115. Recent American Political Thought. (3) I. Mr. Jacobson
A critical appraisal of recent thinking about American politics. Analysis of economic, religious, literary, and scientific influences in the search for a philosophy for democracy.
- 116A-116B. Soviet Economic Law. (2-2) Yr. Mr. Guins
(Formerly numbered 116.)
116A. A comparative study of the Soviet economic structure and legislation: general principles of private law, including family law; industrial and trade relations; collective farms (kolkhozes); and labor law.
116B. A comparative study of Soviet legal theory, including Soviet theory of international law and of public law, and the judicial system in the Soviet Union and its allied states.
117. Elements of Jurisprudence. (3) I. Mr. Kelsen
Fundamental legal principles, especially from the analytical, historical, philosophical, and sociological points of view. Particular attention will be given to modern theories of the function of law.
- 118A-118B. History of Political Theory. (2-2) Yr. Mr. Jacobson, Mr. Burdick
119. The Development of American Federalism. (3) II. Mr. Rosenblum
The theory and practice of federalism. The Constitutional Convention and the Federalist Papers. The geographic, demographic, economic and constitutional factors affecting the relations between units of government. The future of coöperative federalism.
- *122. The Development of Political Thought in the Far East. (3) II. Mr. Scalapino
Analysis of the political thought of China and Japan, comparison with the heritage of Western political philosophy; examination of modern Oriental political philosophy, the syncretic product of contact with Westernism.
156. Administrative Law. (3) II. Mr. Aikin
A study of the position of the executive branch of government in the American constitutional system, of the foundation of administrative power, of the area of judicial supervision of administration, and of the liability of public officers and of the state based on misuse of administrative power.

* Not to be given, 1951-1952.

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.

Group II—International Relations

*120. Colonies in World Politics. (3) I.

*121. The American Role in the Far East. (3) I. Mr. Scalapino
A survey of the role which the United States has played in the Far East through the examination of such topics as America's role in Asiatic Westernization, United States-Far Eastern foreign policy, Oriental attitudes toward America. Evaluation of present-day problems.

123. International Politics. (3) I. Mr. Russell
Rise and development of the Western State system; problems of nationalism and imperialism, particularly in connection with the peace settlement following the Second World War.

124. International Organizations. (3) II. Mr. Haas
International unions and commissions of the nineteenth century. First World War and establishment of the League of Nations; Second World War and formation of the United Nations and other agencies of international cooperation.

125. Dependent Peoples and Trusteeship. (3) I. Mr. Haas
Historical development of the trusteeship principle; experience under the Mandates System of the League of Nations; the character and implementation of the International Trusteeship System under the Charter of the United Nations.
Normally open only to seniors who have taken course 124.

126A-126B. International Administration. (3-3) Yr. Mr. Haas
126A. Origin, character, and development of international commissions, institutes, unions, and other administrative agencies prior to World War II.
126B. The recent functioning of these and other World War II and post-war agencies associated with the United Nations.

127. Theories of International Relations. (3) II. Mr. Waldo
Historical development and present range of political thought on relations between nations; origins and implications of the idea of sovereignty; the theory of an international community; theories of imperialism; Christian, Communist, and Fascist ideas; geopolitical theories.

*128. Recent American Foreign Policy. (3) I. Mr. Russell
Abandonment of isolation and assumption of leadership during the First World War. Return to isolationist policies in the Twenties. The neutrality acts of the Thirties. The Second World War and reversal of the policy of isolation.

* Not to be given, 1951-1952.

- 129M. Principles of Foreign Policy. (3) I. Mr. Lipsky
The relationship between dominant philosophical trends and theories and national foreign policies.
- 132A-132B. The Revolutionary Process in the Far East. (3-3) Yr. Mr. Scalapino
Definition of revolution; examination of certain classical western revolutions; the nature, technics, and significance of nineteenth- and twentieth-century revolution in the areas of Japan, China, Korea, and Southeast Asia.
- 133A-133B. Principles of International Law. (3-3) Yr. Mr. Kelsen
The nature and sources of international law, its historical development, and its scope and function as a part of the contemporary legal system.
- *134. Problems of Underdeveloped Areas. (3) I. _____
135. Political Development of China. (3) I. Mr. Mah
China as a nation in the Oriental World; impact of the Occident upon China and its repercussions; the internal and external aspects of the struggle for the creation of a modern democratic state; China in international politics.
136. Problems of the Pacific Area. (3) II. Mr. Mah
A discussion of the more important political issues and problems posed by the powers in their relations with each other in the Pacific.
138. International Relations of the Far East. (3) I. Mr. Mah
A general survey.
139. The Problem of Colonialism in the Far East. (3) II. Mr. Mah
A survey of the countries formerly under colonial rule, their postwar domestic political situations and problems of foreign relations in the wake of the demise of Western colonialism.
142. The Foreign Policy of the Soviet Union. (3) II. Mr. Lipsky
The constant factors in Russian foreign policy. Policy of the early years as affected by Marxian ideology, internal conditions, and foreign interference. Period of truce and limited coöperation with the Western Powers. Effect of the breakdown of the League. The Second World War and aftermath.
175. The Conduct of American Foreign Relations. (3) II. Mr. Bellquist
Diplomacy and the conduct and control of foreign relations. The Department of State and the Foreign Service. Case studies in recent diplomacy to illustrate policy formation and execution. Some comparative materials will be introduced but emphasis will be placed upon the United States.
195. Basic Problems of American Far Eastern Policy. (3) I and II. Mr. Bisson
Origins: pre-1840 trade expansion. The opening of China and Japan. Oriental immigration. The Philippines and Hawaii. China and the open-door policy. World War I and Washington Conference. World War II. Postwar developments.

* Not to be given, 1951-1952.

Group III—Government and Politics

114. Public Opinion. (3) I. Mr. Bellquist
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.
- *130. Government and Politics of the Balkan States. (3) II. _____
- *131. The Political Society of Japan. (3) I. Mr. Scalapino
Basic political problems of modern Japan approached through the development of the background of social, economic, and political patterns which have characterized Japanese society. Primary emphasis upon the nature of the evolution through which Japanese society has passed since the middle nineteenth century.
140. Politics of Labor. (3) II. Mr. Jacobson
The trade union as a private government. Major emphasis will be placed upon constitutional structure of trade unions and locus of authority within unions. Regulation of unions through legislative and judicial action, and the international labor movement will be briefly considered.
- 141A-141B. Government of 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 coöperatives. The church; army; courts, prosecutors and organs of police. Statics and dynamics of power in the U.S.S.R.
143. Government of the British Dominions. (3) II. Mr. Lipson
The evolution of the British Commonwealth and changing status of its members; the internal politics of Australia, Canada, South Africa, and New Zealand: their similarities and differences.
144. Government of Great Britain. (3) I. Mr. Lipson
A study of the democratic process in Britain, as it operates through party politics and the machinery of government; the nature of the cabinet system; the functions undertaken by the state; and the gradualist blending of tradition and change.
- *145. Government and Policies of Japan. (3) II. Mr. Mah
- 145M. Government and Politics of Japan. (3) I. Mr. Bisson
How Japan is governed, with consideration of major changes in her basic political structure and policies under Allied military occupation.
- *146. Government and Policies of the Northern Countries. (3) 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. Comparative Government: Government and Politics of France and Italy. (2) I. Mr. Lipson
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.

* Not to be given, 1951-1952.

- 147B. Comparative Government: Government and Politics of Germany and Switzerland. (2) I. Mr. Lipson
A comparative treatment of the political record of two western European communities; the problem of attaining national unity through uniformity or diversity, through a federal or unitary state; the nature of party groupings; the causes of the phenomenon of Nazism.
148. Governments of Latin America. (3) I. Mr. Macdonald
Latin-American parties and politics; governmental activities and problems; the structure of government. Emphasis is placed on political realities rather than formal constitutional provisions.
149. Latin America in World Affairs. (3) II. Mr. Stokes
Relations of Latin America with the United States and other world powers. Pan-Americanism and its relation to world organization. The future of Latin America in the community of nations.
- *150. Survey of American Governments. (3) I and II. Mr. Lipsky
Open to sophomores, juniors, and seniors without prerequisites. Not open to political science majors nor to students who have taken course 1 or 151. Accepted in partial satisfaction of the American History and Institutions Requirement.
151. American National Government. (3) I. Mr. Rosenblum
A survey of the powers, structure, and operation of the Government of the United States and the principles which underlie American democracy. Not open to students who have taken course 1 or 150.
152. Political Parties. (3) I. Mr. Harris
Nature and functions of political parties; their origin, development, structure, economic and social composition, internal management and control; relation of parties and pressure groups to legislation and administration; analysis of pressure politics as distinguished from party politics.
154. American Legislative Bodies. (3) II. Mr. Harris
A study of the organization and operation of Congress and state legislatures; sources of legislation; legislative aid; public policy and pressure groups; legislative leadership; executive-legislative relations; legislative processes; and the reorganization of Congress and state legislatures.
159. Basic Factors in American Politics. (3) I. Mr. Waldo
The constitutional-legal background of American political action; historical, social, and ideological factors affecting American politics; the politics of economic interests and geographical areas; emergent political patterns in the two-party system.
160. Politics of Business. (3) I. Mr. Jacobson
The basic aims and attitudes of the business community; its organization, and its role in the political process.
163. Politics of Agriculture. (3) I. Mr. McConnell
The political expression of agricultural interests in the United States. This course does not duplicate course 163 given 1948-1949.
- *182. Federal, State, and Local Relations. (3) I. Mr. Harris
The legal, financial, and administrative relationships and cooperative arrangements between the several levels of government; centralization, states' rights, uniform state laws, interstate cooperation; home rule and state supervision over cities and other local units of government.

* Not to be given, 1951-1952.

- *190. The Political and Social Structure of Indonesia. (3) II. _____
An analysis of the political, economic, social, and cultural development of Indonesia; the character and growth of its nationalist movement; its present structure and future prospects.
- *191. Western Economy and Politics in Asia. (3) II. _____
The changes in the economic and political structure of selected Asiatic countries as a result of Western trade, Western exploitation of natural resources, and the predominance of Western organization and method, with an emphasis on the resulting trends and reactions in economic policy of Asiatic states.
194. Nationalism and Diplomacy in East Asia. (3) II. Mr. Bisson
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.
- Group IV—Public Administration**
155. National Administration in the United States. (3) II. Mr. Lepawsky
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.
162. Municipal Government and Administration. (3) I. Mr. Macdonald
How cities are organized and what they are doing; municipal politics; relations of city and state; problems and activities of modern cities; traffic regulation, city and regional planning, zoning, police and fire protection, budget making; the war against crime.
172. State Government and Administration. (3) I. Mr. Stokes
Organization of state government; federal-state relations; elections and politics; the courts; county government; current administrative problems such as state finance, the merit system, regulation of business, the state and labor, conservation of natural resources, health, welfare, correction.
- *174. Public Expenditure and Financial Administration. (3) II. _____
176. Recent National Policy. (3) II. Mr. Rosenblum
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.
177. American Judicial Administration. (3) I. Mr. Rosenblum
The organization and operation of American courts. Problems of jurisdiction, staffing, civil and criminal procedure.
- *180. American Administrative Theory. (3) I. Mr. Waldo
A study of the theory of the American public administration movement; leading men, movements, and motifs in the development of administrative doctrine; review and criticism of administrative theory on such subjects as separation of powers and interrelation of functions; relationships of administrative theory and political theory.
181. Principles of Public Administration. (3) I. Mr. May
Development of public administration and its relation to other branches of government; powers and liabilities of administrative officials; organization for different governmental functions, including line, staff, and auxiliary services, with special reference to budget and personnel administration and administrative planning.

183. Public Personnel Administration. (3) I. Mr. Harris
A survey of public personnel administration, including the history of civil service, the personnel agency, classification, recruitment, examination techniques, promotion, service ratings, training, discipline, employee organizations, and retirement.
184. Advanced Principles of Public Administration. (3) II. Mr. Harris
Advanced study of organization, financial administration, planning, overhead management, and the relationships of administration to the legislature, public opinion, and pressure groups.
185. Government Planning. (3) I. Mr. May
An analysis of governmental agencies which conduct research and disseminate information concerning our physical, economic, and human resources, and stimulate, regulate, or control their use through orderly programs of national, regional, and local development directed toward optimum utilization and social stability in peace and mobilization for defense.

GRADUATE COURSES

Admission to all graduate courses is limited to graduate students who have adequate undergraduate course preparation to participate in and benefit from such work. Admission to all graduate courses is at the discretion of the instructor. See also page 139.

Unless otherwise stated, the first half (A) of any seminar is not prerequisite to the second half (B).

200. Bibliography and Research Methods in Political Science. (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.
- 209A-209B. European Political Thought in the Nineteenth Century. (2-2) Yr. Mr. Fisher
An examination of the principal themes of political thought in England and on the Continent from the French Revolution to World War I.
210. Seminar in Modern Political Thought. (2) I. Mr. Clokie
An intensive examination of the basic political attitudes of the modern mind. Research topics center about the impact of technology on politics.
- 212A-212B. Seminar in Contemporary Political Theory. (2-2) Yr. Mr. Fisher, Mr. Burdick
213. Seminar in Political Theory. (2) II. Mr. Russell
A study of theories of imperialism.
214. The Scope and Method of Political Science. (2) I. Mr. Fisher
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. Seminar in Public Opinion. (2) II. Mr. Bellquist
- 228A-228B. Seminar in Russian and Soviet Law. (2-2) Yr. Mr. Guins
Conferences on Russian and Soviet legal theory and public law: self-government and federalism; constitutional problems and individual rights. Study of Soviet legal theory and international private law.

* Not to be given, 1951-1952.

229. Basic Factors in the Foreign Policies of National States. (2) II.
Mr. Russell
- 230A-230B. Seminar in American Foreign Policy. (2-2) Yr. _____
- 231A-231B. Seminar in International Organization. (2-2) Yr. Mr. Haas
- 232A-232B. Seminar in International Relations. (2-2) Yr. Mr. Lipsky
The definition of the field of study. The bases of international relations in conflicting ideologies and philosophies. Special problems: imperialism, population, economic relations, area and regional problems, military factors, geographic factors.
- 233A-233B. Seminar in International Law. (2-2) Yr. Mr. Kelsen
Technique of international law and legal problems of international organization; critical analysis of the Charter of the United Nations; discussion of some actual projects for world organization from a legal point of view.
- *234. Seminar on Selected Problems in Balkan Governments and Politics. (2) II.

235. Problems of Government and Politics in Eastern Europe. (2) II.
Mr. Towster
237. Changing Institutions in Postwar Japan. (2) I. Mr. Bisson
Institutional changes in Japan under the occupation. The new constitution, national and local government, the bureaucracy, political parties, agriculture, industry, labor, foreign trade.
- 238A-238B. Seminar in International Relations: The Far East and the Pacific Area. (2-2) Yr. Mr. Mah
- *239. The Nations of Southeastern Asia. (2) I. _____
The political, economic, strategic and cultural importance of Southeast Asia; the similarities and differences between the main Southeast Asian countries (Ceylon, Burma, Malaya, Thailand, French Indo-China, Indonesia, and the Philippines).
- *240. The Political Structure of the Philippines, Indonesia, and Burma. (2) II. _____
A comparative study of the political history of the three new nations, their relations to their erstwhile mother countries and to the world, and their present political structure.
241. Problems of Government in the U.S.S.R. (2) I. Mr. Towster
242. Seminar on the Constitutional, Political, and Administrative Problems of Dependent Areas. (2) II. Mr. Clokie
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.
- 244A-244B. Seminar in 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. Seminar in Contemporary Political Problems of Japan.
(2-2) Yr. Mr. Scalapino
Restricted to students who have a reading knowledge of Japanese.
246. Seminar in American Far Eastern Policy. (2) II. Mr. Bisson
Nineteenth- and early twentieth-century backgrounds. The two World Wars. United States' role in the postwar Far East.
- 248A-248B. Seminar in Comparative Government. (2-2) Yr. Mr. Bellquist
249. Research in Comparative Government. (2) II. Mr. Lipson
- 250A-250B. Seminar in Governments and International Relations of Latin America. (2-2) Yr. Mr. Macdonald, Mr. Stokes
Problems of government, politics, and administration in Latin America; inter-American relations.
253. Seminar in Comparative National Administration. (2) I. Mr. Waldo
Comparative studies of national administration in relation to constitutional structures, economic systems, historical traditions, and cultural patterns.
- *254. Seminar in Administration and Technology. (2) I. Mr. Waldo
- 255A*-255B. Seminar in Federal Administration. (2-2) Yr. Mr. May, Mr. Lepawsky
Special studies in problems of federal administration.
- 256A-256B. Federal Field Operations. (3-3) Yr. Mr. Rupley
(Formerly numbered 256.)
A work-shop seminar in programs and management of the Federal Government in the field. In addition to the weekly lectures, each student will be assigned to make a reconnaissance survey of a single Federal Agency in some breadth.
- 257A-257B. Seminar in Constitutional and Administrative Law. (2-2) Yr. Mr. Aikin
Fundamental principles of constitutional law; leading cases; judicial decisions affecting the liabilities, rights, duties, and procedure of governmental officers and agencies.
- *258. The Government of Industrial Relations. (2) II. Mr. Fisher
Enrollment limited to ten or twelve students with a background in more than one social science.
An examination of the various interpretations of the trade union and the corporation as characteristic modern institutions.
- 259A-259B. Seminar in American Politics. (2-2) Yr. Mr. Stokes, Mr. Harris
- *260. Governmental Problems of Metropolitan Areas. (2) I. _____
A consideration of the governmental, economic, social, and physical organization of metropolitan areas with special attention to the San Francisco Bay region; and an evaluation of their governmental structure and problems, and techniques used to solve or lessen area-wide difficulties.

