

UNIVERSITY

OF

CALIFORNIA

—

GENERAL

CATALOGUE

1953 - 1954

REGISTRAR'S OFFICE

CORRECTED COPY

UNIVERSITY OF CALIFORNIA
SUPPLEMENTARY ANNOUNCEMENTS

to the Announcement of Courses, Departments at Berkeley

New Courses; Changes in Courses; New Appointments;
Changes in Appointments

September, 1953



NOTE.—Changes in the time schedule are not included in this circular. Consult the SCHEDULE AND DIRECTORY and departmental bulletin boards.

The number in parentheses represents the unit value of the course.

AGRICULTURAL ECONOMICS

New Appointment:

Arthur Shultis, M.S., *Lecturer in Agricultural Economics.*

AIR SCIENCE AND TACTICS

New Appointment:

Dorwin C. Wilson, Major, U.S.A.F.; *Associate Professor of Air Science and Tactics.*

ANATOMY

New Appointment:

Robert D. Weyand, M.D., *Associate in Anatomy.*

103. Mr. Weyand to assist.

ANTHROPOLOGY

New Appointment:

George M. Foster, Jr., Ph.D., *Visiting Professor of Anthropology.*

New Courses:

161. Europe and the Mediterranean. (3) II. Mr. Foster

Prerequisite: course 1, 2A-2B, or junior standing.

The folk peoples and typical examples of higher cultures will be considered in modern and historical perspective from an anthropological point of view.

191. Hispanic Culture in Spain and Spanish America. (3) I. Mr. Foster

Prerequisite: course 1, 2A-2B, or junior standing.

Comparative analysis of Spanish ethnography in Spain and Spanish America, in relationship to the development of contemporary Hispanic American culture.

216. Problems in Archaeological Method. (2) II. Mr. Heizer

Prerequisite: Anthropology 206.

Techniques of analysis of archaeological data; critical review of excavation data and analytical results; continental perspective of Far Western prehistoric cultures.

261A-261B. Problems in Acculturation. (2-2) Yr.

Mr. Foster

Prerequisite: Course 206, or consent of instructor.

Analysis of the forms and variety of culture changes originating in the contact of different ethnic groups.

118A. Not to be given.

ARCHITECTURE

New Appointment:

Charles Eames, *Visiting Professor of Architecture.*

Students should consult their faculty advisers concerning any changes in the degree requirements in Architecture.

Following is the program of study for students in Architecture entering as freshmen in the fall semester, 1953:

<i>Freshman Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Subject A (See page 34 of the CIRCULAR OF INFORMATION) ..	..	..
American History and American Institutions (see page 35 of the CIRCULAR OF INFORMATION) ..	..	..
Military Science	2	2
Mathematics 3A-3B	3	3
Physics 2A .....	..	3
Physics 3A .....	..	1
Elective	3	3
Architecture 1N-2N	3	3
Architecture 5N-6N	2	2
Architecture 14A	2	..
Art 2A	2	..
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	17	17

New Courses:

1N. Design. (3) I and II.

Mr. Eames

Lecture, freehand drawing and drafting practice. Study of architectural forms and composition.

2N. Design. (3) II.

Prerequisite: course 1N.

Continuation of course 1N with emphasis on color, texture, and three dimensional concept.

5N. Introduction to the Professions of Architecture, City and Regional Planning and Landscape Architecture. (2) I.

Mr. Wurster, Mr. Kent, Mr. Vaughan

Lectures in charge of each Department Chairman introductory to each professional field.

121. Architectural History. (3) I.

Mr. Ackerman

Prerequisite: course 4. For architectural students only.

Survey of Ancient and Medieval periods. Students may not receive credit for both course 5A-5B and course 121.

This course is included in the Letters and Science List of Courses.

122. Architectural History. (3) II. Mr. Ackerman
Prerequisite: course 4. For architectural students only.
Survey of Renaissance and Modern periods. Students may not receive credit for both course 5C-5D and course 122.
This course is included in the Letters and Science List of Courses.

Change in Course:

- 2P. Architectural Drawing: Descriptive Geometry. (3) I. Mr. Cardwell
(Formerly numbered 2.)
Prerequisite: course 1 and solid geometry.
Students may not receive credit for both course 2P and 6N.
- 6N. Descriptive Geometry. (2) I and II. Mr. Cardwell
(Formerly numbered 2.)
Prerequisite: solid geometry.
Lecture, drafting, and problem solution.
Students may not receive credit for both course 6N and 2P.

Change in Course Description:

- 5A-5B. Students may not receive credit for both course 5A-5B and course 121.
5C-5D. Students may not receive credit for both course 5C-5D and 122.
1. Not to be given.

BOTANY

Absent on Leave, spring semester, 1953-1954:

Lincoln Constance, Ph.D., *Professor of Botany and Curator of Seed Plant Collections.*

BUSINESS ADMINISTRATION

Absent on Leave, fall semester, 1953-1954:

Paul F. Wendt, Ph.D., *Associate Professor of Finance.*

Change in Status:

David A. Revzan, Ph.D., *Professor of Business Administration.*

New Courses:

- 121C. Advanced Accounting. (3) II. Mr. Moonitz
(Formerly numbered 126.)
Prerequisite: courses 121A-121B, 122.
Continuation of 121A-121B; consolidated statements, preparation of funds statements, index numbers in accounting, special problems in analysis of financial statements. Not open to students who have taken course 126 or 132.
132. Interpretation of Financial Statements. (3) II. Mr. Crum
Prerequisite: course 1A-1B, 131, and consent of instructor.
Methods of analyzing and interpreting financial statements, primarily in terms of their use in banking, corporation finance, and investment management. Should not be elected by students specializing in accounting. Not open to students who have taken 121C or 126.
- 150, Sec. 2; 162B, and 174. Not to be given.

CHEMISTRY AND CHEMICAL ENGINEERING

Absent on Leave, 1953-1954:

Theodore Vermeulen, Ph.D., *Professor of Chemical Engineering.*

Absent on Leave, spring semester, 1953-1954:

William D. Gwinn, Ph.D., *Associate Professor of Chemistry.*

Absent on leave, fall semester, 1953-1954:

George Jura, Ph.D., *Associate Professor of Chemistry.*

CITY AND REGIONAL PLANNING

New Appointment:

Donald L. Foley, Ph.D., *Lecturer in City Planning and Lecturer in Sociology and Social Institutions.*

211. To be given by Mr. Kent and Mr. Foley.

212. To be given by Mr. Kent and Mr. Foley.

299. Mr. Foley added to the staff of instruction.

CRIMINOLOGY

New Appointment:

Peter M. Kristovich, A.B., *Lecturer in Criminology.*

DECORATIVE ART

New Appointment:

Mrs. Yolanda S. Newby, M.A., *Acting Instructor of Decorative Art for the Fall Semester.*

ECONOMICS

Change in Course Prerequisite and Description:

218. Prerequisites for the course are no longer course 118 and a reading knowledge of Russian.

Population and labor force, national income, investment, structure of the economy, financial system, prices, planning. Problems in research and analysis.