* Not to be given, 1951-1952.

- 261A-261B. Municipal Administration. (3-3) Yr. Mr. Graves
Technique 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.
- *262. Problems of Local Government. (2 or 3) II. _____
An evaluation of the structure, organization, functions, and problems of urban and rural local governments.
- *264A-264B. Seminar in Planning. (2-2) Yr. _____
Principles and methods of governmental planning, with particular reference to the work of federal, state, and local planning agencies in California.
- *272. Seminar in State Administration. (2) II. Mr. May
273. Seminar in Public Personnel Administration. (2) II. Mr. Kaiser
(Formerly numbered 273A-273B.)
Techniques and problems in the field of public personnel administration with special reference to federal, state, and local agencies.
- *274A-274B. Public Expenditure and Financial Administration. (2-2) Yr. Mr. Harris
280. Seminar in Administrative Theory. (2) II. Mr. Waldo
- 281A-*281B. Problems in Public Administration. (2-2) Yr. Mr. Harris
An advanced study of the theory and practice of public administration, with especial emphasis upon organization and management, budgeting, and financial control.
- 285A*-285B. Regional Planning and Resources Management. (2-2) Yr. Mr. Lepawsky
A. General principles involved in regional planning as a new and definitive field of public administration. Problems of public policy and its formulation, administrative organization and management, and standards of evaluation. Consideration will be given to the general principles of regional planning and resources management more particularly, and to the constitutional problems involved.
B. Special problems relating to the formulation of policy, administrative areas and organization, and principles of management as they relate to regional problems and the conservation and utilization of natural resources.

COURSES COMMON TO ALL GROUPS

199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Aikin in charge)
298. Individual Study. (1-4) I and II. The Staff (Mr. Waldo in charge)

* Not to be given, 1951-1952.

BUREAU OF PUBLIC ADMINISTRATION

The Bureau of Public Administration maintains an extensive collection of current pamphlets, periodicals, and documents relating to the work of government, in Room 390, Library Annex. Through its director and research staff, it offers to properly qualified graduate students opportunities for study and research in various fields of public administration, and cooperates with governmental agencies in placement.

Further information may be obtained by consulting the Director, Mr. Samuel C. May, Room 345, Library Annex.

BUREAU OF INTERNATIONAL RELATIONS

The Bureau of International Relations, in Room 390, Library Annex, was established by the University in 1921. It provides facilities for upper division and graduate students and interested members of the faculty to enable them to pursue study and research in the field of international law and relations. Among other primary sources, it contains a complete set of official documents of the League of Nations, including its Treaty Series, the Publications of the Permanent Court of International Justice, and the documentation of the United Nations. In addition to the documentary collection, the Bureau has many important secondary works dealing with current international problems, a number of outstanding American and foreign periodicals, and certain American and English newspapers regarded as most useful in the field.

PSYCHOLOGY

Olga L. Bridgman, M.D., Ph.D., Sc.D., *Professor of Psychology and Pediatrics.*

Clarence W. Brown, Ph.D., *Professor of Psychology (Chairman of the Department).*

Warner Brown, Ph.D., *Professor of Psychology.*

Egon Brunswik, Ph.D., *Professor of Psychology.*

Edwin E. Ghiselli, Ph.D., *Professor of Psychology.*

Harold E. Jones, Ph.D., *Professor of Psychology.*

David Krech, Ph.D., *Professor of Psychology.*

² Jean Walker Macfarlane, Ph.D., *Professor of Psychology.*

Donald W. MacKinnon, Ph.D., *Professor of Psychology.*

Robert Choate Tryon, Ph.D., *Professor of Psychology.*

George M. Stratton, Ph.D., *Professor of Psychology, Emeritus.*

* Egerton L. Ballachey, Ph.D., *Associate Professor of Psychology.*

Mason Haire, Ph.D., *Associate Professor of Psychology.*

Theodore R. Sarbin, Ph.D., *Associate Professor of Psychology.*

Read D. Tuddenham, Ph.D., *Associate Professor of Psychology.*

Audrey Schumacher, Ph.D., *Associate Clinical Professor of Psychology.*

* Ralph R. Canter, Ph.D., *Assistant Professor of Psychology.*

Harrison G. Gough, Ph.D., *Assistant Professor of Psychology.*

Rheem F. Jarrett, Ph.D., *Assistant Professor of Psychology.*

Barbara Kirk, M.A., *Assistant Professor of Psychology.*

John P. McKee, Ph.D., *Assistant Professor of Psychology.*

Leo J. Postman, Ph.D., *Assistant Professor of Psychology.*

Benbow F. Ritchie, Ph.D., *Assistant Professor of Psychology.*

² In residence spring semester only, 1951-1952.

* Absent on leave, 1951-1952.

Mark R. Rosenzweig, Ph.D., *Assistant Professor of Psychology.*

Alex C. Sherriffs, Ph.D., *Assistant Professor of Psychology and Lecturer in Child Psychology, School of Nursing.*

Shirley L. Hecht, Ph.D., *Instructor in Psychology.*

Donald A. Riley, Ph.D., *Instructor in Psychology.*



Edward N. Barnhart, Ph.D., *Lecturer in Psychology and Assistant Professor of Speech.*

Nancy Bayley (Nancy Bayley Reid), Ph.D., *Lecturer in Psychology.*

Else Frenkel-Brunswik, Ph.D., *Lecturer in Psychology.*

Robert E. Harris, Ph.D., *Lecturer in Psychology and Associate Professor of of Psychiatry.*

Mary C. Jones, Ph.D., *Lecturer in Psychology.*

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 69.

Departmental Major Advisers: Mr. Gough, Mr. Ritchie, Mrs. Schumacher, 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.

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

Abnormal Psychology: courses 160, 168

Clinical Psychology: courses 162, 165

Developmental Psychology: courses 112 and 113 or 114

Differential Psychology: course 146A–146B

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

Physiological Psychology: course 108A–108B

Social Psychology: courses 145 and 142A or 142B

Tests and Measurements: courses 104, 186

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, 113, 116, 153, 154, 161, 164
 Genetics 100, 102
 Home Economics 132, 133, 142
 Optometry (Physiological Optics) 105B, 106B
 Political Science 181, 183
 Social Welfare 104, 105, 106, 108
 Speech 117A-117B, 118, 119
 Zoölogy 114, 115

Any upper division course in:

Anthropology
 Mathematics
 Philosophy
 Physiology
 Sociology and Social Institutions.

The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses included in the major. Students who do not maintain such an average may be required at any time to withdraw from the major in psychology.

Honor Students.—Honors are granted on the basis of the whole record of the student.

LOWER DIVISION COURSES

- 1A. General Psychology. (3) I and II. Mr. W. Brown
 Three lectures and one section meeting 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
 Prerequisite: course 1A.
 A continuation of course 1A with a detailed treatment of the application of the scientific method in the study of behavior. Basic assumptions, limitations, and advantages of the method of experiment. Intended primarily for prospective major students.
3. Introduction to Applied Psychology. (3) II. Mr. Ghiselli
 Prerequisite: sophomore standing.
 A survey of psychological problems involved in the selection of employees, industrial production, conditions of work, motivation of employees, advertising, selling, market research, measurement of public opinion, law, and highway safety.
5. Introduction to Psychological Measurements. (3) I and II. Mr. Jarrett, Mr. Rosenzweig
 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. Haire, Mr. Ritchie
 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 the 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.
- 102A-102B. Advanced General Psychology. (3-3) Yr. ———
 Lectures and laboratory.
 Prerequisite: course 101A-101B and consent of the instructor. Restricted to major students.
 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) II. 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. Enrollment limited to twenty students.
Prerequisite: courses 1A, 1B, 5, and Physiology 1 or consent of the instructor.
111. Child Psychology. (2) I. Mr. Jones
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) I. Mr. McKee
Weekly section meetings to be arranged.
Prerequisite: courses 1A, 1B, and 5.
This course is for majors in psychology; majors in closely related departments or fields will be admitted by consent of the instructor. Credit cannot be taken for both 111 and 112.
The development of motor functions, social and emotional traits, language, and mental abilities. Individual differences in development and performance, as related to physical, social, and psychological factors.
113. Adolescence. (2) II. Mr. Jones, Mr. McKee
Prerequisite: Section 1: courses 1A, 1B, and 5 (this section for psychology majors). Section 2: course 1A and either 1B, 5 or 33 (this section for nonpsychology majors).
A survey of current research, with particular reference to the analysis and interpretation of data from growth studies.
114. Laboratory in Child Study. (2) I. 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 the instructor.
Offered to a limited number of students also enrolled in course 113.
Individual projects and reports.
116. Tests and Measurements of Infants and Preschool Children. (1) II.
Prerequisite: courses 5 and 112 or Home Economics 132. Miss Bayley
Instruction in the most commonly used techniques of measurement of physical, motor, and mental development, with evaluation and interpretation of test scores and measures of infants and young children.

* Not to be given, 1951-1952.

117. Laboratory Tests and Measurements of Infants and Preschool Children. (2) II. Miss Bayley

Prerequisite: consent of the instructor.

Laboratory work at the Institute of Child Welfare, accompanying course 116.

120. Introduction to History and Systems of Psychology. (3) II.

Mr. Brunswick

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 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.

Mr. W. Brown

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. Brunswick

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) II.

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) I.

Mr. Riley

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. MacKinnon

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) I.

Mr. Gough

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 equivalents, and consent of the instructor.

142A. The design of experiments in social psychology utilizing the social survey methodology.

* Not to be given, 1951-1952.

142B. The design of experiments in social psychology utilizing laboratory and field methods other than the social survey.

Either half of the course may be taken independently.

143. Propaganda. (3) II.

Mr. Krech

Prerequisite: courses 1A, and 1B or 33.

Theory of suggestions, imitation, and propaganda; the function of speech in propaganda and communication; analysis of current propaganda techniques and objectives.

144. Social Psychology of the Interview. (3) II.

Mr. Ballachey

Lectures and laboratory.

Prerequisite: courses 1A and 145 or consent of the instructor.

Processes of communication in interview techniques used in the social sciences, with special reference to distortions arising from differences in psychosociological frames of reference of the participants.

145. Social Psychology. (3) I and II.

Mr. Tryon, Mr. Ballachey

(Formerly numbered 145A.)

Prerequisite: course 1A.

Sections to be arranged.

Psychological nature of: society, its functions and instruments; social groups, their ways, sanctions, symbols, social controls; social status, prestige and mobility; social interaction, including conflict; social change. The person's adjustment to these phenomena.

146A-146B. Differential Psychology. (3-3) Yr.

Mr. Tryon

Prerequisite: courses 1A, 5, and 1B or 33.

Lectures and laboratory.

146A. The origin and nature of psychological differences between individuals.

146B. Continuation of 146A, an introduction to factor and cluster analysis of individual and group differences.

Course 146A may be omitted as prerequisite to 146B with consent of the instructor.

*148A-148B. Personality. (3-3) Yr.

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. Ritchie

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) I.

Mr. Ritchie

Lecture and laboratory.

Prerequisite: course 150A and consent of the 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.

* Not to be given, 1951-1952.

161. Personality Development. (3) I. 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) II. Mrs. Macfarlane
Prerequisite: courses 1A, 1B, 5 or equivalent, and either course 112, 113, 160, 168 or Home Economics 132.
Behavior of normal children. 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 the instructor, premedical status.
The relations of psychology to the psychoneuroses and psychoses; the appearance of abnormal traits in incipient stages of mental disturbance.
- *180. Psychological Aspects of Advertising 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 and II. ———
Prerequisite: courses 1A, 1B, and 5.
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, and 183.
Theories and principles of differences among individuals relevant to industrial problems; concepts and methods in occupational analysis classification; tests, interviews, and allied methods for appraising occupational fitness.
187. Human Relations in Industry. (3) II. Mr. Haire
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) I. Mr. Haire
(Formerly numbered 139.)
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.

* Not to be given, 1951-1952.

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. Mr. C. W. Brown
206. Advanced Experimental Psychology. (3) II. Mr. Brunswick
Prerequisite: course 101A-101B, or equivalent upper division laboratory course in experimental psychology and some background in statistics.
Selected major problems from the literature and attempts at their solution will be presented, discussed, and analyzed from the point of view of experimental design.
- 206E. Seminar in Experimental Psychology. (2) I and II.
Mr. W. Brown, 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 equations 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) II. Mr. Rosenzweig
- 209E. Seminar in Individual Differences. (2) II. Mr. Tryon
- †210E. Seminar in Constitutional Psychology. (2) I and II.
Mr. Tuddenham
- †211E. Development of Complex Behavior in Children. (2) II. Mr. McKee
Prerequisite: courses in child psychology, learning, and motivation.
The development of complex response patterns; including cooperation, competition, aggression, dependence and status-striving. Topics will vary from year to year. Evidence from objective studies with animals and children will be considered.
- 212E. Seminar in Developmental Psychology. (2) I. Mr. Jones, Mrs. Jones
228. The Conceptual Framework of Psychology. (3) I. Mr. Brunswick
Prerequisite: course 120 or any acceptable course in history or systems of psychology. Graduate students in philosophy, sociology, biology, or physics may be admitted by consent of the instructor.
Further discussion of history and systems of psychology, with special emphasis on the philosophy of science as applied to psychology. Introspective and objective, molecular and molar, peripheral and central-distal point of view. The status of theory in modern psychology; description versus explanation, idiographic versus statistical versus nomothetic approach.

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

- 231E. Seminar in Perception. (2) II. Mr. Brunswik
Prerequisite: consent of the instructor.
Discussion of published or current work on the cognitive aspects of perception.
- †235E. The Nature of Psychological Change. (2) II. Mr. Sherriffs
Examination of the basic principles applicable to the major categories of psychological change such as learning and problem solving, personality restructuring, and modification of social patterns. Critical evaluation of the constructs available for the study of such change will be undertaken.
- †239E. Social Perception. (2) I and II. Mr. Haire
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.
242. Opinions, Beliefs, and Attitudes. (3) I. Mr. Krech
Enrollment limited to twenty-five students.
The theory of enduring cognitive organizations, their role in social behavior, their control and change; a critical review of current measurement techniques as used in laboratory and field studies of opinions, beliefs, and attitudes.
- 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. Mr. Krech, Mrs. Frenkel-Brunswik
An examination of current theory of perceptual and cognitive processes with special attention to these processes as aspects of the personality structure of the individual. Emphasis will be on the experimental approach.
247. Advanced Group Dynamics and Group Therapy. (3) I. _____
Two two-hour sessions per week.
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. _____

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

- *248E. Seminar in Personality. (2) I. _____
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) II. Mr. Ritchie
- 261A-261B. Clinical Methods. (3-3) Yr. Mr. Tuddenham, Mrs. Hecht
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. _____ (in charge), Mr. Gough
Prerequisite: course 261B or consent of the 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.
Prerequisite: course 261B. Mrs. Hecht, Mr. Sarbin, _____
The case history method in psychology with emphasis on diagnostic aspects.
- 265E-265F. Advanced Seminar in Case History. (2-2) Yr.
Prerequisite: course 264F. Mrs. Schumacher, Mr. Sherriffs
The case history method in psychology with emphasis on therapeutic aspects.
- 266E. Seminar in Theories of Therapy. (2) I. Mrs. Schumacher
Prerequisite: course 264F.
A critical survey of the major theories upon which psychotherapy is based.
- *267E. Seminar in Medical Psychology. (2) II. _____
- †268E. Seminar in Abnormal Psychology. (2) I and II. Miss Bridgman
- 269E. Seminar in Clinical Research Methods. (2) I and II.
Mr. Sarbin, 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.

* Not to be given, 1951-1952.

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

298. Proseminar in Research Methods. (2) I.

Mr. Ghiselli, Mr. Krech, Mr. Sarbin

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.

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

Jessie M. Bierman, M.D., M.S.P.H., *Professor of Maternal and Child Health.*Harold B. Gotaas, Sc.D., *Professor of Sanitary Engineering.*Dorothy Bird Nyswander (Dorothy Nyswander Palmer), Ph.D., *Professor of Public Health.*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 Practice (Chairman of the Department).*Jacob Yerushalmy, Ph.D., *Professor of Biostatistics.*Robert T. Legge, Ph.G., M.D., F.A.C.S., *Professor of Hygiene, Emeritus, and Lecturer in Industrial Medicine, Emeritus.*Margaret Beattie, M.A., Gr.P.H., *Associate Professor of Public Health.*William Griffiths, Ph.D., *Associate Professor of Public Health.*Walter S. Mangold, B.S., *Associate Professor of Public Health.*William C. Reeves, Ph.D., M.P.H., *Associate Professor of Epidemiology.*William W. Stiles, M.D., M.P.H., *Associate Professor of Public Health.*Bernard D. Tebbens, Sc.D., *Associate Professor of Industrial Hygiene Engineering.*Charles H. Hine, Ph.D., M.D., *Assistant Professor of Public Health.*Nell F. Hollinger, Ph.D., *Assistant Professor of Public Health.*Edith M. Lindsay, Ed.D., *Assistant Professor of Public Health.*Eugene K. Harris, Ph.D., *Instructor in Biostatistics.** William F. Taylor, Ph.D., *Instructor in Public Health.*Susan J. Anderson, B.S., *Associate in Public Health.*Elizabeth B. Austin, A.B., *Associate in Public Health.*Dorothy L. Chandler, A.B., *Associate in Public Health.*Chin Long Chiang, M.A., *Associate in Public Health.*Helen Formos, M.A., *Associate in Public Health.*Jerome Grossman, M.P.H., *Associate in Public Health.*Fora J. Hanks, R.N., A.B., *Associate in Public Health.*William J. Hayes, M.P.H., *Associate in Public Health.*Richard K. Lansing, M.P.H., *Associate in Public Health.*Charles R. Nicewonger, M.A., *Associate in Public Health.*Fern Sceder, M.A., M.P.H., *Associate in Public Health.*William D. Simmons, M.P.H., *Associate in Public Health.*

* Absent on leave, 1951-1952.

Richard V. Walker, B.S., *Associate in Public Health.*



- Genevieve I. Anderson, M.P.H., *Lecturer in Public Health.*
 Mortimer A. Benioff, M.D., *Lecturer in Public Health.*
 Dwight M. Bissell, M.D., M.S.P.H., *Lecturer in Public Health.*
 Harold D. Chope, M.D., Dr.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.*
 Fern E. French, M.A., *Lecturer in Public Health.*
 David Frost, M.D., M.P.H., *Lecturer in Public Health.*
 Carl Goetsch, M.D., *Lecturer in Public Health.*
 Harold F. Gray, M.S., Gr.P.H., *Lecturer in Public Health.*
 Lewis W. Hackett, M.D., Dr.P.H., *Lecturer in Public Health.*
 Floyd W. Hartmann, Sc.D., *Lecturer in Public Health.*
 Arthur C. Hollister, Jr., M.D., M.P.H., *Lecturer in Public Health.*
 Frank L. Kelly, M.S., M.D., Dr.P.H., *Lecturer in Public Health.*
 Richard A. Koch, M.D., M.P.H., *Lecturer in Public Health.*
 Hugo M. Kulstad, D.D.S., *Lecturer in Public Health.*
 Edwin H. Lennette, M.D., Ph.D., *Lecturer in Virology and Lecturer in Bacteriology for the spring semester.*
 Wilma Lloyd, M.A., *Lecturer in Public Health.*
 John R. McKinley, M.A., *Lecturer in Public Health.*
 Alfred E. Maffly, B.S., *Lecturer in Public Health.*
 Malcolm H. Merrill, M.S., M.D., M.P.H., *Lecturer in Public Health.*
 Karl F. Meyer, A.B., Dr.Phil. (Zurich), Dr.Med. h.c. (Zurich), *Lecturer in Public Health.*
 William W. Sampson, Ph.D., *Lecturer in Public Health.*
 Marion W. Sheahan, B.S., *Lecturer in Public Health.*
 James H. Skillin, M.S., M.P.H., *Lecturer in Public Health.*
 Tracy I. Storer, Ph.D., *Lecturer in Public Health.*
 Richard J. Stull, A.B., *Lecturer in Public Health.*
 Keith O. Taylor, Ph.B., M.B.A., *Lecturer in Hospital Administration.*
 Helen E. Walsh, M.A., *Lecturer in Public Health.*
 Kent Zimmerman, M.D., *Lecturer in Public Health.*

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 69.

LOWER DIVISION COURSES

- 5A. Elementary Public 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. Elementary Public Health. (3) I and II. Mr. Stiles
 Prerequisite: course 5A.
 Continuation of 5A.

35. Personal Health Problems. (3) I and II. Miss Lindsay
 Enrollment limited to students in the lower division. Sections limited to fifty students.
 A consideration of the factors which determine physical, mental, and emotional health and influence the prevention of disease. Application of these factors to the solution of individual health problems.
49. Field Training Course. (No credit) Given during the four weeks following the close of each semester. Mr. Mangold, Mr. Sampson, Mr. Skillin
 Prerequisite: consent of the instructor.
 Field training in health departments and/or military establishments for learning administrative methods and practical procedures in environmental sanitation.

UPPER DIVISION COURSES

- 100A. Introduction to Health Administration. (3) I and II.
 (Formerly numbered 105.) Mr. Kelly, Mr. McKinley
 Prerequisite: course 5A-5B or consent of the instructor.
 Principles of public administration and fundamentals of organization and administration in public health.
- 100B. Introduction to Health Administration. (3) II. Mr. K. O. Taylor
 Prerequisite: consent of the instructor.
 Principles of hospital and medical care organization and administration.
- *101A-101B. Laboratory in Administration. (1-1) Yr. Mr. Rogers
 Laboratory, three hours per week.
 Discussion and exercises in the fundamental skills of administration as applied to public health practice.
- 103A-103B. Hospital Organization and Management. (3-3) Yr.
 Mr. Maffly, Mr. Stull, Mr. K. O. Taylor
 Prerequisite: Business Administration 1A-1B. Restricted to students enrolled in the Hospital Administration curriculum or consent of the instructor.
 Consideration of the fundamentals of organization, business and financial management, personnel management, plant operation, staff organization, and community relationships as applied to hospital administration.
106. Medical Sociology. (3) I. Mr. Rogers
 A consideration of the social and economic factors relating to health, disease, and the receipt of medical care.
- †108. Advanced Problems in Public Health Administration. (1-5) I and II.
 Mr. Rogers
109. Advanced Problems in Medical Administration. (1-5) I and II.
 Prerequisite: consent of the instructor. Mr. K. O. Taylor
110. Sanitation. (3) I and II. Mr. Gray
 Fundamentals of housing, heating, ventilation, lighting, water supply, waste disposal, insect and rodent control, and control of milk and other food supplies.
111. Environmental Sanitation. (1) II. Mr. Gotaas, Mr. Mangold
 A condensed presentation of the principles and practices of environmental sanitation for advanced public health students.

* Not to be given, 1951-1952.

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

112. Control of Rodents Affecting the Public Health. (2) I and II.
Prerequisite: consent of the instructor. Mr. Sampson
The role of the common rodents in the transmission and causation of diseases of human beings and domesticated animals; other relations to human affairs, identification of species; principles governing control.
- 113A. Principles and Practices in Sanitary Inspection. (3) I and II.
Mr. Sampson, Mr. Skillin
Lectures, two hours per week; laboratory or field trips, three hours per week.
Prerequisite: course 110 and consent of the instructor.
Objectives and special techniques in general sanitation covering communicable disease control, water and sewage, housing, ventilation, lighting, and vector control.
- 113B. Principles and Practices in Sanitary Inspection. (3) II.
Mr. Sampson, Mr. Skillin
Lectures, two hours per week; laboratory or field trips, three hours per week.
Prerequisite: course 110 and consent of the instructor.
Objectives and special techniques in food sanitation covering milk, meat, markets, restaurants, and processing plants.
114. Advanced Problems in Sanitation. (1-5) I and II. Mr. Mangold
125. Child Health. (3) I. Miss Bierman
Lectures, three hours per week; 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. Mr. Griffiths
Prerequisite: Primarily for students majoring in some area of health work who have consent of the instructor.
Emphasis will be placed on techniques of teaching health to adults through the media of radio, films, slides, posters, press, printed materials, and lectures. Research in these fields will be evaluated and exercises in preparing and using materials will be included.
132. Group Study in Health Instruction. (2) II. Miss Lindsay
Prerequisite: open to seniors majoring in health education and graduate students in public health.
Considerations basic to health instruction with community groups. Evaluation of objectives, methods, and resource materials.
133. Introduction to Group Process. (2) I. Miss Nyswander, Mr. Griffiths
Prerequisite: open only to undergraduate students in public health with consent of the 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) II. Mr. Griffiths
Primarily for students majoring in health education who have taken basic courses in biological sciences, education, and psychology. Theory and field problems in community health education. Review of studies relating to factors affecting group learning.

135. Individual Health. (3) I. Miss Lindsay
A consideration of fundamental physiological mechanisms and application to promotion and protection of health.
136. Health Programs for the School-Aged Child. (2) II. Miss Lindsay
Consideration of the community resources contributing to a health program for the school-aged child; administrative and organizational principles involved.
145. Community Control of the Communicable Diseases. (3) I and II. Mr. Bissell
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 at least equivalent to that presented in Bacteriology 7.
Principles of epidemiology and a study of the infection chains of certain type diseases.
- 147B. Applied Epidemiology. (2) II. Mr. Reeves, Mr. Smith
Discussion and lectures, two hours per week; laboratory, three hours per week. Separate discussion hours for those with an M.D. degree and other graduate students with suitable background in communicable disease studies.
Prerequisite: course 147A or 245 (145 may be substituted for 245 by special permission) and 162 or 261, or consent of the instructor.
Methods of investigating epidemics: collection, analysis, and report on data.
- †149. Advanced Problems in Epidemiology. (1-5) I and II. Mr. Reeves, Mr. Smith
Prerequisite: course 147B or consent of the instructor.
- 150A. Clinical and Public Health Laboratory Procedures. (8) I. Miss Hollinger and the Staff
Prerequisite: Biochemistry 103 and Bacteriology 101 (may be taken concurrently), and consent of the instructor. Enrollment limited to forty students.
Basic principles and laboratory methods in clinical chemistry, hematology, and mycology, as required in clinical and public health practices.
- 150B. Clinical and Public Health Laboratory Procedures. (8) II. Miss Beattie and the Staff
Prerequisite: Bacteriology 101, and consent of the instructor.
Enrollment limited to forty students.
Laboratory identification of the etiological agents of communicable diseases and bacteriological and chemical examination of water, milk, and utensils.
153. Applied Biology of Sanitation. (4) I. Mr. Skillin
Lectures, two hours per week; laboratory and field studies, six hours per week.
Prerequisite: Bacteriology 2. Primarily for students in the public health sanitation curriculum, but open to others with consent of the instructor.
Principles of the life sciences relevant to control of environmental sanitation, and techniques of their application.

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

- †154. Advanced Problems in Public Health Laboratory. (1-5) I and II. Miss Beattie, Miss Hollinger
Prerequisite: consent of the instructor.
Special investigations of public health and clinical laboratory problems.
- †155. Optical and Electrical Techniques. (2) II. Miss Hollinger
Lecture, one hour per week; laboratory, to be arranged.
Prerequisite: consent of the instructor. Enrollment limited.
The applications of optical and electrical methods to analysis in biological laboratories.
- 160A. Biometry. (3) I and II. Mr. Harris
Lectures, two hours per week; laboratory, three hours per week.
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. Harris
Lectures, two hours per week; laboratory, three hours per week.
Prerequisite: course 160A, or consent of the instructor.
Bivariate distributions, elementary methods of sampling, introduction to analysis of variance, special methods applicable to biological data.
- 161A. Applied Biostatistics. (3) I. Mrs. French
Lectures, two hours per week; laboratory, four hours per week.
Prerequisite: course 5A-5B or consent of the instructor.
Elements of vital statistics and demography. Includes consideration of problems of registration, enumeration, morbidity and mortality statistics.
- 161B. Applied Biostatistics. (4) II. Mrs. French, Mr. Yerushalmy
Lectures, two hours per week; laboratory, six hours per week.
Prerequisite: course 161A.
Extension of methods introduced in 161A to more advanced problems. Methods of establishing record systems for health activities including case registers for chronic diseases; evaluation and analysis.
162. Public Health Statistics. (3) I and II. Mrs. French, Mr. Yerushalmy
Lectures, two hours per week; laboratory, three hours per week.
An applied course in public health statistics designed primarily for students in the School of Public Health not majoring in biostatistics. Fall semester enrollment limited to graduate students; spring semester to undergraduate students.
- †163. Demography. (2) II. Mr. Yerushalmy in charge
Lecture, one hour per week; laboratory, three hours per week.
Prerequisite: course 160A or 161A or consent of the instructor.
Introduction to demography and population problems.
- †164. Advanced Biometry. (2) I. Mr. Yerushalmy in charge
Lecture, one hour per week; laboratory, three hours per week.
Prerequisite: course 160B.
Extension of methods introduced in 160B including methods of small samples, analysis of variance.

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

- †169. *Advanced Biostatistics*. (1-5) II. The Staff (Mr. Yerushalmy in charge)
 Prerequisite: courses 160B and 161B.
 Advanced course for students majoring in biostatistics.
170. *Introduction to Occupational Health and Industrial Hygiene*.
 (3) I and II. Mr. Tebbens
 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 the equivalent; Mechanical Engineering 103.
 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 per week.
 Prerequisite: consent of the 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.
187. *Medical Background for Public Health*. (2) I. Mr. Frost, Miss Lindsay
 Observation, six hours per week.
 Prerequisite: consent of the instructor.
 Preventive and remedial medical practice illustrated by ward and clinic visits, conferences, and demonstrations. The nature of disease and the basis of therapy are presented to acquaint the nonmedical health worker with the major causes of morbidity.
189. *Nutrition Problems in Public Health*. (1) II. Miss Walsh
 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 139)

- 200A-200B. *Principles of Public Health Organization and Administration*.
 (3-3) Yr. Mr. Rogers
 A systematic study of the principles of organization and administration and of their application to public health practice.

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

- 203A-203B. Seminar in Hospital Administration. (2-2) Yr.
Mr. K. O. Taylor, Mr. Maffly, Mr. Stull
- *206A-206B. Seminar in Medical Care Administration. (2-2) Yr. ———
Limited to graduate students specializing in hospital or medical care administration, or by consent of the 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. Gray, Mr. Mangold
- 214A-214B. Seminar in Sanitation. (2-2) Yr. Mr. Mangold
- *224. Seminar in Public Health Nursing Administration. (1) I and II. ———
227. Seminar in School Health Administration. (2) II.
Miss Bierman, Miss Nyswander, Mr. Griffiths
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.
228. Group Study in Maternal and Child Health. (4) II.
Miss Bierman, Mr. Goetsch
Prerequisite: open to physicians with consent of the instructor.
Study of obstetric problems and practice having public health significance and the health and developmental problems of infants and young children. Offers opportunity for intensive work with young children and their parents.
- 229A-229B. Seminar in Maternal and Child Health Administration. (1-1) Yr.
Miss Bierman
Prerequisite: open to physicians and others with the consent of the instructor.
Deals with problems of maternity and infancy, preschool years, later childhood, adolescence, handicapped children, and the public health programs designed to deal with them. Students will undertake field studies.
231. Seminar in Mass Media Techniques of Health Education. (1) II.
Miss Nyswander
Prerequisite: open only to graduate students in public health who have been enrolled in the School of Public Health for one semester or who have the consent of the instructor.
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, Mr. Griffiths
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.

* Not to be given, 1951-1952.

234A-234B. Seminar in Community Health Education. (1-2) Yr.

Miss Nyswander, Mr. Griffiths

Prerequisite: open to graduate students who are taking or have taken course 200A-200B.

Problems in relating the philosophy of health education to public health administration. Field observations during second semester.

238. Seminar in Mental Health. (1) II.

Mr. Zimmerman

245. Biology of Infectious Diseases (Epidemiology). (4) I.

Mr. Reeves, Mr. Smith

Lectures and demonstrations, six hours per week.

Prerequisite: an M.D. degree or consent of the instructor for those with adequate background in medical bacteriology, immunology, and medical entomology. To be taken concurrently with course 162.

Discussion of parasite, vector, reservoir host, and the infection chain. Consideration of most recent advances in microbiological laboratory methods and interpretation of results, particularly as applied to epidemiological investigations.

†248. Advanced Problems in Epidemiology. (1-5) I and II.

Mr. Reeves, Mr. Smith

Prerequisite: courses 245 and 147B; and 162 or 160A and 161A.

†249A-249B. Seminar in Epidemiology. (1-1) Yr. 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: primarily for candidates for the degree of Master of Public Health in biostatistics.

Quantitative methods in medicine and public health. Includes study of discrete and continuous distributions of a single variable, bivariate distributions, sampling.

262. Advanced Biostatistics. (3) II.

Mr. Yerushalmy

Lectures, two hours per week; laboratory, three hours per week.

Prerequisite: course 260.

Extension of methods introduced in course 260 to more advanced problems.

†263. Administrative Statistics. (3) I and II.

Mr. Yerushalmy

Lectures, two hours per week; laboratory, three hours per week.

Prerequisite: course 161B or consent of the instructor.

Problems associated with the establishment and maintenance of record systems in medical institutions and public health agencies. Of use primarily in program administration.

†264. Biostatistical Methods in Medical and Public Health Research. (2) II.

Mr. Yerushalmy

Lecture, one hour per week; laboratory, three hours per week.

Prerequisite: course 260 or 261.

Biostatistical methods useful in field studies in medicine and public health. Planning of field studies and scientific evaluation.