EDUCATION

Absent on Leave, spring semester, 1953-1954:

William A. Brownell, Ph.D., LL.D., *Professor of Education (Chairman of the Department).*

Resigned:

Arthur H. Brayfield, Ph.D., *Assistant Professor of Education.*

ENGINEERING

Civil Engineering and Irrigation

New Appointment:

P. Harold McGauhey, M.S., *Lecturer in Civil Engineering.*

Change in Status:

David K. Todd, M.S., *Acting Assistant Professor of Civil Engineering.*

Edward Q. Moulton, M.S., *Lecturer in Civil Engineering.*

Resignation:

Bernard A. Vallerga, M.S., *Assistant Professor of Civil Engineering.*

108G, Sec. 1. To be given by Mr. Finn.

108G, Sec. 3. To be given by Mr. Monismith instead of Mr. Vallerga.

113, Sec. 2. To be given by Mr. Baron instead of Mr. Vallerga.

137. To be given by Mr. Baron instead of Mr. Eberhart.

Electrical Engineering

New Appointment:

Eliahu Jury, Ph.D., *Instructor in Electrical Engineering.*

222. To be given by Mr. Jury instead of Mr. Robertson.

Engineering Design

New Appointment:

Harry Brandt, M.S., *Associate in Engineering Design.*

Engineering 22. Mr. Brandt added to the staff of instruction.

Mechanical Engineering

New Appointments:

George J. Maslach, B.S., *Lecturer in Mechanical Engineering.*

Amritlal M. Dhanak, B.S., *Associate in Mechanical Engineering.*

James A. Harder, M.S., *Associate in Mechanical Engineering.*

Sabbatical Leave in Residence, 1953-1954:

Louis E. Davis, M.S., *Associate Professor of Mechanical Engineering.*

103. Mr. Harder added to the staff of instruction.

105A. To be given by Mr. Dhanak.

107. To be given by Mr. Dhanak.

Mineral Technology

Mining

Resigned:

Bernard York, E.M., *Associate Professor of Mining.*

151, 198, 199, 298, 299A and 299B. To be given by Mr. Shaffer instead of Mr. York.

ENGLISH

Change in Course Description:

220A*-220B. The Medieval Mind. (3-3) Yr.

_____, Mr. Jones

*220A. Readings in Medieval Latin.

220B. Dominant Themes in Medieval Life.

Mr. Jones

An introduction to the central language and literature of the Middle Ages.

Attention is called to the course Romance Philology 201, Late Latin Language and Literature. Course 220A is not prerequisite to 220B.

GERMAN

New Appointment:

Henry Lippegau, M.A., *Associate in German.*

1 and 2. Mr. Lippegau to assist.

HISTORY

171A, Sec. 1. To be given Tu Th 9 in 11 W by Mr. May, instead of Tu Th 8.

Examination group number is 13.

205. To be given II.

* Not to be given, 1953-1954.

HOME ECONOMICS

New Appointment:

Phyllis W. Houlding, M.A., *Acting Instructor in Home Economics.*

Resigned:

Mary S. Spencer, *Instructor in Home Economics.*

1B. Not to be given.

11. To be given by Miss Kennedy instead of Mrs. Spencer.

100. To be given by Mrs. Houlding.

162. To be given by Miss McClelland.

LANDSCAPE ARCHITECTURE

New Appointment:

Richard B. Taylor, A.B., *Lecturer in Landscape Architecture.*

101A. To be given by Mr. Taylor instead of Mr. Vaughan.

111A. To be given by Mr. Vaughan and Mr. Taylor.

MATHEMATICS

New Appointment:

Jan Van der Corput, Ph.D., *Visiting Professor of Mathematics.*

112B. To be given by Mr. Epstein instead of Mr. Sciobereti.

240A. To be given by Mr. Protter.

NAVAL SCIENCE

New Appointment:

George Shaw-Corthorn, Lt. Comdr., U.S.N., *Associate Professor of Naval Science.*

NURSING

New Appointment:

June T. Bailey, R.N., Ed.D., *Acting Assistant Professor of Nursing.*

432. To be given by Mrs. Bailey.

PHILOSOPHY

New Appointment:

Richard H. Popkin, Ph.D., *Visiting Assistant Professor of Philosophy.*

PHYSICS

Medical Physics

New Appointment:

Robert A. Wijsman, Ph.D., *Lecturer in Medical Physics.*

4C. To be given Tu Th S 9 instead of Tu Th S 10, in 1 LeConte. Examination group is 13.

POLITICAL SCIENCE

Additional Appointment:

Hermann L. Meyer-Lindenberg, Ph.D., *Lecturer in Political Science for the fall semester.*

New Course:

155B. Inter-American Law. (2) I.

Mr. Meyer-Lindenberg

Course 155A is not prerequisite to 155B.

The basic legal rules in Inter-American relations. The history and results of the Inter-American Conferences. The Organization of American defense system. Analysis of Inter-American treaties. The pacific settlement of Inter-American conflicts.

155B. To be given by Mr. Meyer-Lindenberg Tu Th 2 in 121 W. Examination group is 5.

PUBLIC HEALTH

New Appointments:

Sarah Mazelis, M.P.H., *Associate in Public Health.*

Morey R. Fields, Ed.D., M.P.H., *Visiting Professor of Health Education.*

Carl Goetsch, M.D., *Lecturer in Public Health.*

234A. To be given by Mr. Fields.

SLAVIC LANGUAGES AND LITERATURES

Change in Title of Instructor:

Michael K. Pawlikowski, LL.M., *Associate in Polish and Russian.*

George C. Guins, LL.M., *Lecturer in Russian and Political Science.*

Ante Kadic, Ph.D., *Lecturer in Serbo-Croatian.*

SOCIAL WELFARE

New Appointments:

Portia Bell Hume, M.D., *Assistant Clinical Professor of Psychiatry and Lecturer in Social Welfare.*

Audrey Schumacher, Ph.D., *Associate Clinical Professor of Psychology and Lecturer in Social Welfare.*

Emanuel Windholz, M.D., *Assistant Clinical Professor of Psychiatry and Lecturer in Social Welfare.*

261. To be given by Mrs. Schumacher.

262. To be given by Mrs. Hume and ———.

SOCIOLOGY AND SOCIAL INSTITUTIONS

New Appointment:

Donald L. Foley, Ph.D., *Lecturer in Sociology and Social Institutions and Lecturer in City and Regional Planning.*

Absent on Leave, 1953-1954:

Reinhard Bendix, Ph.D., *Associate Professor of Sociology and Social Institutions.*

New Course:

226. The Metropolitan Region. (2) I.

Mr. Foley

The role and influence of the large city in ordering the social life and spatial patterns of its surrounding territory. The multi-nucleated urban agglomerate. The urban-rural fringe. Social-economic relations among large city, small city, village and farm.

226. To be given Tu 7:30-9:30 p.m. in 430 W.

ZOOLOGY

New Appointment:

Robert B. Clark, B.S.C., *Acting Assistant Professor of Zoology.*

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SUPPLEMENTARY ANNOUNCEMENTS

to the Announcement of Courses, Departments at Berkeley

New Courses; Changes in Courses; New Appointments;
Changes in Appointments

February, 1954



NOTE.—Changes in the time schedule are not included in this circular. Consult the SCHEDULE AND DIRECTORY and departmental bulletin boards.