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

- †265. Special Biostatistics Methods. (2) II. Mr. Yerushalmy
Lecture, one hour per week; laboratory, three hours per week.
Rates and ratios, life tables, and other methods applicable to the study
of chronic diseases.
- †268. Special Studies in Biostatistics. (1-5) I and II. Mr. Yerushalmy in charge
Research projects undertaken by students under the direction of the
staff.
- †269A-269B. Seminar in Biostatistics. (1-1) Yr. Mr. Yerushalmy in charge
- †274A-274B. Seminar in Industrial Health. (1-2) Yr. Mr. Tebbens
- 284A-284B. Seminar in Public Health Dentistry. (1-1) Yr. Mr. Kulstad
287. Clinical Problems in Public Health. (1-4) I and II. Mr. Smith
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.
288. Fundamentals of Public Health for Disaster Control. (3) I. Mr. Smith
Prerequisite: consent of the instructor.
Fundamentals of public health, including administration, epidemiology
and vital statistics, sanitation and industrial hygiene, for orientation in
relation to disaster control.
- †289A-289B. Seminar in Public Health Nutrition. (2-2) Yr. Miss Walsh
297. Directed Field Study. (No credit) Given immediately following the close
of each semester. The Staff (Mr. Smith in charge)
298. Directed Group Study of Graduate Students. (1-5) I and II.
The Staff (Mr. Smith in charge)
299. Special Study for Graduate Students. (1-5) I and II.
The Staff (Mr. Smith in charge)

ROMANCE PHILOLOGY

Francis J. Carmody, Ph.D., *Professor of French.*

Ronald N. Walpole, Ph.D., *Professor of French.*

Yakov Malkiel, Ph.D., *Associate Professor of Romance Philology.*

Departmental Major Adviser: Mr. Malkiel.

Courses 201, 203A-203B, and 205 are open only to students who have had at least one year of graduate study, including Old French and either Italian Dialects or Old Spanish.

- *200. Linguistic History of the Roman Empire. (2) I. Mr. Malkiel
The external history of the spread of Latin over the Western Mediter-
ranean area, its gradual diversification, and change into the Romance dia-
lects, 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.

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

* Not to be given, 1951-1952.

464 *Romance Philology; Scandinavian Languages and Literature*

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.
- *204. Comparative Romance Phonetics. (2) I. Mr. Carmody
Prerequisite: course 202.
Problems in phonetic analysis, involving the use of field methods. Special attention will be paid to comparison of phonetic developments within the Western Romance Group.
- *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.
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).
Italian Philology and Dialects (Italian 201A-201B).
Old Spanish (Spanish 212A-212B).

SCANDINAVIAN LANGUAGES AND LITERATURE

Assar Götrik Janzén, Ph.D., *Professor of Scandinavian Languages and Literature (Chairman of the Department)*.

- *Harald Noreng, Ph.D., *Assistant Professor of Scandinavian Languages and Literature*.



Margrethe Schioler, M.A., *Lecturer in Scandinavian*.

Letters and Science List.—All undergraduate courses in Scandinavian Languages and Literature are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: Mr. Janzén.

Preparation for the Major.—At least twelve units from the lower division course sequences 1A-1B, 3A-3B, 4-14; or the equivalent.

The Major.—Twenty-four units in upper division courses, including at least nine units made up from courses 101A-101B, 103A-103B, 111, 113, 114. Six of the 24 units may be in related work in other departments.

* Not to be given, 1951-1952.

° Absent on leave, 1951-1952.

Honor Students in the Upper Division.—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. (3-3) Yr. Mr. Janzén
 1A. Swedish grammar, composition, reading.
 1B. Advanced composition, conversation, reading.
- 3A-3B. Elementary Norwegian. (3-3) Yr. Miss Schioler
 3A. Norwegian grammar, composition, reading.
 3B. Advanced composition, conversation, reading.
- *4. Elementary Danish. (3) I. _____
 Composition, conversation, reading of selected texts.
- *14. Intermediate Danish. (3) II. _____
 Composition, conversation, reading of selected texts.

UPPER DIVISION COURSES

I

- *101A-101B. Advanced Swedish. (3-3) Yr. Mr. Janzén
 Intensive reading of masterpieces; composition and conversation.
- *103A-103B. Advanced Norwegian. (3-3) Yr. _____
 Prerequisite: course 3A-3B or its equivalent.
 Intensive reading of masterpieces; composition and conversation.
- *111. Swedish Poets of the Nineteenth Century. (3) II. Mr. Janzén
 Prerequisite: a reading knowledge of Swedish.

II

COURSES WHICH REQUIRE NO KNOWLEDGE OF A SCANDINAVIAN LANGUAGE

- 100A-100B. History of Scandinavian Literature. (3-3) Yr. Mr. Janzén
 Survey course: reading of selected works of Danish, Swedish, and Norwegian literature in translation; lectures.
- *106. History of Scandinavian Drama. (3) I. Mr. Janzén
 Reading of Danish, Swedish, and Norwegian plays in translation; lectures.
107. The Plays of Ibsen. (3) II. Mr. Janzén
- *108. Strindberg and His Writings. (3) I. Mr. Janzén
- *113. Romanticism in Norway. (3) I. _____
 Study of the major works, in poetry and prose, of the Norwegian Romantic movement.
- *114. The Works of Holberg and Oehlenschläger. (3) II. _____
- 120A-120B. The Novel in Scandinavia. (3-3) Yr. Miss Schioler
 Great Danish, Swedish, and Norwegian novels read in translation; lectures on the development of the novel.

* Not to be given, 1951-1952.

125. Masterpieces of Old Norse Literature. (3) I. Mr. Janzén
The sagas and the Eddas in English translation; lectures on Scandinavian literature in the Middle Ages.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
Mr. Janzén, Miss Schioler

GRADUATE COURSE

298. Special Study for Graduate Students. (1-4) I and II. Mr. Janzén
Prerequisite: graduate standing in Scandinavian Languages.

SLAVIC LANGUAGES

Waclaw Lednicki, Ph.D., *Professor of Slavic Languages.*

Gleb Struve, B.A., *Professor of Russian.*

George R. Noyes, Ph.D., LL.D., Litt.D., *Professor of Slavic Languages, Emeritus.*

Oleg A. Maslenikov, Ph.D., *Associate Professor of Slavic Languages (Chairman of the Department).*

* Francis J. Whitfield, Ph.D., *Associate Professor of Slavic Languages.*

Lydia I. Pennell, A.B., *Associate in Russian.*



George C. Guins, LL.M., *Lecturer in Russian and Political Science.*

Ivan A. Mogilevsky, A.B., *Lecturer in Russian and Serbo-Croatian.*

Ludmila A. Patrick, M.A., *Lecturer in Russian.*

Michael K. Pawlikowski, LL.M., *Lecturer in Polish and Russian.*

Božena Pospíšilová, Ph.D., *Lecturer in Czech.*

Lawrence L. Thomas, M.A., *Lecturer in Polish and Russian.*

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: Mr. Whitfield.

The Major.—Required: 24 units, of which 12 units must be in upper division language courses in the Department of Slavic Languages and at least one lecture course in the department; not more than 6 units may be chosen from other departments. Courses in other departments that will be accepted as part of the major are upper division courses in the Greek, Latin, or Gothic languages, in phonetics or comparative linguistics, and any upper division courses in European literature, or in history, that may be specifically approved by the department as combining properly with the work in Slavic languages. Such courses are, for example, those given by the English Department on the novel and on nineteenth-century poetry, and by the History Department on modern European history, particularly the history of eastern Europe.

Honor Students in the Upper Division.—Candidates for honors must do at least 24 units of upper division work in the department, of which at least 12 units must be of grade A and the remaining 12 units must average not below grade B. The 24 units must include at least 18 units of work in upper division language courses in the department.

* In residence spring semester only, 1951-1952.

LOWER DIVISION COURSES

1. Elementary Russian. Beginners' Course. (4) I and II.
Mr. Thomas in charge fall semester; Mr. Whitfield in charge, spring semester.
Two lectures and three recitation hours per week. See also course 18A.
2. Elementary Russian (continuation of 1). (4) I and II.
Prerequisite: course 1. Mrs. Patrick, Mr. Maslenikov
Two lectures and three recitation hours per week. See also 18B.
3. Intermediate Russian. (2) II. Mrs. Patrick
Continuation of course 2. Reading, composition, translation.
- 6A-6B. Elementary Polish. (3-3) Yr. Mr. Thomas, Mr. Whitfield
- 10A-10B. Elementary Serbo-Croatian. (3-3) Yr. Mr. Mogilevsky
- 14A-14B. Elementary Czech. (3-3) Yr. Miss Pospíšilová
- 18A. Elementary Russian Conversation. (2) I and II. Mrs. Pennell
Prerequisite: course 1 (to be taken concurrently).
- 18B. Elementary Russian Conversation. (2) I and II. Mrs. Pennell
Prerequisite: course 2 (to be taken concurrently).

UPPER DIVISION COURSES

A. Language Courses

- 102A-102B. Second-year Russian. (3-3) Yr. Mr. Pawlikowski
Prerequisite: course 3, or course 2 with a grade of at least B.
- 103A-103B. Third-year Russian. (3-3) Yr. Mr. Struve, Mrs. Patrick
- 104A-104B. Fourth-year Russian. (3-3) Yr. Mr. Guins
- *105. Written Translation from Slavic Languages. (1-3) I and II.
The Staff (Mr. Maslenikov in charge)
May be taken only in combination with some other advanced course in Slavic languages.
- 107A-107B. Second-year Polish. (3-3) Yr. Mr. Pawlikowski, Mr. Thomas
- 108A-108B. Third-year Polish. (3-3) Yr. Mr. Pawlikowski
- *109A-109B. Fourth-year Polish. (3-3) Yr. Mr. Pawlikowski
- †111A-111B. Second-year Serbo-Croatian. (3-3) Yr. Mr. Mogilevsky
- 112A-112B. Third-year Serbo-Croatian. (3-3) Yr. Mr. Mogilevsky
- 115A-115B. Second-year Czech. (3-3) Yr. Miss Pospíšilová
- 116A-116B. Third-year Czech. (3-3) Yr. Miss Pospíšilová
- 119A-119B. Intermediate Russian Conversation. (2-2) Yr. Mr. Pawlikowski
- 120A-120B. Advanced Russian Conversation. (2-2) Yr. Mr. Pawlikowski
- *121. The Pronunciation of Russian. (2) I. Mr. Maslenikov

* Not to be given, 1951-1952.

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

122. The Russian Language. (2) II. Mr. Whitfield
Morphological and etymological structure.
- *123. Russian Syntax. (2) II. Mr. Whitfield
- 124A-124B. Advanced Russian Composition. (2-2) Yr. Mrs. Patrick
Open to students enrolled in Russian 103 or 104.
- 127C. Modern Russian Poetry. (2) II. Mr. Struve
Prerequisite: a knowledge of reading and conversational Russian.
Lectures to be in Russian.
- 129C. The Works of Gogol. (2) I. Mr. Lednicki
Prerequisite: a knowledge of reading and conversational Russian.
Lectures to be in Russian.
198. Advanced Group Work. (1-3) I and II.
The Staff (Mr. Maslenikov in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Maslenikov in charge)

B. Lecture Courses on Slavic Literature

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
Alexey, Tolstoy, Gladkov, Fadeyev, Fedin, Leonov, Sholokhov, Simonov, Aldanov, Nabokov, and others.
- *133A-133B. Russian Novelists of the Nineteenth Century (except Tolstoy and Dostoyevsky). (2-2) Yr. Mr. Lednicki
Prerequisite: course 130 or consent of the instructor.
- *133C. Dostoyevsky. (2) II. Mr. Lednicki
Prerequisite: course 130 or consent of the instructor.
- *133D. Tolstoy. (2) II. Mr. Lednicki
Prerequisite: course 130 or consent of the instructor.
- 133E. Turgenev. (2) II. Mr. Lednicki
Prerequisite: course 130 or consent of the instructor.
134. Russian Literature and Folklore. (2) II. Mrs. Patrick
Development of the literature, exclusive of the novelists, and general features of the folklore.
- *135. The Russian Drama. (2) II. Mrs. Patrick
Survey of Russian drama from the seventeenth century to the twentieth.

* Not to be given, 1951-1952.

- *138. Modern Russia. (2) I. Mr. Struve
Life and intellectual currents of modern Russia as reflected primarily in Russian literature.
140. Survey of Slavic Literatures, excluding Russian. (2) II. Mr. Whitfield
- *151. Polish Literature: Sixteenth to Eighteenth Centuries. (2) II. Mr. Lednicki
Polish writers of the Golden Age (sixteenth century); of the seventeenth century; and of the Renaissance of the eighteenth century.
- *152. Polish Romantic Poetry. (2) II. Mr. Lednicki
Mickiewicz, Slowacki, and Krasinski.
153. Polish Literature of the Post-Romantic Period. (2) II. Mr. Lednicki
Novelists of the period of Positivism, and Young Poland.
155. Mickiewicz. (2) I. Mr. Lednicki
(Formerly numbered 250.)
160. Survey of Czech and Slovak Literature. (2) I. Miss Pospíšilová
The development of Czech and Slovak literature from the sixteenth century to the present.
- *170. Survey of South Slavic Literature. (2) II. Mr. Whitfield
- 180A-180B. Survey of Russian Culture. (2-2) Yr. Mr. Guins
180A. Origin of Russian culture and its peculiarities. Eastern and Byzantine influences. Rapprochement with the West and development of a national consciousness, literature, art, religion, science, and social institutions in the seventeenth and eighteenth centuries.
180B. Development of Russian material, social, and spiritual culture since the beginning of the nineteenth century and its features before and after the Revolution.
182. History of Polish Culture. (2) II. Mr. Pawlikowski
Development of the arts, thought, and institutions of Poland.

GRADUATE COURSES

Language Courses

220. Comparative Slavic Linguistics. (2) II. Mr. Whitfield
- 224A-224B. Old Church Slavic. (3-3) Yr. Mr. Maslenikov
225. Old Church Slavic and Early Russian. (2) I. Mr. Maslenikov
Relation of Old Church Slavic to Russian and other Slavic languages.
- *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) II. _____
- *231. History of the Russian Language. (2) II. Mr. Whitfield

* Not to be given, 1951-1952.

Literature Courses

- | | |
|--|----------------|
| *237. Early Russian Literature. (2) II. | Mr. Maslenikov |
| *238. Eighteenth-Century Russian Literature. (2) I. | Mr. Struve |
| 240. Pushkin. (2) I. | Mr. Lednicki |
| 245. Studies in the Russian Novel. (2) II. | Mr. Lednicki |
| 246. Twentieth-Century Russian Literature. (2) II. | Mr. Struve |
| 247. The Russian Critics. (2) I. | Mr. Struve |
| 248. The Symbolist Movement. (2) II. | Mr. Maslenikov |
| 285. Studies in Russian Prose. (2) I.
Subject for 1951-1952: Gogol. | Mr. Lednicki |
| 287. Studies in Russian Poetry. (2) II. | Mr. Struve |
| 298. Individual Work. (1-4) I and II. | |

The Staff (Mr. Maslenikov in charge)

Graduate students will be offered opportunities for independent reading and study. Credit will be assigned according to the amount of work done.

SOCIAL WELFARE

Milton Chernin, Ph.D., *Professor of Social Welfare (Chairman of the Department)*.

Gertrude Wilson, M.A., *Professor of Social Welfare*.

†Walter Friedlander, Ph.D., *Associate Professor of Social Welfare*.

Davis McEntire, Ph.D., *Associate Professor of Social Welfare*.

Maurine McKeany, Ph.D., *Associate Professor of Social Welfare and Field Work Supervisor*.

Ruth Cooper, M.A., *Assistant Professor of Social Welfare*.

Gordon Hearn, Ph.D., *Assistant Professor of Social Welfare*.

Barbara E. Judkins, M.S., *Assistant Professor of Social Welfare*.

Martin B. Loeb, A.B., *Assistant Professor of Social Welfare, and Lecturer in Social Welfare, School of Nursing*.

Kermit T. Wiltse, D.S.W., *Assistant Professor of Social Welfare*.

Gertrude K. Reynolds, M.S.W., *Instructor in Social Welfare*.



Pearl H. Berman, M.S.S., *Lecturer in Social Welfare and Field Work Supervisor*.

Margaret M. Blenkner, M.A., *Lecturer in Social Welfare*.

Anna Maenchen, Ph.D., *Lecturer in Social Welfare*.

Ruth H. Morgan, M.S.W., *Lecturer in Social Welfare and Field Work Supervisor*.

Eli R. Movitt, M.D., *Lecturer in Social Welfare*.

Lydia Nolan, M.S., *Lecturer in Social Welfare and Field Work Supervisor*.

Ida Oswald, M.S.W., *Field Work Supervisor and Lecturer in Social Welfare, School of Nursing*.

Joann G. Schreiner, M.S.S., *Lecturer in Social Welfare and Field Work Supervisor*.

* Not to be given, 1951-1952.

† Absent on leave, 1951-1952.

- Margaret S. Schubert, M.A., *Lecturer in Social Welfare and Field Work Supervisor.*
 Elliot Studt, M.A., *Lecturer in Social Welfare and Field Work Supervisor.*
 Hasseltine Byrd Taylor, J.D., Ph.D., *Lecturer in Social Welfare.*
 Winifred R. Wardell, M.A., *Lecturer in Social Welfare.*
 Ernestine Wertheimer, M.S.S., *Lecturer in Social Welfare.*



Douglas G. Campbell, M.D., *Lecturer in Social Welfare, Assistant Clinical Professor of Psychiatry and Lecturer in Neuroanatomy in the School of Medicine.*

The School of Social Welfare administers a two-year graduate program of training for social work, leading to the degree of Master of Social Welfare. For information regarding admission to and requirements prescribed for the graduate program, see the ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE.

The department administers the group major in social welfare (in the College of Letters and Science), a preprofessional preparatory program, which is described on page 67.

Letters and Science List.—Courses 100, 106, 108, and 110A–110B are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

UPPER DIVISION COURSES

100. The Field of Social Welfare. (3) I and II. Miss Wardell
 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) II. Miss Wardell
 Prerequisite: course 110A (may be taken concurrently). Open only to seniors in the social welfare major.
 An introduction to the techniques or skills of social case work, social group work, and community organization, designed to acquaint undergraduates with the leading concepts of these methods and with the literature. Observational visits to agencies and institutions will be arranged.
106. Community. (2) II. Mr. Loeb
 The concept of community; the major institutions of the modern community; community surveys in the United States; how to study the community; the sociological background of "community organization."
- *108. Race Relations. (2) I. Mr. Loeb
 The composition and background of American population; biological, social, and cultural aspects of race; interracial tensions in America; techniques for improving race relations.
- 110A–110B. The Social Services. (3–3) Yr. Mr. Chernin
 Course 110A is prerequisite to 110B.
 110A. History of the development of the social services in England and the United States from the British Poor Law to the present.
 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.

* Not to be given, 1951–1952.

191. Function and Organization of the Modern Social Services. (2) I.
Mrs. Taylor
Designed primarily for graduate students who have not completed the group major in social welfare. Not available to those who have completed course 110A-110B.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
The Staff (Miss Wardell in charge)
Prerequisite: senior standing and approval of the major adviser.
Individual readings, research, and conferences with instructor in a field chosen by the student with approval of the instructor.

GRADUATE AND PROFESSIONAL COURSES

These courses are intended primarily for students enrolled in the graduate program of the department, and are limited to such students except by permission of the department.

201. Law and Social Welfare. (2) II.
Mrs. Taylor
Legal information for social workers; the sources of California laws. The courts of California; fundamentals of law governing domestic relations, neglected and dependent children, delinquents, landlord and tenant, etc.; problems of legal procedure.
- 202A-202B. Social Case Work. (2-2) Yr.
Mrs. Nolan, Mrs. Schreiner, Mrs. Schubert
Introduction to the study and practice of social case work.
203. Community Organization. (2) I.
Mr. Loeb
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.
Miss Cooper, Mr. Loeb
Basic facts, theories and problems in the physiological, psychological, and personality development of the individual as related to social work practice.
205A: From conception through adolescence.
205B: From adulthood through senescence.
Required of all students enrolled in the first graduate year in the School of Social Welfare.

- 251A-*251B. Public Assistance. (2-2) Yr.
Miss McKeany
251A. Critical analysis of modern concepts and policies of public assistance as part of the social security program of the United States. 251A will be given both semesters.
251B. Medical care; work relief programs; youth programs; rural relief and rehabilitation, relations with social insurance and other security measures; the prevention of destitution.

- 252A-252B. Public Welfare Administration. (2-2) Yr.
Mrs. Taylor
252A. The organizational structure of public welfare services in the United States, on federal, state, and local levels, and problems of reorganization.
252B. The administrative process within the public welfare agency. Problems of administration.

* Not to be given, 1951-1952.

- 253A-253B. Child Welfare. (2-2) Yr. Mr. Wiltse
 253A. The Field of Child Welfare: history and background of child welfare; changing conceptions of children's needs in the light of modern theory; special measures for the care and protection of dependent and neglected children; the organization and functions of public and private services for children.
 253B. Child Placing: principles and methods of child placing; adoptions; selection of substitute environments such as foster homes and institutions.
 253A will be given both semesters. 253B will be given fall semester only.
- 254A-254B. Medical Social Work. (2-2) Yr. Miss Cooper
 254A. The social component of illness; social case work in the medical setting.
 254B. The development, organization, and administration of medical social service functions in institutional and extramural settings.
- *255A-255B. The Medical Services. (2-2) Yr. Miss Cooper in charge
 255A. Advanced medical information regarding causes of disease, diagnosis, treatment, and prevention.
 255B. The public medical services. Policies and problems of organization, administration, and services.
- 257A-257B. The Treatment of Delinquency. (2-2) Yr. Mr. Chernin, Mrs. Studt
 257A. Institutional treatment; history and development of penal and correctional institutions for adults and juveniles; theories and programs of treatment; organization and administration of correctional services.
 257B. Noninstitutional treatment, probation, and parole; theory and development of probation, parole, and the indeterminate sentence; the organization and administration of parole and probation services.
- 258A*-258B. Advanced Social Case Work. (2-2) Yr. Mrs. Wertheimer, Miss Judkins
259. Principles and Methods of Supervision in Social Welfare. (2) II. Mr. Wilson
 Prerequisite: completion of one year of training in a recognized school of social work, including a case-work or group-work and field-work sequence.
 Educational and psychological principles involved in supervision; the purposes, possibilities, and current practices of supervision in social agencies; critical evaluation of supervising case material drawn from present practice.
262. Psychiatry and Social Work. (2) I. _____
 The diagnosis and treatment of the psychoneuroses, neuroses, psychoses, and mental deficiencies, and their social implications; the various schools of psychiatric thought.
263. Psychiatric Social Work. (2) I. Miss Judkins
 The practice of psychiatric social work; case work in the psychiatric setting; methods and procedures in handling cases; the organization and administration of psychiatric social work units.
 Limited to students specializing in psychiatric social work.

* Not to be given. 1951-1952.

*264. The Mental Hygiene Services. (2)

The mental hygiene movement and the basic principles of mental health; the development of specialized services for the mentally ill and deficient; commitment policies and procedures; the organization, functions, and administration of mental institutions and clinics; extramural programs.

265. Social Welfare Research. (2) I and II. Mr. McEntire, Miss Blenkner

Prerequisite: Economics 2 or Psychology 5 or the equivalent.

Fields and methods of social welfare research; techniques of collecting data; analytical methods.

266A-*266B. Emotional Development of Children. (2-2) Yr. Mrs. Maenchen

Course 266A is not prerequisite to 266B. 266A will be given in the spring semester.

266A. Dynamics of childhood behavior in conflicting situations; the contribution of psychoanalytic theory to social case work with children.

266B. Child development and family structure; the dynamics of the relationship between the social and cultural determinants of personality. This course is limited to students specializing in psychiatric social work.

280. Introduction to Social Group Work. (2) I and II. Mr. Hearn

For non-Group Work students in the School of Social Welfare and graduate students in other departments. 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.

281A-281B. Social Group Work. (2-2) Yr.

Miss Morgan

Primarily for Social Group Work students in the School of Social Welfare. Introduction to the study and practice of Social Group Work.

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) II.

Mr. Hearn

Professional, theoretical, and research problems in group work theory and practice. For advanced group work students.

*291. International Social Services. (2) II.

Mr. Friedlander

An examination of the international social agencies and their activities. Comparative analysis of the development and main characteristics of the system of public and private social services in selected foreign countries.

292. Cultural and Social Aspects of Social Welfare Practice. (2) II.

Mr. Loeb

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 relationship between the social insurances and social welfare programs.

* Not to be given, 1951-1952.

295. Seminar in Research Problems and Methods. (2) II. Mr. McEntire
Prerequisite: course 265 or equivalent, and consent of the 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, Mrs. Wertheimer
Individual or group study, with emphasis on original research, as may be arranged.
299. Special Research. (2) I and II. The Staff (Mr. McEntire in charge)
Group research on selected problems in social welfare. Open to candidates for the degree of Master of Social Welfare who have completed course 265 or the equivalent.
401. Field Work. (2-10) I and II. The Staff (Miss McKeany in charge)
Field work in social agencies under supervision, as prescribed and arranged by the staff. The normal program for first-year students is 400 hours of supervised work (two days per week during two semesters), for which 8 units of credit are granted; for less work, proportionately less credit is allowed. For second-year students advanced field practice in specialized types of social work, to be offered two or three days a week during each semester, or to be arranged in periods of continuous work, is normally required. Arrangements of field work vary in extent and credit in accordance with the needs of individual students.
410. Program Media in Social Group Work. (1) I and II. Miss Morgan
Enrollment limited to students in the School of Social Welfare.
Practice in various program media of importance to social group work; the meaning and use of skills in social group work programs.
- 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

- Edward Strong, Ph.D., *Professor of Philosophy (Chairman of the Department of Sociology and Social Institutions).*
- Reinhard Bendix, Ph.D., *Associate Professor of Sociology and Social Institutions.*
- * Wolfram Eberhard, Ph.D., *Associate Professor of Sociology and Social Institutions.*
- Robert A. Nisbet, Ph.D., *Associate Professor of Sociology and Social Institutions.*
- Kenneth E. Bock, Ph.D., *Assistant Professor of Sociology and Social Institutions.*
- * Seymour M. Lipset, Ph.D., *Assistant Professor of Sociology and Social Institutions.*
- Tamotsu Shibutani, Ph.D., *Assistant Professor of Sociology and Social Institutions.*
- Albert Pierce, Ph.D., *Instructor in Sociology and Social Institutions.*



Dorris West Goodrich, M.A., *Lecturer in Sociology and Social Institutions.*

² In residence spring semester only, 1951-1952.

* Absent on leave, 1951-1952.

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 69.

Departmental Major Adviser: Mr. Bock.

Preparation for the Major.—Required: courses 1, 2, 10A–10B. Recommended: Anthropology 2A–2B, Economics 1A–1B, 2, History 4A–4B, Philosophy 20A–20B, Psychology 1A–1B, 5.

The Major.—Required: 24 units in the upper division consisting of 6 units in each of the three groups A, B, and C under I, and 6 units from I and II, as approved by the departmental major adviser. The completion of the major will require the maintenance of a satisfactory grade average. The course in Social Statistics (106) is recommended for majors who have completed either Economics 2 or Psychology 5 prior to September, 1951. For majors who have not completed Economics 2 or Psychology 5, course 106 will be required beginning September, 1951.

LOWER DIVISION COURSES

1. Introduction to Sociology. (3) I. Mr. Pierce
 (Formerly numbered 2.)
 Principal concepts and theories: culture, personality, status, social group, community, etc. Emphasis will be upon the systematic presentation of the basic concepts and fields of investigation in contemporary sociology.
2. Social Organization. (3) II. Mr. Nisbet
 (Formerly numbered 1.)
 Comparative treatment of problems of social organization and change in Western and non-Western societies. Emphasis will be upon the social aspects of industrialization.

SOPHOMORE COURSE

- 10A–10B. Progress and Civilization. (3–3) Yr. Mr. Bock
 Historical and critical examination of leading ideas in the social sciences.

UPPER DIVISION COURSES

I

Group A: Method and Theory

- *101A–101B. Theories of Social Change. (3–3) Yr. _____
 101A. Critical analysis of geographical, racial, and economic theories of social progress.
 101B. Comparison of the procedures of investigation employed in studies of social evolution, in natural history, and history.
- 105A–105B. Introduction to Research Methods in Sociology. (3–3) Yr. Mrs. Goodrich
 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. Special emphasis upon integration of sociology and related disciplines.
106. Social Statistics. (3) I and II. Mrs. Goodrich
 An analysis of the basic procedures in statistical analysis of social data: frequency distributions, measures of central tendency and dispersion, correlations, measures of reliability and significance. Special attention to application of techniques to research problems. Enrollment limited to 25 students.

* Not to be given, 1951–1952.

107. Social Control. (3) I. Mr. Shibutani
 Systematic presentation of the point of view developed by Cooley, Dewey, Faris, Mead, Park, Riezler, Sapir, and Thomas for analysis of social conduct.
- *121. Historical Sociology. (3) I. Mr. Bock
 (Formerly numbered 121A.)
 Exposition and criticism of some major contributions in the field of historical sociology. Emphasis on leading figures such as Comte, Spencer, Spengler, Teggart, Sorokin, Toynbee.
122. Sociological Theory. (3) I. Mr. Nisbet
 (Formerly numbered 121B.)
 The emergence of sociology in the nineteenth century; relation of sociology to the other social sciences. Principal problems and concepts.
- *125. Contemporary Issues in Social Theory. (3) II. Mr. Bendix
 Development of social theory in Germany, especially with regard to the sociology of knowledge. Contributions to sociology by Max Weber, Karl Mannheim, and others will be examined.

Theory of Historical Inquiry (Philosophy 147). (3) I.

Group B: Historical and Comparative

The Nature of Culture (Anthropology 118A-118B). (3-3) Yr.

- 131A-131B. History of Social Institutions. (3-3) Yr. Mr. Bock
 Nine hours of laboratory per week.
 Research in selected fields of institutional history such as family, state, war, technology, art, music, religion; preceded by critical examination of representative works in the subject chosen.

- 141A-141B. History of Western Social Organization. (3-3) Yr. Mr. Nisbet
 (Formerly numbered 141.)
 An analysis of the changing position of the family and community in Western society; effects of war, industrialism, and nationalism upon these groups; background of contemporary problems.

- 142A*-142B. Comparative Institutions. (3-3) Yr. Mr. Eberhard
 (Formerly numbered 142.)
 Comparative treatment of social and political institutions in selected areas; relation of ideas to institutions; the state and social groups; emphasis on the problem of superstratification.

- *143. Social Change. (3) II. _____
 Review of theories and of the evidence of change and stability in various phases of contemporary civilization. Selected periods of outstanding social and cultural innovations will be considered.

144. Migration. (3) II. Mr. Pierce
 Examination of empirical data on spatial shifts of population; historical comparisons; special attention to the Pacific region; analysis of factors in migration, and critique of generalizations.

- *151A-151B. The History of Civilization. (3-3) Yr. _____
 Nine hours of laboratory per week.
 A study of historical changes in the civilization of selected areas.

* Not to be given, 1951-1952.

160. The City. (3) II. Mr. Shibutani
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.
- *166. Oriental Societies. (3) I. Mr. Eberhard
(Formerly numbered 166A.)
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
(Formerly numbered 166B.)
Main characteristics of Asiatic nomadic societies (Central Asia, Turks, Mongols, Middle East). Their contacts with non-nomadic cultures.

Group C: Social Processes and Relations

102. Social Problems of Large-Scale Organizations. (3) I. Mr. Bendix
The growth of large-scale organizations in business and government; social and psychological factors affecting human relations.
- *103. Social Structures. (3) I. _____
A comparative examination of social structures in the countries of contemporary Europe and America.
- *108. Sociology of Law. (2) II. _____
Study of legal systems of social groups in their relationships to social behavior. Emphasis upon empirical research by jurists and social scientists.
- The Professions and Modern Society (Education 108). (2) II.
- Rural Sociology (Agricultural Economics 112A-112B). (2-2) Yr. Mr. Taylor
130. Sociology of the Family. (3) I. Mr. Pierce
Interactions among family, society, and personality in western culture from ancient times to the present.
132. Social Stratification. (3) II. Mr. Bendix
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.
- 133A-133B. Population. (3-3) Yr. Mrs. Goodrich
Quantitative and qualitative study of populations throughout the world, dynamics of population, methods of analysis, and sources of information. Special emphasis on the articulation of population study with sociology.
137. Regional Sociology of the United States. (3) II. Mr. Pierce
Development of concept of "region." Analysis of the United States on a regional basis.
- Social Psychology (Psychology 145). (3) I and II.
- 148A-148B. Collective Behavior. (3-3) Yr. Mr. Shibutani
Crowd behavior, mass behavior, social movements, and the political process in modern urban societies.
- Living Races of Man (Anthropology 153). (3) I.

* Not to be given, 1951-1952.

154. Comparative Social Problems. (3) I. Mr. Pierce
Utilization of the comparative method in the investigation of such problems as race relations, exhaustion of natural resources, and morbidity, for selected areas of North America, South America, and Africa.
- *161. Community and Modern Industry. (3) II. Mr. Lipset
Institutional and ideological setting of industry; effects of size and composition of the community on industry and trade unions; social groupings in the community and the factory.
-
199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Bock in charge)

II

RECOMMENDED COURSES IN OTHER DEPARTMENTS

Group A: Method and Theory

- Economic Theory (Economics 100A-100B). (3-3) Yr.
- Ethics (Philosophy 104). (3) I.
- *Social Philosophy (Philosophy 108). (3) II.
- Political Philosophy (Philosophy 128). (2) I.
- Principles of Politics (Political Science 112A-112B). (3-3) Yr.
- Elements of Jurisprudence (Political Science 117). (3) I.

Group B: Historical and Comparative *

- History of Economic Doctrine (Economics 101A-101B). (3-3) Yr.
- Social Reform Movements (Economics 106A-106B). (3-3) Yr.
- Economic History Since 1850 (Economics 110). (3) I and II.
- Contemporary Civilization (Anthropology 160A-160B). (3-3) Yr.
- Social History of the United States (History 176A-176B). (3-3) Yr.

Group C: Social Processes and Relations

- Population and Migration (Economics 188A-188B). (3-3) Yr.
- Social Problems of Families (Home Economics 142). (3) II.
- Problems of Poverty (Economics 180). (3) I and II.
- Public Opinion (Political Science 114). (3) I.
- Personality (Psychology 148A). (3) II.
- Personality in Society and Culture (Psychology 141). (3) I.

GRADUATE COURSES

202. Seminar in Social Problems of Large-Scale Organization. (2) II.
(Formerly numbered 202A-202B.) Mr. Bendix
203. Seminar in Contemporary Social Theory. (2) I. Mr. Bendix

* Not to be given, 1951-1952.