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AGRICULTURAL ECONOMICS

New Appointment:

John H. Snyder, Ph.D., *Instructor in Agricultural Economics.*

New Course:

25. Comparative World Agriculture. (3) II. Mr. Ryerson

Survey of world agriculture, stressing the development of principal agricultural regions and the interrelations among physical environment, agricultural growth and population. Tenure, credit, and land reform problems, and the development of backward regions.

Change in Course Description:

208. The economic and social aspects of conservation with particular reference to public policies.

145. To be given by Mr. Snyder instead of Mr. Weeks.

160B. Not to be given.

AIR SCIENCE AND TACTICS

New Appointment:

Winfield F. Tatro, Major, U.S.A.F.; *Associate Professor of Air Science and Tactics.*

1A. Not to be given.

1B. Mr. Mullin in charge instead of Mr. Newsom. No prerequisite.

21A. Not to be given.

21B. Mr. Wilson in charge instead of Mr. Roeser. Prerequisite: courses 1A and 1B, or their equivalent.

131C. Mr. Roeser in charge instead of Mr. Files and Mr. Triner.

141B. Mr. Files in charge instead of Mr. Mullin.

ANATOMY

New Appointment:

Victor M. Kostainsek, M.D., *Lecturer in Anatomy for the Spring Semester.*

102. To be given by Mr. Hawkins and Mr. Kostainsek.

ANTHROPOLOGY

New Course:

119. Problems in Culture and Personality. (3) II. Mr. Mandelbaum
Prerequisite: courses 1, 2A-2B, or junior standing, and consent of instructor.
The interplay of cultural and personality factors in human development; personality in various cultural settings; the "national character" concept and other concepts in the field; techniques for the study of culture-personality relations.
- 118B. Not to be given.
245. Not to be given.

ARCHITECTURE

Change in Course:

- 6N. Descriptive Geometry. (2) I and II. Mr. Cardwell
Equivalent to 2 units of course formerly numbered 2 or 2P.
Prerequisite: solid geometry.
Lecture, drafting, and problem solution.
- 1N. Mr. Eames in charge, Mr. Thiel and Mr. Rauma added to the staff of instruction.
- 2N. To be given by Mr. Eames in charge and Mr. Czaja.
4. Mr. Moïse and Mr. DeMars added to the staff of instruction.
- 6D. To be given by Mr. Perry instead of Mr. Simonds and Mr. Stump.
12. Mr. Lagorio and Mr. Reichek added to the staff of instruction.
18. Not to be given.
- 102C-102D. Not to be given.
- 113B. Not to be given.
- 114A. To be given.
115. Mr. Thiel added to the staff of instruction.

ART

New Course:

140. The Art of Primitive Peoples. (3) II. Mr. Chipp
An analysis of style and an aesthetic evaluation of forms in the art of several primitive cultures, developed according to art-historical principles. Special consideration is given to an integration of the art with the cultural background.
- 3A. Mr. Lockwood added to the staff of instruction.
- 105B. To be given.
107. Not to be given.
- 113B. Not to be given.
173. To be given.
195. To be given by Mr. Wessels.

ASTRONOMY

New Appointment:

Stanislavs Vasilevskis, Ph.D., *Lecturer in Astronomy for the Spring Semester.*

Change in Course:

- 225A-225B. Celestial Mechanics. (3-3) Yr. changed to: 225. Introduction to Celestial Mechanics. (2) I and II. Mr. Vasilevskis

BACTERIOLOGY

201. Mr. Elberg in charge instead of Mr. Krueger.
202. Mr. Douderoff in charge instead of Mr. Stanier.

BIOCHEMISTRY

Plant Biochemistry

225. Not to be given.

BUSINESS ADMINISTRATION

New Appointments:

- John M. Smith, B.S., LL.B., *Associate in Business Law for the Spring Semester.*
Alexander R. Heron, B.S., *Lecturer in Business Administration for the Spring Semester.*
Folke Kristensson, Ph.D., *Visiting Professor of Business Administration for the Spring Semester.*
Thomas N. St. Hill, Ph.B., *Lecturer in Business Administration for the Spring Semester.*
David Solomons, B.Com., *Visiting Associate Professor for the Spring Semester.*
David G. Tyndall, Ph.D., *Lecturer in Business Administration for the Spring Semester.*

- 1A. Mr. Storey added to the staff of instruction.
18. Mr. J. Smith added to the staff of instruction.
122. Mr. Solomons added to the staff of instruction.
132. To be given by Mr. Doyle instead of Mr. Crum.
160. Mr. Kristensson added to the staff of instruction.
162B. To be given.
174. To be given.
176. To be given by Mr. Tyndall.
222. To be given by Mr. Solomons instead of Mr. Doyle.
257. To be given by Mr. Ross and Mr. Heron.
298. To be given by Mr. Schmelzle and Mr. St. Hill.

CHEMISTRY AND CHEMICAL ENGINEERING

New Appointments:

- Andrew Acrivos, Ph.D., *Instructor in Chemical Engineering for the Spring Semester.*
Joseph Miller, Ph.D., *Instructor in Chemistry for the Spring Semester.*

Absent on Leave, Spring Semester, 1954:

- David H. Templeton, Ph.D., *Assistant Professor of Chemistry.*

Resigned:

- John E. Powers, Ph.D., *Associate in Chemical Engineering.*
110A. To be given by Mr. O'Konski instead of Mr. Templeton.

CITY AND REGIONAL PLANNING

New Course:

221. Seminar in City Planning Research. (2) II. Mr. Foley
Prerequisite: completion of at least 12 units of upper division work basic to the subject of the seminar, and graduate standing.

The social research phase of city planning; organization for research within the planning agency; the use of available source materials; the conduct of field surveys.

CRIMINOLOGY

New Appointment:

Albert E. Riedel, A.B., *Lecturer in Criminology for the Spring Semester.*
164. To be given by Mr. Riedel.

DECORATIVE ART

New Appointment:

Florence Welch, A.B., *Acting Instructor for the Spring Semester*

Resigned:

Lynnette G. Stanaitis, A.B., *Acting Instructor in Decorative Art.*
6A. Mrs. Miller and Mrs. Welch added to staff of instruction.

DRAMATIC ART

130C. To be given.

ECONOMICS

Absent on Leave, Spring Semester, 1954:

Emily H. Huntington, Ph.D., *Professor of Economics.*

119. Not to be given.

142. To be given by Mr. Herman instead of Mr. Crum.

185. To be given by Mr. Galenson instead of Miss Huntington.

199. To be given by Mr. Grossman.

210. Not to be given.

241. Not to be given.

293. To be given by Mr. Knight.

EDUCATION

New Appointments:

Barbara A. Kirk, M.A., *Lecturer in Education.*

Marjorie J. Palmquist, Ph.D., *Lecturer in Education for the Spring Semester.*

James A. Saum, Ed.D., *Lecturer in Education for the Spring Semester.*

Change in Status:

Margaret B. Hanson, M.A., *Lecturer in Education and Supervisor of the Teaching of Home Economics and Associate in Home Management for the Spring Semester.*

110. Mr. Tyler added to the staff of instruction.

162. To be given by Miss Palmquist instead of Mr. Brayfield.

199. Mr. Kyte in charge instead of Mr. Brownell.

231. Not to be given.

235. Not to be given.

264. To be given by Mr. Saum instead of Mr. Brayfield.

298. Mr. Kyte in charge instead of Mr. Brownell.

325. To be given by Mrs. Kirk instead of Mr. Brayfield.

ENGINEERING

New Appointment:

Richard M. Fulrath, M.S., *Associate in Engineering for the Spring Semester.*

- 40. To be given by Mr. Hultgren instead of Mr. Dorn.
- 40K. To be given by Mr. Hultgren instead of Mr. Dorn.
- 48. Not to be given.
- 113. Mr. Levens in charge instead of Mr. Wiley.

Civil Engineering

New Appointment:

Jerome M. Raphael, M.S., *Associate Professor of Civil Engineering and Irrigation.*

- 102B. Not to be given.
- 107E. To be given.
- 107F. Mr. Troxell in charge and Mr. Smith instead of Mr. Scordelis.
- 107G. To be given by ——— instead of Mr. Eberhart and Mr. Bresler.
- 108E. To be given by Mr. Raphael and Mr. Polivka.
- 108G. To be given by Mr. Finn and Mr. Monismith.
- 109A. Mr. McGahey added to the staff of instruction.
- 111A. Mr. Moulton added to the staff of instruction.
- 112. Mr. Clough added to the staff of instruction.
- 113. To be given by Mr. H. E. Davis and Mr. Jameyson.
- 126. Not to be given.
- 133. Mr. Baron added to the staff of instruction.
- 135. Mr. Raphael and Mr. Smith added to the staff of instruction.
- 137. To be given by Mr. Eberhart and Mr. Pirtz instead of Mr. Baron.
- 147. To be given by Mr. Tebbens and Mr. Crosby.
- 149. To be given by Mr. McGahey and Mr. D. S. Berry.
- 166. To be given by Mr. Einstein and Mr. Wiegel.
- 198. To be given by Mr. Troxell in charge and Mr. Jameyson instead of Mr. Simpson in charge.
- 199. Mr. Troxell in charge instead of Mr. Simpson.
- 222B. To be given by Mr. Kaufman in charge and Mr. Orlob.
- 230B. To be given by Mr. Popov in charge and Mr. Pister.

Irrigation

- 102A. To be given by Mr. Clendenen instead of Mr. Simpson.
- 103. To be given by Mr. Clendenen instead of Mr. Simpson.
- 104. To be given by Mr. Simpson instead of Mr. Hotes.
- 198. Mr. Simpson in charge instead of Mr. Hotes.
- 199. Mr. Simpson in charge instead of Mr. Hotes.
- 202. Not to be given.
- 299A-299B. Mr. Hotes in charge instead of Mr. Simpson.

Electrical Engineering

New Appointment:

Dwight W. Brede, M.S., *Associate in Electrical Engineering for the Spring Semester.*

- 100A-100B. Mr. Thal-Larsen and Mr. Finch added to the staff of instruction.
 101. Mr. Finch added to the staff of instruction.
 104B. Mr. Pritchett in charge instead of Mr. Robertson.
 105. Mr. Robertson in charge instead of Mr. Pritchett.
 110A. Mr. O. J. M. Smith added to the staff of instruction.
 111A. To be given by Mr. Saunders.
 116A. To be given by Mr. Whinnery instead of Mr. Scott.
 127. To be given by Mr. Hinrichs in charge, and Mr. Jury.
 133A. Mr. McFarland in charge instead of Mr. Saunders.
 141. To be given by Mr. Gier instead of Mr. Finch.
 216. To be given by Mr. Held instead of Mr. Angelakos.
 218B. Not to be given.
 226B. Not to be given.
 251B. Not to be given.
 252B. Not to be given.
 400. Not to be given.

Engineering Design

New Appointment:

- Garland W. Brown, M.S., *Assistant Professor of Engineering Design.*
 102C. To be given by Mr. Goldsmith instead of Mr. Meriam.
 172. Mr. Brown added to the staff of instruction.
 280. To be given by Mr. Atkinson instead of Mr. Soroka.

Mechanical Engineering

Returned from Military Leave, Spring Semester, 1954:

- Virgil E. Schrock, M.E., *Instructor in Mechanical Engineering.*
 105B. To be given by Mr. Hutchinson, Mr. Giedt, and Mr. Ipsen.
 109. To be given by Mr. Drake and Mr. Starkman instead of Mr. Ipsen.
 118. To be given by Mr. Giedt instead of Mr. Dunkle.
 143. To be given by Mr. Davis instead of Mr. McCauley.
 151. Mr. H. A. Johnson added to the staff of instruction.
 152. To be given by Mr. Snyder.

Mineral Technology

Mining

- 105B. To be given by Mr. Reed instead of Mr. York.
 113. To be given by Mr. Reed instead of Mr. York.
 201. To be given by Mr. Shaffer instead of Mr. York.

Transportation Engineering

New Appointment:

- Richard M. Zettel, M.A., *Lecturer in Transportation Engineering for the Spring Semester.*

ENGLISH

Absent on Leave, Spring Semester, 1954:

- Gordon McKenzie, Ph.D., *Associate Professor of English.*
 46B. Mr. Shumaker added to the staff of instruction.

100. Mr. Potter added to the staff of instruction.
257B. Not to be given.
298. Mr. Bronson in charge instead of Mr. Schorer.
299. Mr. Bronson in charge instead of Mr. Schorer.

ENTOMOLOGY AND PARASITOLOGY

212. Not to be given.

FOOD TECHNOLOGY

127. Not to be given.
140. To be given by Mr. Joslyn.

FORESTRY

- 203B. To be given by Mr. Stone.

FRENCH

- 101A-101B. Miss Dufrenoy and Miss Bercut added to the staff of instruction.
109A. To be given.

GENETICS

- 103B. Not to be given.

GEOGRAPHY

206. To be given.

GEOLOGICAL SCIENCES

199. Mr. Curtis in charge instead of Mr. Gilbert.

GERMAN

1. Mr. Reed in charge instead of Mr. Mileck.
2. Mr. Reed in charge instead of Mr. Mileck.
4M. To be given by Mr. Reed.

HISTORY

Absent on Leave, Spring Semester, 1954:

- Delmer M. Brown, Ph.D., *Associate Professor of History.*
272B. Not to be given.

HOME ECONOMICS

New Appointments:

Margaret B. Hanson, M.A., *Associate in Home Management for the Spring Semester and Lecturer in Education and Supervisor of the Teaching of Home Economics.*

Ruth L. Huenemann, D.Sc., *Lecturer in Home Economics and Lecturer in Public Health Nutrition.*

140. To be given by Mrs. Hanson instead of Mrs. Spencer.
140L. To be given by Mrs. Hanson instead of Mrs. Spencer.
232. To be given.
435. Not to be given.