480 *Sociology and Social Institutions; Spanish and Portuguese*

- 210A-210B. Seminar in Historical Sociology. (2-2) Yr. Mr. Bock
Prerequisite: consent of the instructor.
Problems and procedures in the sociological treatment of temporal social phenomena.
- *215A-215B. Interdepartmental Seminar. (2-2) Yr. The Staff
- *221A-221B. Seminar in Social and Historical Processes. (2-2) Yr. ———
- *235A-235B. Seminar in Non-European Cultural Stratification. (2-2) Yr.
Mr. Eberhard
Social, economic, and political relations between Central Asiatic cultures and Chinese or Middle Eastern cultures; relations between Chinese and Indo-Chinese cultures. Colonization.
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.
237. Seminar in Field Research. (2) II. Mr. Pierce
Prerequisite: consent of the instructor.
Applications of research techniques to the study of selected situationally defined groups.
- 241A-241B. Seminar in Social Organization. (2-2) Yr. Mr. Nisbet
Studies in the relationships of social groups to modern political and economic institutions.
248. Seminar in Collective Behavior. (2) I. Mr. Shibutani
An examination of the basic premises and research techniques of selected contemporary studies of collective behavior.
- *260. Seminar in Political and Industrial Sociology. (2) I. Mr. Lipset
Contributions of sociology to theory and research in politics and industrial relations. Analysis of structure and ideology of organized groups.
- *Seminar in Theories of History (Philosophy 247). (2) II.
299. Individual Study and Research. (3-6) I and II.
The Staff (Mr. Bendix in charge)

SPANISH AND PORTUGUESE

Erasmus Buceta, Doctor en Derecho, *Professor of Spanish.*

Charles E. Kany, Ph.D., *Professor of Spanish.*

José F. Montesinos, Licenciado en Filosofía y Letras, *Professor of Spanish.*

Lesley B. Simpson, Ph.D., *Professor of Spanish (Chairman of the Department).*

² Robert K. Spaulding, Ph.D., *Professor of Spanish.*

Arturo Torres-Rioseco, Ph.D., *Professor of Latin-American Literature.*

S. Griswold Morley, Ph.D., Litt.D., *Professor of Spanish, Emeritus.*

Beatrice Q. Cornish, Ph.D., *Assistant Professor of Spanish, Emeritus.*

Yakov Malkiel, Ph.D., *Associate Professor of Romance Philology.*

Edwin S. Morby, Ph.D., *Associate Professor of Spanish.*

* Not to be given, 1951-1952.

² In residence spring semester only, 1951-1952.

Fernando A. Alegria, Ph.D., *Assistant Professor of Spanish.*
 G. Arnold Chapman, Ph.D., *Assistant Professor of Spanish.*
 Dorothy C. Shadi, Ph.D., *Assistant Professor of Spanish.*
 Edwin J. Webber, Ph.D., *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.*

Letters and Science List.—All undergraduate courses are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

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 (with a grade of at least B); 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 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, and 115. Recommended electives: further study in French, Italian, Portuguese, and Latin, and History 160A–160B.

Requirements for Plan B: 24 units of upper division work in the department, including courses 104A–104B (6 units), 107A–107B (6 units), 113A–113B (4 units), 114A–114B (4 units). The remaining units may be completed from Portuguese 123, Spanish 102, 105, 110A–110B, 111A–111B, 112A–112B, and 115. Recommended electives: Spanish 103A–103B; History 161A–161B; French 112A–112B, French 121A–121B.

Students who fail to maintain at least an average grade of C in the Spanish courses taken in the upper division will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major.

The requirements for Plan A and Plan B (including preparation) apply to all students entering the upper division in September, 1948, and thereafter.

Honor Students in the Upper Division.—Candidates for honors must do distinguished work (B average or better) in their major programs.

Higher Degree.—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

SPANISH

LOWER DIVISION COURSES

Students whose native tongue is Spanish or Portuguese will not normally be admitted into any lower division courses in their respective language except 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.
Sections meet five hours per week. Mr. Webber in charge
Prerequisite: course 1 or two years of high school Spanish, or the equivalent.
3. Intermediate Spanish (continuation of 2). (4) I and II.
Sections meet five hours per week. Mrs. Shadi in charge
Prerequisite: course 2 or three years of high school Spanish, or the equivalent.
4. Intermediate Spanish (continuation of 3). (4) I and II.
Sections meet five hours per week. Mrs. Shadi in charge
Prerequisite: course 3 or four years of high school Spanish, or the equivalent.
- 25A-25B. Advanced Spanish. (3-3) Yr. Beginning each semester.
Mr. Alegría, Mr. Morby, Mrs. Shadi, Mr. Simpson
Required as preparation for the major.
Prerequisite: four years of high school Spanish, or course 3 (with a grade of at least B) or 4, or the equivalent.
25. Advanced Spanish. (5) II. Mr. Morby
Prerequisite: same as for 25A.
Alternative course to 25A-25B, designed for students entering in mid-year who wish to prepare themselves for entering the upper division the following fall.
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. Chapman

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. Montesinos
- 103B. Study of a Prose Genre of the Nineteenth Century. (3) II.
Mr. Montesinos
- 104A-104B. Spanish-American Literature. (3-3) Yr. Beginning each semester.
Required of majors in Plan B. Mr. Torres-Rioseco, Mr. Chapman
105. Modern Peninsular Drama: From the Romantic Movement to the Present. (3) I. Mrs. Shadi
- 107A-107B. History of Spanish Literature to 1680. (3-3) Yr.
Prerequisite: senior standing. Mr. Morby, Mr. Buceta
Required of majors in Plan A and Plan B.

- 109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries. (2-2) Yr. Mr. Montesinos
- 110A-110B. Twentieth-Century Peninsular Prose. (2-2) Yr. Mr. Buceta
- 111A-111B. Cervantes. (2-2) Yr. Mr. Simpson
- 112A-112B. A Survey of Spanish Culture. (2-2) Yr.
Required of majors in Plan A. Mr. Malkiel, Mr. Montesinos
- 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. Alegría
Required of majors in Plan B.
115. A Survey of Spanish Lyric Poetry. (3) II. Mrs. Shadi
- 116A-116B. Advanced Grammar and Composition. (3-3) Yr. Mr. Kany
Required only of candidates for the Certificate of Completion, teacher-training curriculum.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
Mr. Buceta and Mr. Spaulding in charge
I: Mr. Buceta; II: Mr. Spaulding.
Restricted to senior honor students, by previous arrangement with members of the departmental staff.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 139)

In the requirements for the master's degree this department follows Plan II.

- *201A-201B. History of the Spanish Lyric. (2-2) Yr. Mr. Buceta
- 202A-202B. History of the Spanish Novel to the End of the Seventeenth Century. (2-2) Yr. Mr. Buceta
- *204A-204B. La novela hispanoamericana. (2-2) Yr. Mr. Torres-Rioseco
206. Problems in American Spanish. (2) II. Mr. Kany
- *208A-208B. The Ballad. (2-2) Yr. _____
- *209A-209B. The Drama of the Golden Age. (2-2) Yr. _____
An intensive study of one author.
- 212A-212B. Old Spanish. (2-2) Yr. Mr. Malkiel
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

* Not to be given, 1951-1952.

- *218A-218B. Seminar in Spanish Diplomatic Paleography of the Sixteenth Century. (2-2) Yr. Mr. Simpson
225. Pronunciation. (2) I. Mr. Kany
299. Special Advanced Study. (1-4) I and II.
Mr. Buceta and Mr. Spaulding in charge
I: Mr. Buceta; II: Mr. Spaulding.
Restricted to candidates for higher degrees, by previous arrangement with members of the departmental staff.

PORTUGUESE

LOWER DIVISION COURSES

1. Elementary Portuguese. (4) I and II. Mr. Santos
Sections meet five hours per week.
2. Elementary Portuguese. (4) I and II. Mr. Woodbridge
Sections meet five hours per week.
Prerequisite: course 1 or oral command of the language.
- *21. Readings in Portuguese. (3) I and II. Mr. Woodbridge
Designed for advanced students in Romance languages who wish to gain a reading knowledge of Portuguese. Not open to students who have completed Portuguese 1 or 2.
- 25A-25B. Advanced Portuguese. (3-3) Yr. Mr. Woodbridge
Prerequisite: courses 1 and 2 or the equivalent, or consent of the instructor.
Required as preparation for upper division Portuguese.

UPPER DIVISION COURSES

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.

SPEECH

- C. Douglas Chrétien, Ph.D., *Professor of Speech.*
Gerald E. Marsh, M.A., *Professor of Speech (Chairman of the Department).*
Alan R. Thompson, Ph.D., *Professor of Speech and Dramatic Literature.*
Dwight E. Watkins, M.A., *Associate Professor of Speech, Emeritus.*
Arnold Perstein, Ph.M., *Associate Professor of Speech.*
Edward Z. Rowell, Ph.D., *Associate Professor of Speech.*
†David Rynin, Ph.D., *Associate Professor of Speech.*

* Not to be given, 1951-1952.

† Absent on leave, 1951-1952.

Jacobus ten Broek, J.S.D., *Associate Professor of Speech.*
 Edward N. Barnhart, Ph.D., *Assistant Professor of Speech and Lecturer in Psychology.*

- * Woodrow W. Borah, Ph.D., *Assistant Professor of Speech.*
 William Fearnside, LL.B., Ph.D., *Assistant Professor of Speech.*
 Richard Hagopian, M.F.A., *Assistant Professor of Speech.*
 William B. Holther, Ph.D., *Assistant Professor of Speech.*
 Isæbel Hungerland, Ph.D., *Assistant Professor of Speech.*
 Joseph Tussman, Ph.D., *Assistant Professor of Speech.*
 Garff B. Wilson, Ph.D., *Assistant Professor of Speech.*
 Don Geiger, Ph.D., *Instructor in Speech.*
 Ward E. Tabler, A.B., *Associate in Speech.*



- * Robert L. Beloff, M.A., *Lecturer in Speech.*
 Margaret Blackburn, M.A., *Lecturer in Speech.*
 Rebecca Hayden, M.A., *Lecturer in Speech.*
 Hypatia T. Hileman, A.B., *Lecturer in Speech.*
 Sinclair Kerby-Miller, Ph.D., *Lecturer in Speech.*
 Anthony Ostroff, M.A., *Lecturer in Speech.*
 Dorothy Pilgrim, M.A., *Lecturer in Speech.*
 Elizabeth Russell, Ph.D., *Lecturer in Speech.*
 Robert Schutz, M.A., *Lecturer in Speech.*
 William Shepard, M.A., *Lecturer in Speech.*
 Fred Stripp, M.A., Th.D., *Lecturer in Speech.*
 Angela Sullivan, M.A., *Lecturer in Speech.*
 Richard B. Wilson, M.A., *Lecturer in Speech.*

Students must have passed Subject A before taking any course in speech.

The courses in speech fall into two well-defined groups:

(a) *Oral Expression.* In this group come such courses as those in voice culture and oral interpretation of literature.

(b) *Logical Discourse—Expository and Argumentative.* Under this heading are grouped the courses covering the logical and rhetorical bases of those forms of discourse that are primarily addressed to the intellect. The field covered includes study of methods of investigation, analysis, briefing, the testing of evidence, and practice in oral presentation.

Generally speaking, students may choose courses in either group, or in both, but those students who elect speech for their major study are required to so arrange their courses as to cover the fundamentals in both phases of the work before taking advanced studies in their special 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 69.

Departmental Major Adviser: Mr. Tabler.

Preparation for the Major.—Students who wish to make speech their major subject must have completed, with an average grade of C or better, courses 1A-1B and 2A-2B. It is recommended that Philosophy 6A-6B be taken concurrently with course 1A-1B.

* Absent on leave, 1951-1952.

The Major.—Required: 24 units in upper division courses which must include 107A–107B, 110A–110B, and 111A–111B. Course 107A–107B should be taken in the junior year. Six of the 24 units required for the major may, with the approval of the departmental representative, be chosen from the following courses in English: 153A–153B, 114A–114B, 116, 117E, and 110; or the following courses in Philosophy: 104, 108, 112, 125, 128, 136A–136B, and 146.

Honors.—Candidates for honors at graduation must have completed the major with an average grade not lower than B.

LOWER DIVISION COURSES

1A–1B. Elements of Speech. (3–3) Yr. Beginning each semester.

Mr. Barnhart, Mr. Chrétien, Mr. Fearnside, Mr. Holther, Mr. Kerby-Miller, Mr. Marsh, Mr. Perstein, Mr. Rowell, Mr. Schutz, Mr. Shepard, Mr. Stripp, Mr. Tabler, Mr. ten Broek, Mr. Tussman, 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.

Miss Blackburn, Mr. Geiger, Mr. Hagopian, Miss Hayden, Mrs. Hileman, Mrs. Hungerland, Mr. Ostroff, Mrs. Russell, Mrs. Sullivan, Mr. Thompson, Mr. G. B. Wilson

Introduction to the oral reading of prose and poetry; practice in speaking and reading with training in the principles for effective delivery.

10. Logic of Argument. (3) I.

Mrs. Hungerland

An introduction to the problems of evidence and inference with emphasis on the application of logic to rational discussion of social problems.

12. Psychology of Argument. (3) I.

Mr. Barnhart

Primarily concerned with the function of communication in inducing belief and directing behavior; an introductory study of techniques used in political propaganda and other forms of persuasion.

25. Oral English for Foreign Students. (4) I and II.

Mrs. Pilgrim

For foreign students only. Pronunciation, speaking, grammar, reading, and writing of English. Required for those who fail to pass the Examination in English and who are not qualified to take course 26.

26. Oral English for Foreign Students. (4) I and II.

Mrs. Pilgrim

Continuation of and required for those who take course 25.

40. Advanced Oral English for Foreign Students. (3) I and II. Miss Hayden

Prerequisite: course 26 or consent of the instructor.

Practice in précis writing of advanced material, designed to improve the student's ability to grasp and restate meaning of material and to plan and present formal speeches.

UPPER DIVISION COURSES

103. 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. Geiger
Prerequisite: primarily for candidates for teaching credentials whose major is English; others admitted with consent of the instructor. Not open to students who have taken course 2A or 2B.
The study of poetry and prose from the point of view of oral interpretation. The principles of effective oral reading of literature; much practice in platform reading.
- 107A-107B. Argumentative Discourse: Oral and Written. (3-3) Yr. Beginning each semester. Mr. Kerby-Miller, Mr. Rowell, Mr. Holther, Mr. Fearnside, Mr. Tussman
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
Prerequisite: courses 1A-1B, 2A-2B, and 107A-107B.
- 111A-111B. The Reading of Prose and Poetry. (3-3) Yr. Beginning each semester. Miss Blackburn, Mr. Geiger, Mr. Hagopian, Mrs. Hungerland, Mr. Ostroff, Mr. G. B. Wilson
Prerequisite: course 2A-2B.
111A: The essay and the short story.
111B: The ballad, the lyric, the ode, etc.
- *117A-117B. Semantics. (3-3) Yr. Mr. Rynin
An examination of the nature and functions of language with special emphasis on the problems of meaning.
117A: The language of science.
117B: The language of values.
118. Symbolism: A Study of the Expressive Functioning of Signs. (3) II. Prerequisite: course 12 or consent of the instructor.
The nature of symbols, with special emphasis on their function in poetry.
119. Analysis of Communication Content. (3) II. Mr. Barnhart
Introduction to research techniques in communication with special emphasis on content analysis and audience response; individual and group research projects will be carried out by students under supervision.
- *120. The Use of the Library. (3) II. Mr. Borah
Open to sophomores.
Efficient and critical use of research materials and library facilities through preparation of research papers on current world problems.
132. Classical Rhetoric. (3) I. Mr. Holther
A study of rhetoric based on the writings of Plato, Aristotle, and other writers, with reference to criticism, aesthetic theory, and speech in the Classical era.
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.

* Not to be given, 1951-1952.

- *135. British Public Address During the Eighteenth and Nineteenth Centuries. (3) II. Mr. ten Broek
 Critical analysis of speeches of Burke, Pitt, Peel, Cobden, Bright, Gladstone, Disraeli, Newman, Huxley, Mill, and others. Attention given to issues with which they were identified and their relationship to the social movements of their time.
137. American Public Address During the Eighteenth and Nineteenth Centuries. (3) I. Mr. ten Broek
 Critical analysis of speeches of Randolph, Williams, Franklin, Washington, Hamilton, Marshall, Calhoun, Webster, Emerson, Lincoln, Douglas, and others.
138. Modern Public Address. (3) II. Mr. ten Broek
 Critical analysis of speeches of Wilson, Roosevelt, Churchill, and other leaders from 1914 to the present time.
139. Modern Spokesmen. (3) I. Mr. Tussman
 An examination of the writings and speeches of leading spokesmen for major contemporary movements—political, social, and religious—with special reference to problems of ideology and ideological conflict, objectivity and evaluation, and the rationalization of conflict.
152. Debate. (2) I and II. Mr. ten Broek, Mr. R. 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

Committee in charge:

Philip F. Griffin, M.A., *Associate Professor of Journalism.*

Karl Aschenbrenner, Ph.D., *Assistant Professor of Philosophy.*

R. Bertrand Evans, Ph.D., *Assistant Professor of English and Education.*



Phil S. Grant, M.A., *Supervisor of Instruction in Subject A.*

Subject A. (No credit) I and II. Mr. Grant and Assistants
 Three hours weekly.

Required of all students who do not pass the examination in Subject A. Fee, \$20. To those students who maintain an average grade of A during the first seven weeks of the semester half of the fee will be refunded, and they may discontinue attending the course. For the regulations governing this requirement, see page 32.

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.

* Not to be given, 1951-1952.