ITALIAN

3. To be given by Mr. Scaglione.

JOURNALISM

New Appointment:

Charles M. Hulten, M.A., *Visiting Professor of Journalism.*

New Course:

196. Theories and Problems in the Conduct of International Information Programs. (3) II. Mr. Hulten

Prerequisite: Senior or graduate standing and consent of instructor.

A study of governmental efforts at international persuasion; problems of message content, and propaganda directed at the peoples of the world by various countries.

120B. Mr. Seidl added to the staff of instruction.

150. To be given by Mr. Hulten instead of Mr. Rosenberg.

184. To be given by Mr. Griffin.

LANDSCAPE ARCHITECTURE

New Appointment:

Douglas G. Baylis, B.S., *Associate in Landscape Architecture.*

114B. To be given by Mr. Taylor.

116. To be given by Mr. Violich and Mr. DeMars.

LAW

New Course:

271. Professional Conduct and Procedure. No credit. II.

Ten evening lectures, under the direction of the instructor, by leading members of the bar and bench.

LIBRARIANSHIP

205. To be given by Mr. Merritt.

225, 251. To be given.

233, 238. Not to be given.

LINGUISTICS

Change in Course:

230. Seminar in Descriptive Linguistics. (2) I and II.

250. Seminar in Historical Linguistics. (2) I and II.

207, 270. To be given.

MATHEMATICS

New Appointment:

Howard G. Tucker, M.A., *Associate in Mathematics.*

New Courses:

114. Introduction to Theory of Potential. (3) II. Mr. Evans

Prerequisite: 110A-110B or equivalent.

Newtonian and vector potential, differential operators, problems related to Maxwell's equations.

290i. Applications of differential equations. (2-6) II. Mr. Chambré

C. Mr. Kleinecke in charge.

G. To be given by ———.

1. Mr. Meyer in charge.

2. Mr. Epstein in charge.

3A. Mr. Henkin in charge.

- 3H. Mr. Lakness in charge.
 4A. Mr. Wijsman in charge.
 4G. To be given by Mr. Roth instead of Mr. Henkin.
 4H. To be given by Mr. Protter instead of Mr. Meyer.
 8. To be given by Mr. Kleinecke.
 16B. Mr. Lakness in charge.
 109B. To be given by Mrs. Davis instead of Mr. Mates.
 110B. Mr. Roth and Mr. Lakness added to staff of instruction.
 110. To be given by Mr. Roth and ———.
 111A–111B. Mr. Epstein added to the staff of instruction.
 112A. To be given by Mr. Epstein.
 112B. To be given by Mr. Sciobereti.
 118. Not to be given.
 119A–119B. Mr. Wijsman added to the staff of instruction.
 221B. Not to be given.
 270. To be given by Mr. Pinney.
 290. Mr. Lehmer in charge instead of Mr. Evans.
 295. Mr. Lehmer in charge instead of Mr. Evans.

Statistics

12. Mr. Tucker added to the staff of instruction.
 113. To be given by Mr. Hodges instead of Mr. Jeeves.
 120B. To be given by Mr. Lehmann and Mr. Jeeves.
 120D. Mr. Lehmann and Mr. Jeeves in charge.
 132. To be given by Miss Fix instead of Mr. Hodges.
 144. Not to be given.
 290P. Not to be given.
 290Q. Not to be given.

MILITARY SCIENCE AND TACTICS

Change in Status:

John E. Steinke, Captain, Signal Corps; *Assistant Professor of Military Science and Tactics.*

- 27B. To be given by Mr. Pape instead of Mr. Roth.
 28B. To be given by Mr. Shultz instead of Mr. Hayward.
 137B. To be given by Mr. Roth instead of Mr. Pape.
 138B. To be given by Mr. Hayward instead of Mr. Shultz.
 147B. To be given by Mr. Pape instead of Mr. Roth.
 148B. To be given by Mr. Shultz instead of Mr. Hayward.

NAVAL SCIENCE

- 102B. To be given by Mr. Shaw-Corthorn.

NEAR EASTERN LANGUAGES

- 141B. Not to be given.
 152B. Not to be given.
 161B. Not to be given.

- 199. Not to be given.
- 224B. Not to be given.
- 227B. Not to be given.
- 232B. Not to be given.
- 290B. Not to be given.

NURSING

- 201. To be given by Miss MacOwan instead of Miss Tracy.
- 203. To be given by Mrs. Ingmire instead of Miss Castile.
- 206. To be given.
- 207. To be given by Mrs. Ingmire instead of Miss Allen.
- 434. To be given by Mrs. Bailey instead of Miss McCormack.

ORIENTAL LANGUAGES

Absent on Leave, Spring Semester, 1954:

Donald H. Shively, Ph.D., *Assistant Professor of Oriental Languages.*

Change in Course:

- 188. May be repeated without duplication of credit.
- 14G. Not to be given.
- †103. To be given.
- 129B. Not to be given.
- 152. Not to be given.
- 188. To be given.
- 213B. Not to be given.

PHILOSOPHY

New Appointment:

Raymond Jaffe, Ph.D., *Lecturer in Philosophy for the Spring Semester.*

Deceased, November 25, 1953:

Jan Kalicki, Ph.D., *Assistant Professor of Philosophy.*

New Course:

- 220. Seminar in Pragmatism. (2) II. Mr. Jaffe
Study in the philosophy of pragmatism.
- 6A. Mr. Tussman and Mr. Popkin added to the staff of instruction.
- 6B. Mr. Jaffe added to the staff of instruction.
- 12B. To be given by Mr. Mates.
- 108. To be given by Mr. Jaffe.
- 125. Not to be given.
- 139. To be given by Mr. Popkin.
- 140. Not to be given.
- 141B. Not to be given.
- 210B. To be given by Mr. Popkin.
- 213B. Not to be given.
- 225. To be given.

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

PHYSICAL EDUCATION

Deceased, January 2, 1954:

Frederick W. Cozens, Ph.D., *Professor of Physical Education and Director of Physical Education (Chairman of the Department)*.

- 26. Miss Hodgson in charge.
- 102. Not to be given.
- 135. To be given by Miss Espenschade.
- 199. Mr. Henry in charge.
- 231. Not to be given.
- 260A. To be given by Miss Espenschade.
- 260B. Not to be given.

PHYSICS

New Appointments:

George Gamow, Ph.D., *Visiting Professor of Physics for the Spring Semester.*
Warren M. Garrison, Ph.D., *Lecturer in Medical Physics for the Spring Semester.*

New Courses:

- 132. Elementary Atomic and Nuclear Physics. (3) II. Mr. Loeb
Prerequisite: Course 2A-2B or equivalent, elementary calculus, and upper division standing.
Elements of atomic and nuclear structure, and electromagnetic radiation. Designed primarily for upper division and graduate students in the life sciences. Not a substitute for courses 121 and 124, required in Biophysics and Medical Physics.
- 233. Relativity and Cosmology. (3) II. Mr. Gamow
Lorentz transformations, and relativistic mechanics; four-dimensional formulation of mechanics and electrodynamics; geometry of curved spaces; gravitational field; static cosmological solutions; expanding universe and relativistic cosmogony.
- 290r. Energy Sources and Evolution of Stars. (2) II. Mr. Gamow
- 2A-2B. Mr. Goldhaber added to the staff of instruction.
- 4A. Mr. Judd added to the staff of instruction.
- 4C. Mr. Moyer added to the staff of instruction.
- 41A. Mr. Judd added to the staff of instruction.
- 41B. Mr. Moyer added to the staff of instruction.
- 41D. Mr. Moyer added to the staff of instruction.
- 112. To be given by Mr. Kunkel instead of Mr. Loeb.
- 210A. To be given by —— instead of Mr. Richman.
- 290h. Not to be given.
- 290l. To be given by Mr. Garrison.
- 290n. To be given by Mr. Wijsman.

PLANT NUTRITION

New Appointment:

Albert Ulrich, Ph.D., *Lecturer in Plant Nutrition.*

PLANT PATHOLOGY

121. To be given by Mr. Ark.

POLITICAL SCIENCE

New Appointments:

Max W. Thornburg, Ph.D., *Regents Professor of Political Science for the Spring Semester.*

Kenneth Lindsay, M.A., *Lecturer in Political Science for the Spring Semester.*

Resigned:

Richard P. Graves, M.A., *Lecturer in Political Science.*

New Course:

234. International Relations: The Atlantic Region and Western Europe. (2) II.
Mr. Lindsay

Problems in the fields of government and politics with reference to geographical, economic and other implications.

233B. To be given by Mr. Oliver and Mr. Scott.

261B. To be given by Mr. May instead of Mr. Graves.

PSYCHOLOGY

148B. Not to be given.

†235E, 300. To be given.

PUBLIC HEALTH

New Appointments:

John E. Dunn, Jr., M.D., *Lecturer in Public Health for the Spring Semester.*

Ann W. Haynes, M.P.H., *Lecturer in Public Health for the Spring Semester.*

Absent on Leave, 1953-1954:

Vera S. Fry, R.S., A.M., Ed.D., *Professor of Nursing Administration.*

Change in Status:

Ruth L. Huenemann, D.Sc., *Lecturer in Public Health Nutrition and Lecturer in Home Economics.*

113A. Not to be given.

113B. To be given by Mr. Sampson and Mr. Crosby.

133. Not to be given.

134. To be given by Mr. Griffiths and Mrs. Haynes.

160A. Mr. Zippin in charge instead of Mr. Yerushalmy.

160B. Mr. Chiang in charge instead of Mr. Yerushalmy.

161B. To be given by Mr. Yerushalmy.

189. To be given by Miss Huenemann instead of Miss Walsh.

198. To be given by Mr. Bissell and Mr. Sampson.

227. Mr. Griffiths added to the staff of instruction.

231. To be given by Mr. Griffiths.

234B. To be given by Mrs. Haynes instead of Mr. Fields.

289B. To be given by Miss Huenemann.

298. To be given by Mr. Taylor and Mr. Griffiths.

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

SCANDINAVIAN

100B. To be given.

111. Not to be given.

SLAVIC LANGUAGES AND LITERATURES

Change in Unit Value of Course:

133F. Chekhov. (2) II.

182. Not to be given.

SOCIAL WELFARE

Absent on Leave, Spring Semester, 1954:

Maurine McKeany, Ph.D., *Associate Professor of Social Welfare and Supervisor of Field Work.*

205B. Mrs. Hume added to the staff of instruction.

254. To be given by Miss Cooper and Miss McGann.

258B. Mrs. Wertheimer added to the staff of instruction.

266. To be given by Mrs. Maenchen and Mr. Windholz.

293. Not to be given.

295. Not to be given.

298. Mrs. Studt added to the staff of instruction.

401. Mrs. Schubert in charge instead of Miss McKeany.

SOCIOLOGY AND SOCIAL INSTITUTIONS

New Course:

162. Urban Ecology. (3) II.

Mr. Foley

An examination of the ecological and demographic structure of cities. The ecological implications of city planning and housing activity. Mainly concerned with the United States, but some non-American comparative material also introduced.

141B. To be given. Mr. Grana instead of Mr. Woodhouse.

SOILS

114. To be given by Mr. McLaren instead of Mr. Jenny.

SPANISH AND PORTUGUESE

25. To be given by Mr. Malkiel.

SPEECH

Change in Course:

10. Logic of Argument (3) I and II changed to 10A-10B:

10A. The Logic and Semantics of Argument. (3) II.

An introduction to the theory of argument with emphasis on the problems of meaning, inference, and evidence.

10B. The Logic and Semantics of Argument. (3) II.

Application of the principles developed in course 10A to the construction and criticism of arguments, especially those concerned with the rational discussion of social issues.

111A. Miss Blackburn added to the staff of instruction.

ZOOLOGY

New Appointment:

Gilbert Greenwald, M.A., *Associate in Zoölogy for the Spring Semester.*

1A. To be given by Mr. Alfert and Mr. Cannan.

1B. Mr. Landry added to the staff of instruction in place of Mr. Novales.

106. To be given by Mr. Koford and Mr. Greenwald.

109. To be given by Mr. Clark and Mr. Hand.

137. Not to be given.

142B. To be given by Mr. Clark.

**OFFICE OF THE REGISTRAR
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Office of the Registrar
University of California
Davis, California

UNIVERSITY OF CALIFORNIA

Bulletin

General Catalogue

PART I—CIRCULAR OF INFORMATION

PART II—ANNOUNCEMENT OF COURSES

DEPARTMENTS AT BERKELEY

Fall and Spring Semesters

1953–1954

SEPTEMBER 10, 1953

BULLETIN

PUBLISHED AT BERKELEY, CALIFORNIA

Volume XLVIII • September 10, 1953 • Number 10

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). Thirty-four issues a year, three times a month, October and January through May, and four times a month, June through September.



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 10, 1953.

General Catalogue

Consisting of

PART I—CIRCULAR OF INFORMATION

(published as a separate publication on June 20, 1953)

PART II—ANNOUNCEMENT OF COURSES

(published as a separate publication on September 1, 1953)