ZÖÖLOGY

- Richard M. Eakin, Ph.D., *Professor of Zoölogy.*
 Harold Kirby, Ph.D., *Professor of Zoölogy (Chairman of the Department).*
 Alden H. Miller, Ph.D., *Professor of Zoölogy and Director of the California Museum of Vertebrate Zoölogy.*
 Paul R. Needham, Ph.D., *Professor of Zoölogy.*
 Curt Stern, Ph.D., *Professor of Zoölogy.*
 Richard Goldschmidt, Ph.D., M.D., Sc.D., *Professor of Zoölogy, Emeritus.*
 Samuel J. Holmes, Ph.D., LL.D., *Professor of Zoölogy, Emeritus.*
 Joseph A. Long, Ph.D., *Professor of Embryology in the Institute of Experimental Biology, Emeritus.*
 Seth B. Benson, Ph.D., *Associate Professor of Zoölogy and Curator of Mammals, California Museum of Vertebrate Zoölogy.*
 Kenneth B. DeOme, Ph.D., *Associate Professor of Zoölogy and Director of the Cancer Research Genetics Laboratory.*
 Jonas E. Gullberg, A.B., *Associate Professor of Metrology.*
 Morgan Harris, Ph.D., *Associate Professor of Zoölogy.*
 Daniel Mazia, Ph.D., *Associate Professor of Zoölogy.*
 William E. Berg, Ph.D., *Assistant Professor of Zoölogy.*
 *Howard A. Bern, Ph.D., *Assistant Professor of Zoölogy.*
 A. Starker Leopold, Ph.D., *Assistant Professor of Zoölogy and Conservationist, California Museum of Vertebrate Zoölogy.*
¹ Oliver P. Pearson, Ph.D., *Assistant Professor of Zoölogy and Assistant Curator of Mammals, California Museum of Vertebrate Zoölogy.*
 Frank A. Pitelka, Ph.D., *Assistant Professor of Zoölogy and Curator of Birds, California Museum of Vertebrate Zoölogy.*
 Ralph I. Smith, Ph.D., *Assistant Professor of Zoölogy.*
 Robert C. Stebbins, Ph.D., *Assistant Professor of Zoölogy and Curator in Herpetology, California Museum of Vertebrate Zoölogy.*
 Max Alfert, Ph.D., *Instructor in Zoölogy.*
 Willard D. Hartman, Jr., Ph.D., *Instructor in Zoölogy.*
 Helen B. Jordan, M.S., M.A., *Associate in Zoölogy for the spring semester.*
 Gerson M. Rosenthal, Jr., M.A., *Associate in Zoölogy for the spring semester.*
 Robert L. Rudd, M.A., *Associate in Zoölogy.*
 Robert Samuels, M.A., *Associate in Zoölogy.*
 Elizabeth Scott, M.A., *Associate in Parasitology for the fall semester.*



- Adriano Buzzati-Traverso, Sc.D., *Visiting Professor of Zoölogy for the fall semester.*
 Henry I. Hirshfield, Ph.D., *Lecturer in Zoölogy for the spring semester.*
 Frances M. Weesner, M.A., *Lecturer in Zoölogy.*

Letters and Science List.—All undergraduate courses in Zoölogy except courses 109 and 145 are included in the Letters and Science List of Courses. For regulations governing this list, see page 69.

Departmental Major Adviser: Mr. Harris.

* Absent on leave, 1951-1952.

¹ In residence fall semester only, 1951-1952.

Preparation for the Major.—Required: courses 1A, 1B, Chemistry 1A, and either Chemistry 1B or 8. Recommended: German, French, and elementary courses in other biological and physical sciences.

The Major.—Required: (1) 24 units of upper division courses in Zoölogy. (a) For 6 of these units substitutions may be made from upper division courses in bacteriology, biochemistry, botany, organic chemistry, entomology, genetics, microscopic anatomy, paleontology, physiology, physical chemistry, and physics. (b) Honor students whose major is zoölogy may be permitted a broader selection of related courses, and may under special circumstances make substitution for more than 6 units. (2) At least a 1.5 average in upper division courses included in the major.

LOWER DIVISION COURSES

- 1A. General Zoölogy. (4) I and II. Mr. Harris, Mr. Alfert, Mr. Samuels
I: Mr. Harris, Mr. Samuels; II: Mr. Alfert, Mr. Samuels.
Lectures and laboratory.
Prerequisite: Chemistry 1A.
An introduction to the principles of biology with special reference to structure, physiology, heredity, and evolution of animals.
- 1B. General Zoölogy. (4) II. Mr. Hirshfield, Mr. Rudd
Lectures and laboratory.
Prerequisite: course 1A.
An introduction to vertebrate zoölogy. Structure, function, development, and history of the vertebrate body.
4. Microscopic Technique. (2) I and II. Miss Weesner
Laboratory.
Prerequisite: course 1A and elementary chemistry.
10. General Biology. (3) I and II. Mr. Smith, Mr. Eakin
I: Mr. Smith; II: Mr. Eakin.
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. Rudd
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) II. Mr. Berg
Prerequisite: course 1B.
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.
- *103C. Experimental Embryology Laboratory. (2) II. Mr. Eakin, Mr. Berg
Prerequisite: course 100 or 103, and 123. (Courses 103 and 123 may be taken concurrently with 103C.)
Descriptive and experimental embryology of the invertebrates; studies of determination, differentiation, and regulation in the vertebrate embryo. Enrollment limited to ten students.
105. Growth and Form. (2) II. Mr. Harris
Prerequisite: course 1B. Recommended: Chemistry 8.
The mechanics and regulation of body growth; repair, ageing, and abnormal growth of adult tissues as studied in regeneration, transplantation, and tissue culture.
106. Comparative Anatomy of the Vertebrates. (4) II.
Lectures and laboratory. Mr. Harris, Mr. Rosenthal
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).
109. Biological Examination of Water. (1) II. Mr. Hartman
Microorganisms, other than bacteria, in relation to water supplies.
Restricted to students in sanitary engineering.
110. Biology of the Protozoa. (4) II. Mr. Kirby, Miss Jordan
Lectures and laboratory.
Prerequisite: course 1A and upper division standing. Recommended: course 119A, Botany 1A.
Study of free-living and symbiotic lower organisms included in this division of living things, with regard to morphology, physiology, development, and biological significance other than applied vertebrate parasitology. Laboratory work, including microscopy, cytological technique, culture technique, and study of living and prepared material.
- *111. General Animal Parasitology. (4) I. Mr. Kirby
Lectures and laboratory.
Prerequisite: course 1A and upper division standing.
Characteristics, life histories, and host relationships of animal parasites in general, an extended study of helminths, and an account of other parasites excepting higher arthropods.

* Not to be given, 1951-1952.

112. Invertebrate Zoölogy. (4) II. Mr. Hartman
Lectures, laboratory, and field work.
Prerequisite: course 1A.
Anatomy, classification, and natural history of common invertebrate animals.
Given also at the seashore in Summer Session I.
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. Buzzati-Traverso
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 the consent of the instructor.
An analytical study of direct and alternating current circuits and instruments used in biological research.

* Not to be given, 1951-1952.

- *121. Advanced Physicochemical Biology. (2) I. Mr. Mazia
Prerequisite: course 101 or consent of the instructor. Recommended: biochemistry.
The organization and functions of the cell surface and cytoplasm examined at the molecular level. The methods and results of cytochemical research.
122. Advanced Physicochemical Biology. (2) II. Mr. Mazia
Prerequisite: same as for 121. Recommended: genetics or cytology.
The physical and chemical study of the cell nucleus in relation to cell maintenance, reproduction, and heredity.
123. Invertebrate Embryology. (2) I. 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. Experimental Invertebrate Zoölogy. (4) I. Mr. Smith
Lectures and laboratory.
Prerequisite: course 112 or consent of the instructor.
Comparative physiology of the invertebrates, with individual laboratory problems on nutrition, respiration, excretion, coördination, and other functions.
125. General Ecology. (2) II. Mr. Pitelka
Prerequisite: two semesters of upper division work in biology, or graduate status in a related field.
Study of terrestrial communities, succession, effects of physical gradients, food chains, and population dynamics.
- 125C. Field Ecology. (2) II. Mr. Pitelka
Prerequisite: courses 112 or 113 or equivalent, 125 (may be taken concurrently), and Botany 108.
Study of distribution, composition, and dynamic relations of terrestrial communities in central California; problems of faunal analysis in relation to vegetation; descriptive and quantitative methods. Enrollment limited to ten students.
- *128. Vertebrate Reproduction. (3) II. Mr. Pearson
Lectures and laboratory.
Prerequisite: courses 100 and 113.
The reproductive biology of native vertebrate animals with special emphasis on mammals. Comparison of cycles and factors influencing reproductive physiology in natural populations.
135. Systematic Mammalogy. (2) I. Mr. Benson
Lecture and laboratory.
Prerequisite: courses 106 and 113.
Principles of classification and nomenclature; anatomy, relationships, and distribution of mammalian groups.

* Not to be given, 1951-1952.

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.
140. Internal Animal Parasites of Man. (4) I. Mr. Kirby, Mrs. Scott
 Lectures and laboratory.
 Prerequisite: course 1A, or equivalent basic work, and consent of the instructor. Recommended: course 119A.
 The protozoan and helminth parasites of man, including their host relationships and significance. Laboratory study of materials and methods in protozoölogy of the human host, and of significant helminthological material.
- *142A. Advanced Invertebrate Zoölogy. (4) II. Mr. Hartman
 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. Kirby in charge)
 Prerequisite: senior standing with at least a B average in upper division courses in zoölogy; background courses in chosen subjects.

GRADUATE COURSES

For admission to a graduate course a student should have permission of the instructor (which may be given to graduate students and seniors with not less than a B average), and should have 12 units of basic upper division work.

* Not to be given, 1951-1952.

208. Seminar in Invertebrate Zoölogy. (2) I. Mr. Hartman
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, Mr. Hartman
Given at the seashore in Summer Session I.
- *218. Seminar in Comparative Endocrinology. (1) II. Mr. Bern
Prerequisite: graduate standing and course 118 or the equivalent.
Discussion of current literature and review articles.
219. Seminar in Animal Ecology. (1) I. Mr. Pitelka
Prerequisite: course 125 or consent of the 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.
222. Seminar in Wildlife Management and Population Dynamics. (2) II. Mr. Leopold
Prerequisite: courses 116 and 145 or consent of the instructor.
Review of current research by students; review of literature and special topics.
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 by students.
224. Research. (1-8) I and II. The Staff (Mr. Kirby in charge)
Original study on special topics in laboratory, field, and museum. The work may be carried on in the laboratories at Berkeley, or 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. Berg in charge, fall semester;
Mr. Leopold in charge, spring semester)
Meetings for the presentation of original work by the faculty, visiting lecturers, and graduate students.
241. Seminar in Protozoölogy and Parasitology. (2) I. Mr. Kirby
242. Seminar in Experimental Morphogenesis. (2) I. Mr. Eakin, 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) II. 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) I. Mr. Buzzati-Traverso
Prerequisite: graduate standing and a course in genetics.
Topics will vary from year to year.

* Not to be given, 1951-1952.

299. Special Study for Graduate Students. (1-4) I and II.

The Staff (Mr. Kirby in charge)

Prerequisite: graduate status in zoölogy and consent of the instructor.

Any properly qualified graduate student who wishes to pursue a problem through reading or other advanced study may do so if his proposed project is acceptable to a member of the staff.

MUSEUM OF VERTEBRATE ZOÖLOGY

This Museum, situated in the Life Sciences Building on the Berkeley campus, was founded and endowed by 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 20, 1951) by a total of 296,262 catalogue entries. The specimens, with the accompanying field notes, photographs, and maps, provide the bases for studies along systematic, evolutionary, ecologic, and economic lines. Persons interested in employing the facilities of the Museum may address the Director.

INDEX

- A, Subject, 32, 488
Abbreviations used, 139
Absence, leave of, 41
Academic colleges, 13
Academic Senate, 13
Accounting, courses in, 217, 218, 222
Accrediting of schools in California, 20
Acoustics, 290, 424
Administration of the University, 13
Administrative staff, 7-10
Admission, by examination, 22, 26
 deficiencies, removal of, 22, 24
 from foreign countries, 26
 in advanced standing, 24
 in freshman standing, 20
 in graduate standing, 27
 in undergraduate status, 20
 late admission, 27
 of returning members of armed forces, 26
 of special students, 26
 preparation for, 22
Advanced standing, 20, 24, 52
Advertising, courses in, 220, 354, 450
Advisers, in the College of Letters and
 Science, 52
 for foreign students, 10, 27
Aeronautics, 95
Aesthetics, 412, 414
Agricultural, economics, 72, 78, 149, 164
 chemistry, 149, 164
 education, 72, 79
 engineering, 89, 152, 164
Agriculture
 College of, at Davis, 13
 College of, at Los Angeles, 12
 College of, at Riverside, 13
 courses in, 141
 curricula of the College of, 13, 71
 high school preparation recommended, 71
 honors, 82
 minimum scholarship requirements, 37
 requirements for degree, 72
Agronomy, 152, 165
Air conditioning, 95
Airphoto interpretation, 281, 325
Air science and tactics, 181
Air transportation, 221
American civilization, group major in, 57
American history and institutions, 33, 122
Anatomy, 184
Animal husbandry, 165
Animal science, 73, 79
Announcement of courses, 139
Anthropology, 186
 museum, 191
Apiculture, 170
Application fee, 20, 28
Applied Sciences, Colleges of, 13
Appointment registry for teachers, 49
Approved lodging houses, 46
Arabic, 394
Archaeology, 187, 189, 236, 239
Architecture
 courses in, 191
 curriculum of the School of, 14, 102
 graduate in, 14, 101, 102
 library, 19
 Master of Arts in, 101
 minimum scholarship requirements, 38
Art, courses in, 195
 University Gallery, 200
Arts, requirements for degree of Bachelor
 of, 55
Associate in Arts degree, 53
 honorable mention with, 55, 70
Associated Students, 43, 44
Assyrian, 394
Astronomy, 12, 13, 201
Attorney for the Regents, 7, 45
Audio-visual education, 267
Authority of instructors, 35
Automotive engineering, 95

Bacteriology, 12, 166, 204
Bancroft Library, 19
Biochemistry, 12, 206
Biology (*see* Botany, Physiology, Zoölogy)
Biology Library, 19
Bioradiology, 17
Board and lodging, 46, 48
Bohemian, 467
Books and stationery, 43
Botany, 12, 167, 210
Bowles Hall, 47
Brief leave, 41
Buddhism, 406
Bureau, of Business and Economic
 Research, 11
 of International Relations, 11, 19, 443
 of Occupations, 48
 of Public Administration, 11, 19, 443
 of School and College Placement, 49
Business administration
 courses in, 167, 215
 curriculum of the School of, 14, 102
 minimum scholarship requirements, 38

Calendar, 2, 3
California Museum of Vertebrate Zoölogy,
 11
California School of Fine Arts, 12
Candidacy for degrees, 2, 3, 35
Celtic, 314
Ceramic engineering, 98, 298
Certificate of Completion, teacher-training
 curriculum, 14, 109
Change of college or major, 36, 52
Chemical engineering, 84, 230
Chemistry
 basic chemistry, major in, 83
 courses in 167, 224
 curricula of the College of, 13, 82

- Chemistry—(*Continued*)
 food chemistry, 75
 high school preparation recommended, 82
 honors in, 82
 library, 19
 minimum scholarship requirements, 38
- Child development, 58, 75, 232
 and family relationships, 347, 350
- Chinese, 403
- Citrus Experiment Station, 13
- City and regional planning, 12, 17, 158, 173, 239
- Civil engineering, curriculum in, 91
 courses in, 277
- Civilization of the middle ages, group
 major in, 58
- Civilization of the nineteenth century,
 group major in, 58
- Classics, 12, 235
- Classification of courses, 139
- Climate of Berkeley, 43
- Clothing and textiles, 75, 348, 350
- College Entrance Examination Board,
 22, 25
- Colleges, and departments of the University,
 11-13
 change of, 36
- Communication engineering, 14, 93
 courses in, 288
- Communication and public policy, group
 major in, 58
- Comparative literature, 239
- Composition, English, required, 32
 of the University, 11
- Condition examination, 40
- Coöperatives, 46
 courses on, 150, 164
- Coptic, 395
- Correspondence instruction, 18
- Courses, classification of, 139
- Cowell, Ernest V., Memorial Hospital, 31
- Credentials, teachers', 109
- Credit, regulations concerning, 36
 by examination, 39
 definition, 139
 upon repetition of lower division course,
 40
- Criminology, School of, 12, 14, 105
 admission, 105
 courses in, 240
 degrees in, 105, 109
 minimum scholarship requirements, 38
 preparation for, 105
- Crocker Radiation Laboratory, 11
- Curricula, survey of, 13-17
- Czech, 467, 469
- Dairy industry, 168
- Danish, 465
- Deans in the academic colleges, 8, 9
- Debating, 486, 487, 488
- Decorative art, 12, 243, 350
- Deficiencies, admission, 22
 in university courses, 40
- Degrees conferred in the several colleges
 and schools, 13-17
 dates of application for, 2, 3, 35
 regulations concerning, 35
- Dental hygienists, curriculum for, 16, 86
- Dental service, 31
- Dentistry, College of, 12, 16, 85
 high school preparation recommended, 85
 tuition fee, 44
- Departments of instruction, 12
- Design (*see* Landscape Architecture, Engi-
 neering, Architecture, Art, and Deco-
 rative Art)
- Dietetics, 17, 76, 137, 346, 350
- Discipline, 42
- Discontinuance without notice, 41
- Dismissal, honorable, 41
 for scholarship delinquency, 37
- Dormitories, 46, 47
- Dramatic art, 12
 courses in, 246
 major in dramatic literature, 59
- Drawing (*see* Art, Engineering)
- Dutch, 336
- Economics
 agricultural, curriculum in, 78
 courses in, 169, 249
 of food consumption; 150
 of labor, 220, 253, 255
 social, 67, 135
- Education, degrees, Master or Doctor of, 15
 courses in, 169, 256, 398
 School of, 14, 109
 special, 269
 supervised teaching, 266
- Egyptian, 394
- Electrical engineering, 14, 93, 95, 285
- Employment, 48, 49
- Engineering, College of, 11, 14, 87
 aeronautics, 95
 agricultural, 89, 91
 air conditioning, 95
 automotive, 95
 business administration, 93
 ceramic, 98, 298
 chemical, 84
 civil, 89, 91, 277
 communications, 93
 construction, 92
 coöperative study program, 98
 courses in, 169, 270
 degree requirements, 90
 design, 12, 291
 electrical, 89, 93, 95, 285
 examination required, 88
 Freshman Status Examination, 88
 high school preparation recommended, 87
 honors, 99
 illumination, 93
 industrial, 89, 95, 98
 industrial electronics, 93
 intercampus transfer, 88
 irrigation, 92, 172, 283