Fall and Spring Semesters

1953-1954

SEPTEMBER 10, 1953

UNIVERSITY OF CALIFORNIA
BERKELEY

PART I

Circular of Information

UNIVERSITY OF CALIFORNIA

**Circular
of Information**

With Reference Primarily to the
UNDERGRADUATE DIVISION
AT BERKELEY

FALL AND SPRING SEMESTERS

1953-1954

JUNE 20, 1953

BERKELEY · CALIFORNIA

CALENDAR*

Referring Primarily to the Departments of the University at Berkeley

FALL SEMESTER, 1953-1954

July 15, Wednesday	Last day for filing credentials and applications for admission to graduate standing.	
Aug. 13, Thursday	Applications for readmission to the fall semester to be filed with the Registrar by former students, graduate and undergraduate.	
Aug. 15, Saturday	Final date for applications for admission to the fall semester and credentials to be filed with the Director of Admissions. Credentials received as late as this may not be evaluated in time for the enrollment of the student during the regular registration period.	
Sept. 7, Monday	Labor Day—an academic and administrative holiday.	
Sept. 14, Monday	Fall semester begins.	
Sept. 14, Monday	Subject A Examination, 2 to 5 p.m.	
Sept. 15, Tuesday	Mathematics 3 and 3A Qualifying Examination, 4:15 to 5:45 p.m.	
Sept. 15, Tuesday Sept. 16, Wednesday Sept. 17, Thursday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the fall semester.	
Sept. 17, Thursday		Chemistry 1A Aptitude Test, 4 to 5 p.m.
Sept. 21, Monday		Instruction begins.
Oct. 1, Thursday	All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degree in January, 1954, file announcement of candidacy before 5 p.m., at the office of the Registrar, Administration Building.	
Oct. 2, Friday	Last day for filing applications in candidacy for all master's degrees to be conferred in January, 1954; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.	
Oct. 9, Friday	Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1954; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.	
Oct. 26, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in January, 1954; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.	
Nov. 6, Friday	Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1954.	
Nov. 26, Thursday	Thanksgiving Day—an academic and administrative holiday.	
Dec. 15, Tuesday	Last day for filing credentials and applications for admission to graduate standing.	
Dec. 18, Friday	Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in January, 1954.	

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

Dec. 21, Monday	}	Christmas Recess—an academic holiday.
Jan. 2, Saturday		
Dec. 24, Thursday	}	Christmas Holiday—academic and administrative.
Dec. 25, Friday		
Dec. 31, Thursday		Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1954-1955.
Dec. 31, Thursday	}	New Year's Holiday—academic and administrative.
Jan. 1, Friday		
Jan. 4, Monday		Instruction resumes.
Jan. 18, Monday	}	Final examinations in the departments at Berkeley.
Jan. 28, Thursday		
Jan. 28, Thursday		Fall semester ends.

SPRING SEMESTER, 1954

Jan. 7, Thursday		Applications for readmission to the spring semester to be filed with the Registrar by former students, graduate and undergraduate.
Jan. 15, Friday		Applications for admission to the spring semester and credentials to be filed with the Director of Admissions.
Feb. 8, Monday		Spring semester begins.
Feb. 9, Tuesday	}	Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the spring semester.
Feb. 10, Wednesday		
Feb. 11, Thursday		
Feb. 15, Monday		Instruction begins.
Feb. 15, Monday		Last day for filing applications for fellowships and graduate scholarships for 1954-1955.
Feb. 22, Monday		Washington's Birthday—an academic and administrative holiday.
Feb. 25, 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, 1954, file announcement of candidacy before 5 p.m., at the office of the Registrar, Administration Building.
Feb. 26, Friday		Last day for filing applications in candidacy for all master's degrees to be conferred in June, 1954; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 1, Monday		Last day for entering students to file applications for undergraduate scholarships for 1954-1955.
Mar. 5, Friday		Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 8, Monday		Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula, to be received in June, 1954; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Mar. 26, Friday		Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1954.
Apr. 26, Monday	}	Spring recess—an academic holiday.
May 1, Saturday		
May 17, Monday		Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in June, 1954.
May 31, Monday		Memorial Day—an academic and administrative holiday.
June 7, Monday	}	Final examinations in the departments at Berkeley.
June 17, Thursday		
June 17, Thursday		Spring semester ends.

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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

JAMES W. SILLIMAN
Speaker of the Assembly
246 Hawthorne st, Salinas

ROY E. SIMPSON, M.A., Litt.D.
State Superintendent of Public In-
struction
531 Library and Courts bldg,
Sacramento 14

ARTHUR J. MCFADDEN, B.S., LL.B.
President of the State Board of Agri-
culture
902 River lane, Santa Ana

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President of the Mechanics' Institute
804 Mechanics' Institute bldg,
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President of the Alumni Association of
the University of California
650 S Spring st, Los Angeles 14

ROBERT GORDON SPROUL, B.S., LL.D.,
Litt.D.
President of the University
250 Administration bldg, Berkeley 4
203 Administration bldg, Los Angeles 24

APPOINTED REGENTS

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

EDWARD A. DIKSON, B.L. (1958)
425 S Windsor blvd, Los Angeles 5

JOHN FRANCIS NEYLAN, LL.D. (1960)
1 Montgomery st, San Francisco 4

FRED MOYER JORDAN, A.B. (1954)
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BRODIE E. AHLPORT, A.B. (1956)
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EDWARD H. HELLER, A.B. (1958)
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VICTOR R. HANSEN, LL.B. (1962)
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EARL J. FENSTON, A.B. (1964)
504 Helm bldg, Fresno 1

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100 Bush st, San Francisco 4

GUS OLSON, B.S. (1960)
Clarksburg

GERALD H. HAGAR, A.B., J.D. (1964)
Central Bank bldg, Oakland 12

HOWARD C. NAFFZIGER, B.S., M.S., M.D.
(1968)
University of California Medical Center,
San Francisco 22

EDWARD W. CARTER, A.B. (1968)
401 S Broadway, Los Angeles 13

OFFICERS OF THE REGENTS

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Governor of California
President
Sacramento 14

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Secretary and Treasurer
240 Administration bldg, Berkeley 4

James H. Corley, B.S., Vice-President—
Business Affairs
222 Administration bldg, Berkeley 4

Olof Lundberg, C.P.A.
Controller
401 Administration bldg, Berkeley 4

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910 Crocker bldg, San Francisco 4

Ashley H. Conard, B.L., J.D.
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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
204 Administration bldg, Los Angeles 24

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

George E. Stevens
Assistant Controller
404 Administration bldg, Berkeley 4

ADMINISTRATIVE STAFF OF THE UNIVERSITY

President of the University:

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

Chancellor at Berkeley:

Clark Kerr
8385 Dwinelle Hall, Berkeley 4

Chancellor at Los Angeles:

Raymond B. Allen
202 Administration bldg, Los Angeles 24

Vice-President and Provost of the University, Emeritus:

Monroe E. Deutsch

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

Claude B. Hutchison

Vice-President—Agricultural Sciences:

Harry R. Wellman
101 Giannini Hall, Berkeley 4

Vice-President—Business Affairs:

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

Vice-President—University Extension:

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

Provost of Santa Barbara College:

J. Harold Williams
110 Administration bldg, Santa Barbara

Provost of Riverside Campus:

Gordon S. Watkins
107 Administration bldg, Riverside

Provost of Davis Campus:

Stanley B. Freeborn
208 Library-Administration bldg, Davis

Secretary and Treasurer of the Regents:

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

Attorney for the Regents:

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

Controller:

Olof Lundberg
401 Administration bldg, Berkeley 4

Budget Officer:

Ellis J. Goff
289C Administration bldg, Berkeley 4

Assistant to the President:

George A. Pettitt
225 Administration bldg, Berkeley 4

Director of Admissions:

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Charles M. Duke, *Assistant Dean*
Wesley L. Orr, *Assistant Dean*
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212 Library-Administration bldg, Davis

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Franklin P. Rolfe, *Divisional Dean of the Humanities*
Roy M. Dorcus, *Divisional Dean of Life Sciences*
J. A. C. Grant, *Divisional Dean of Social Sciences*
239 Administration bldg, Los Angeles 24