- Junior Status Examination, 88
 library, 19
 marine and naval architecture, 95, 294
 mechanical, 89, 94, 174, 298
 mechanical design, 95
 metallurgy, 89, 96, 299
 mineral exploration, 14, 89, 96
 mineral technology, 12, 298
 mining, 89, 97, 303
 petroleum, 89, 97, 304
 photography, 277
 physics, 89, 93
 power, 93
 process engineering, 90, 98
 qualifying examination, 24
 sanitary and municipal, 92
 scholarship requirements, 38
 structural, 92
 thermodynamics, 95
 transportation and traffic, 92, 98, 306
 English, examination in, for foreigners, 27
 composition, 32
 comprehensive examination, 318
 courses in, 169, 308
 for admission, 21, 32
 required for Associate in Arts degree, 54
 Enology, 179
 Enrollment limitation, 25, 85, 88, 122
 Entomology, and parasitology, 74, 79, 152, 170, 180
 Entrance requirements, 20-27
 Examinations
 condition or special, 40
 credit by, 39
 entrance, 22, 25
 for foreign students, 27
 medical, required, 30
 regulations concerning, 39
 Excuse for absence, 41
 Expenses of students, 43
 Explanatory note, 139
 Extension, University, 11, 18, 23, 55, 56, 140

 Faculty advisers, 52
 Failures and conditions, 37, 40
 Family economics, 75, 348, 350
 Family relationships, courses in, 347, 350
 Farm management, 151, 164
 Fees, application, 20, 28
 commutation of, 45
 condition examinations, 40
 exempt from tuition, 45
 for Subject A course, 32
 general, 43
 incidental, 44
 laboratory, 44
 late registration, 27
 nonresident, 45
 professional schools, 44
 refunds, 45
 tuition, 45
 Fellowships and scholarships, 50
 Fernwald halls, 47

 Final examinations, regulations concerning, 39
 Finance, 150, 218, 253
 Fine Arts, California School of, 12
 for Associate in Arts degree, 54
 Food chemistry and technology, 75
 Food science, 74
 Food technology, 74, 75, 79, 155, 170, 345, 350
 Foreign language, credit in, for foreign students, 27
 for admission, 21, 22
 in the College of Chemistry, 82, 83
 required for Associate in Arts degree, 53
 Foreign literature, 316
 Foreign students
 admission from foreign schools, 26
 adviser, 27
 American History and Institutions, 33
 courses for, 486
 examination in English for, 27
 language credit in mother tongue, 27
 living accommodations, 46
 special advisers for, 27
 Forestry, School of, 15, 37, 114
 courses in, 317
 degree requirements, 115
 library, 19
 preforestry program, 116
 scholarship requirements, 38
 Fraternities, 48
 French, 12, 171, 321

 Gallery, University Art, 200
 General curriculum, 51, 56
 General Elementary, Junior High School credentials, 112
 General information, 43
 General Secondary credential, 110
 Genetics, 156, 171, 492, 495
 Geography, 12, 324
 Geological sciences, 12, 171, 327
 Geophysics, 328
 German, 12, 171, 333
 Gothic, 337
 Government
 courses in, 436
 of the University, 13
 student self-government, 42
 Grade points, 37
 Grades of scholarship, 37
 Graduate Division, 27, 39, 138
 Graduate fellowships and scholarships, 50
 Graduate in Architecture, degree of, 14, 101, 102
 Greek, 12, 236, 237
 Group majors, 57-69
 Gymnasiums, 31

 Hastings College of The Law, 12, 16
 Health service, 31
 Hebrew, 394
 Heller Committee for Research in Social Economics, 11

- High school program required for admission, 21
- Higher degrees, 138
- History
 courses in, 171, 337
 for admission, 21
 for graduation, 33
- Home economics
 courses in, 344, 398
 curriculum in, 75, 80
- Home furnishing, 348
- Honorable dismissal, 41
- Honorable mention, with the degree of Associate in Arts, 55, 70
- Honors, 36, 55, 70, 71, 82, 99, 102, 105, 134
- Hooper Foundation (for medical research), 12, 28
- Horticulture (*see* Pomology)
- Hospital, Ernest V. Cowell Memorial, 31
 dietetics, 17, 137
 University, 12, 15.
- Household science, major requirements (*see* Home economics), 75
- Housing, 46-48
 courses in, 194, 350
- Hydraulic engineering, 95
- Hydrology, 281
- Hygiene (*see* Public health)
- Illumination, 93
- Incidental fee, 44
- Indefinite leave of absence, 41
- Industrial electronics, 93
- Industrial engineering, 89, 94, 95
- Institute, of Child Welfare, 11
 of East Asiatic Studies, 11
 of Engineering Research, 11
 of Experimental Biology, 11
 of Geophysics, 11
 of Industrial Relations, 11, 138
 of Slavic Studies, 11, 138
 of Transportation and Traffic Engineering, 12
- Instruction, organization of, 11-17
- Instructors, authority, 35
- Insurance, 219, 253, 373
- Interior decorating, 244, 350
- International House, 48
- International Relations, Bureau of, 11, 19, 443
 courses in, 434
 major in, 60
- Irish, 314
- Irrigation, 92, 172, 283
- Irrigation science, 76, 80
- Italian, 12, 351
- Japanese, 403
 art, 197, 199, 200
- Journalism, 12, 17, 352
- Judicial Committee, 42
- Junior College credential, 112
- Junior High School credential, 112
- Jurisprudence (*see* Law)
- Korean, 403
- Labor and industrial relations, group major in, 60
- Laboratory fees, 44
- Laboratory science, for Associate in Arts degree, 53
 for admission, 21
- Laboratory technicians, 123, 124, 132
- Landscape architecture, 76, 81, 158
- Landscape gardening, 173
- Lange Library, 19
- Langley Porter Clinic, 12
- Languages, credit in, for a foreign student, 27
 foreign, for admission, 21
 for the Associate in Arts degree, 53
- Late registration, 27
- Latin, 12, 238
- Law, School of, 15, 118
 admission test, 119
 business, courses in, 217, 218
 courses in, 355, 432
 degrees in, 15, 16
 Hastings College of The, 12, 16
 preparation for, 118
- Leave of absence, 41
- Letters and Science, College of, 51
 high school preparation recommended, 22
 honors, 70
 list of courses, 69
 requirements for degrees in, 53-56
 requirements for majors in, 53-69
 scholarship requirements, 38
 study-list regulations, 52
- Librarianship, courses in, 358
 School of, 15, 121
- Library, 19
 course in the use of, 487
- Lick Astronomical Department, 13, 28, 203
- Limitation of enrollment, 25, 85, 88, 122
- Limits, study-list, 35, 52, 82
- Linguistics, 237, 316, 363
- Living, accommodations, 46-48
 expenses, 46
- Loans, 50
- Location of campus, 43
- Lodging and board, 46
- Logic, 412
 mathematical, 368
- Los Angeles, departments at, 12
- Los Angeles, Medical Department, 12
- Los Angeles, University of California at, 17
- Lower division
 in the College of Letters and Science, 53
 courses defined, 139
- Majors, change of, 36, 52
 for the A.B. degree, 56
 in the College of Agriculture, 72
 in the School of Education, 109
- Manufacturing, 276

- Marine and naval architecture, 95
 Marine engineering, 95
 Marketing, 150, 220
 Mathematics, courses in, 178, 364
 for Associate in Arts degree, 54
 required for admission, 21
 Matriculation, credit, 36
 examinations, 22
 Mechanical engineering, 14, 89, 94, 293
 Medical College Admission Test, 61, 122
 Medical examination required, 29
 Medical science, courses in (*see* Anatomy,
 Biochemistry, Physiology)
 major, 61, 63
 Medico-military science and Tactics, 376
 Medical technology, 17, 123
 Medicine, School of, 15, 44, 122
 admission test, 61, 122
 minimum scholarship requirements, 39
 premedical curriculum, 62
 tuition fee, 44
 Metallurgy, 14, 89, 96, 299
 Meteorology, 325
 Microbiology, 166, 208
 Military science and tactics, 33, 174, 376
 required for Associate in Arts degree, 53
 Mineral technology, 12, 298
 Mineralogy, 332
 Minimum scholarship requirements, 37
 Mining, curricula in, 14, 89, 96
 courses in, 303
 Modeling, 193
 Mongolian, 404
 Morrison Library, 19
 Municipal engineering, 92
 Museum, of Paleontology, 11, 411
 of Anthropology, 191
 of Vertebrate Zoology, 11, 496
 Music, 12, 174, 384
- Natural science requirement, 53
 Naval architecture, 95, 294
 Naval science, 34, 391
 Navigation, celestial, 202
 Near Eastern languages, 12, 393
 Nematology, 153
 Nonmajor curriculum, 51, 56
 Nonresident students, tuition fee for, 45
 Norse, 466
 Norwegian, 465
 Numbering of courses, 139
 Nursery school administration, 348
 Nursing, curricula in, 15, 126
 courses in, 395
 minimum scholarship requirements, 38
 nursing education, 127, 128
 public health, 127, 128
 School of, 15, 126
 Nutrition and dietetics, 76, 346, 350
- Observatory, 13, 203
 Oceanography, 13, 399
 Officers, administrative, 7-10
 Optics, 400, 423, 492
- Optometry, School of, 15, 38, 129
 courses in, 399
 Organization of instruction, 11-17
 Organization of the University, 11
 Oriental art, 197
 Oriental languages, 12, 65, 66, 402
 Orthoptics, 124
- Paleontology, 12, 407
 museum of, 11, 411
 Parasitology, 74, 79, 152, 170
 Passing and non-passing grades, 37
 Personnel administration, courses in, 219,
 439
 Personnel officer, 10
 Petroleum engineering, 14, 89, 97, 304
 Pharmacology, 210
 Pharmacy, College of, 12, 16, 38, 44, 99
 Philology, 463 (and *see* under the various
 languages)
 Philosophy, 12, 411
 Phonetics, 237, 464, 486
 Photogrammetry, 277, 320
 Physical education, 12, 81, 63, 174, 414
 Physical examination required, 30
 Physical therapy, 124
 Physics
 courses in, 175, 420
 engineering, 93, 421
 high school preparation recommended, 21
 library, 19
 Physiological optics, 401
 Physiology, 12, 175, 428
 Placement, Bureau of, 49
 Planning, city and regional, 173, 233
 Plant biochemistry, 159
 Plant nutrition, 159, 175
 Plant pathology, 160, 175, 180
 Plant physiology, 180
 Plant science curriculum, 76, 81
 Playwriting, 248
 Points, grade, 37
 Polish, 467
 Political science, 12, 176, 430
 Pomology, 161, 176
 Portuguese, 484
 Poultry husbandry, 161, 176
 Prerdental curricula, 85
 Preforestry, 75, 80, 114
 Prelegal preparation, 118
 Premedical curriculum, 62
 Preparation for University curricula, 22
 Preveterinary science, 78, 81
 Prizes, 50
 Probation, 38
 Process engineering, 90, 95, 98
 Professional curricula, 14, 16, 52, 57
 courses, 139, 140
 Psychology, 12, 177, 898, 443
 Public administration, Bureau of, 11, 19,
 443
 courses in, 438
 Public health
 biostatistics, 134

- Public Health—(*Continued*)
 courses in, 177, 398, 454
 curricula in, 15, 131
 education, 133
 library, 19
 minimum scholarship requirements, 38
 nursing, 16, 126
 preadministration, 132
 sanitation, 132
 School of, 15, 126, 131
- Radiation laboratory, 11
 Radio communication, 287
 Readmission after dismissal, 37
 Real estate, 221
 Recreation, group major in, 64
 courses in, 418
 Reexamination, 39
 Refrigeration, 293, 294
 Refunds of fees, 45
 Regents, 6
 Regional group majors, 64
 China, 65
 France and French colonies, 65
 Germany and Central Europe, 65
 Hispanic America, 65
 Japan, 66
 Russia and Eastern Europe, 66
 Southeast Asia, 66
 Registration, routine of, 30
 late, 27
 Regulations concerning students in
 academic departments, 30-50
 Religion, 66
 Removal of deficiencies, 40
 Renaissance, group major in, 67
 Repetition of course for higher grade, 40
 Reports of student grades, 37
 Requirements, for admission, 20-29
 for degrees (*see* under the various
 colleges)
 Reserve Officers Training Corps, 33
 Residence, rules governing, 46
 requirements for degree, 35, 56
 Resident courses, 140
 Romance philology, 463
 Romanic languages (*see* under French,
 Italian, Spanish)
 Russian, 468, 469
- San Francisco, departments at, 12
 Sanitary engineering, 92, 280
 Sanskrit, 12, 239
 Santa Barbara College, 13
 Scandinavian languages and literature, 12
 464
 Scholarship, grades of, 37
 minimum requirements of, 37
 requirements for admission, 20
 Scholarships and fellowships, 50
 Schools, 11, 14
 Sciences (*see* under the various
 departments)
 for admission, 21
 for Associate in Arts degree, 53
- Scripps Institution of Oceanography, 13
 Sculpture, 67, 193
 Seismology, 332
 Self-government of students, 42
 Self-support of students, 48
 Semantics, 487
 Semitic languages (*see* Near Eastern
 languages)
 Senate, Academic, 13
 Serbo-Croatian, 467
 Siamese, 405
 Site and climate of Berkeley, 43
 Slavic languages, 12, 466
 Social institutions, 12, 475
 Social sciences, for Associate in Arts
 degree, 54
 Social studies, 111
 Social welfare, 16, 67, 185, 399, 470
 Sociology, 12, 475
 Soil science, 77, 81, 162, 177, 180
 Sororities, 48
 Spanish, 12, 177, 480
 Special education, courses in, 269
 Special examinations, 40
 Special students, 26
 Special study courses, 139
 Speech, 12, 54, 177, 484
 Staff, administrative, 7-10
 Stagecrafts, 248
 Statistics, courses in economics, 251, 253,
 255
 for biologists, 173
 in education, 260, 263
 in mathematics, 372
 in psychology, 447
 in public health, 459
 in sociology and social institutions, 476
 Stern Hall, 47
 Student-body card, 43
 Student health service, 31
 Student self-government, 42
 Study-list regulations, 35, 52, 82
 Subject A, 32, 177, 488
 Sumerian, 394
 Summer sessions, 18, 23
 courses for the Associate in Arts degree,
 55
 Supervised teaching, 110
 courses in, 266
 Survey of curricula, 13-17
 Surveying, 274
 Swedish, 465
 Syriac, 394
- Teacher placement, 49
 Teacher-training, curricula, 109
 courses, 139
 Technicians, 17, 123-126, 192, 193
 Textiles, 245, 348
 Tibetan, 404
 Transcript of record, 41
 Transportation and traffic engineering, 92,
 98, 306
 Truck crops, 164, 177
 Tuition, 45

- Undergraduate curricula, 13
Units of work and credit, 36
University Extension, 11, 18, 23, 55, 56,
140
University of California, Davis, 13
University of California at Los Angeles, 12,
17
University Theater, 247
Unsatisfactory scholarship, 37
Upper division, 25
 in the College of Letters and Science, 52,
 55
 courses defined, 139
Vaccination required, 28, 30
Vegetable production, 177
Veterans affairs, 10, 49
Veterinary medicine, 13, 16, 178
Veterinary science, 178
Viruses, biochemistry of, 209
Visual instruction, 18
Viticulture, 179
Welfare, social, 16, 67, 135, 399, 470
Wildlife conservation, 68, 492, 495
Women's Athletic Association, 32
X-ray technicians, 17, 125
Year courses, 30, 139
 required for Associate in Arts degree, 54
Zoölogy, 12, 179, 489
Zymology, 155

**Administrative Bulletins of the University of California
1951-1952**

The administrative bulletins of the University of California present information concerning the colleges, schools, and departments of the University. For copies of general bulletins and of bulletins or other information concerning instruction at Berkeley and Davis, address the Registrar of the University of California, Berkeley 4; for bulletins concerning instruction at Los Angeles, address the Registrar of the University of California, Los Angeles 24; for bulletins concerning instruction at Santa Barbara, address the Registrar of Santa Barbara College, Santa Barbara; bulletins of the schools and colleges in San Francisco may be had by addressing the deans in charge.