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Director's Residence, Riverside

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250 Business Administration-Economics bldg, Los Angeles 24

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

Deans of the Schools of Social Welfare:
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222 Building T-1, Berkeley 4
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University Extension

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Director of the Scripps Institution of Oceanography:
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Grounds and Buildings, Berkeley 4

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106 Library-Administration bldg, Davis
Raymond Haworth, *Superintendent*
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106 Service bldg, Los Angeles 24

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♡ 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, Davis, La Jolla, Los Angeles, Mount Hamilton, Riverside, San Francisco, and Santa Barbara. A list of the divisions on each campus follows:

I. AT BERKELEY

The Colleges of Letters and Science, Agriculture, 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 Agricultural Extension Service; The Agricultural Experiment Station (in part); The Giannini Foundation of Agricultural Economics; The California Museum of Vertebrate Zoology; The Museum of Paleontology; The Anthropological Museum; The Heller Committee for Research in Social Economics; The Institutes of Child Welfare, of East Asiatic Studies, of Engineering Research, of Experimental Biology, of Geophysics (in part), of Industrial Relations (in part), of Slavic Studies (in part), of Transportation and Traffic Engineering (in part); The Bureau of Business and Economic Research (in part), of International Relations, of Public Administration; The William H. Crocker Radiation Laboratory; The University Art Gallery; The University of California Press; The University Library.

Departments of Instruction in the Colleges at Berkeley

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

* A department of the School of Medicine.

Literatures, Social Welfare, Sociology and Social Institutions, Soils, Spanish and Portuguese, Speech, Vegetable Crops, Zoölogy.

II. AT LOS ANGELES†

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

III. AT SAN FRANCISCO

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

IV. AT DAVIS

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

V. AT RIVERSIDE

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

VI. AT MOUNT HAMILTON

The Lick Astronomical Department (Lick Observatory).

VII. AT LA JOLLA

The Scripps Institution of Oceanography.

VIII. AT SANTA BARBARA

Santa Barbara College.

DIVISION OF AGRICULTURAL SCIENCES

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

ADMINISTRATION

The Regents of the University of California, by authority vested in them by the State constitution, created an academic administrative body called the Academic Senate. The Senate, subject to the approval of the Regents, determines the conditions for admission, for certificates, and for degrees. It authorizes and supervises all courses of instruction in the academic and professional

† A more detailed description of instruction offered at Los Angeles will be found on page 19.

colleges and schools. It recommends to the Regents all candidates for degrees in course. The dean or director of a school, college, or other division of the University is entrusted with the duty of assisting the President in the administration of the University, with special reference to the welfare of the particular school, college, or other division concerned, and of the students therein.*

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.

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

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

San Francisco or at Davis; others may be pursued in full in San Francisco. These curricula lead to the higher degrees, or to degrees and/or certificates, in the respective fields of architecture, bioradiology, business administration, city planning, criminology, dentistry, education, engineering, forestry, journalism, law, librarianship, medicine, pharmacy, public health, nursing, optometry, and social welfare. Full details of the respective curricula will be found in later pages of this bulletin.

The Professional Schools—

The School of 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.).

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

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

Graduate Curricula in Engineering—

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

Special Professional Curricula—

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

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

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

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

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

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

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

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

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

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

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

UNIVERSITY OF CALIFORNIA, LOS ANGELES

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

SUMMER SESSIONS

During the summer the University conducts at Berkeley one or more sessions of six weeks' duration each. In 1953 two such summer sessions of six weeks each were conducted, the first session beginning June 22, and the second beginning August 3. Information concerning the Summer Sessions of 1954 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 campuses of Davis, Los Angeles, San Francisco, and Santa Barbara College.

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 there are a sufficient number of people who wish to study a subject.

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

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

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

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

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

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

THE UNIVERSITY LIBRARY

The Library on the Berkeley campus of the University of California consists of the General Library with its nineteen branch libraries, about fifty departmental and special libraries, and some sixty staff and office collections. These groups, collectively known as the University Library, contain more than 1,800,000 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 nineteen branch libraries are located near the departments which use them most: Architecture Library, Architecture Building; Astronomy Library, Leuschner Observatory; Biology Library, Life Sciences Building; Chemistry Library, Gilman Hall; City and Regional Planning Library, City and Regional Planning Building; Engineering Library, Engineering Building; Forestry

* For information concerning admission to the University through University Extension, see page 25.

Library, Forestry Building; Geological Sciences Library, Bacon Hall; Howison Memorial Library of Philosophy, Dwinelle Hall; Lange Library of Education, Haviland Hall; Library School Library, Main Library Building; Mathematics and Statistical Laboratory Library, Dwinelle Hall; Matthew Memorial Library of Paleontology and Mineral Technology Library, both in the Hearst Mining Building; Music Library, Music Building; Optometry Library, Optometry Building; Physics Library, LeConte Hall; Public Health Library, Life Sciences Building; Virus Laboratory Library, Biochemistry and Virus Laboratory Building.

The Bancroft Library of Californian, western American, and colonial Latin-American history, is on the second floor of the Main Library; the East Asiatic Library, another special collection, is located in Durant Hall.

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

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

Registered students may draw books and periodicals from the University Library, according to the regulations of the various units, by presentation of their registration cards as identification. 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 canceled 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. Every new student must present at the time of medical examination by the University Medical Examiners, a certificate establishing the fact that he has been successfully vaccinated against smallpox within the last seven years. Vaccination should be completed prior to registration. A form for this purpose will be furnished by the University.

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

Admission in Freshman Standing

An applicant who has attended a junior college, four-year college, university, extension classes of college level, or any comparable institution since graduating from high school is subject to regulations governing admission in advanced standing (see page 26). Such college attendance may not be disregarded, whether or not any courses were completed.

ADMISSION ON THE BASIS OF THE HIGH SCHOOL RECORD

The applicant having filed formal application as directed above must have the secondary schools he has attended send to the Admissions Office complete transcripts of record of all studies undertaken in those schools. Such transcripts must show that the applicant has graduated from an accredited* high school. The Admissions Office will then evaluate the high school record, and the applicant will be eligible for admission if he qualifies under any one of the following methods. (There are additional requirements for out-of-state students, and for applicants to the College of Engineering. See page 27.)

1. Complete the high school courses listed under (a) to (f) below. Courses

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

in the (a) to (f) list taken in the ninth grade need show passing marks only; courses in the (a) to (f) list taken in the tenth, eleventh and twelfth grades must be passed with marks that will make an average of at least 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) Laboratory science 1 unit.—This may consist of a year course in one field of science, namely, biology, botany, chemistry, physics, physical science, physiology, or zoölogy. The science selected must be an advanced (third- or fourth-year) laboratory science, and the two semesters must be in the same subject field.
- (e) Foreign language 2 units.—These must be in one language.
- (f) Advanced course chosen from one of the following:
- 1 (or 2) units.—1. Mathematics, a total of 1 unit (second-year algebra $\frac{1}{2}$ or 1 unit; solid geometry, $\frac{1}{2}$ unit; trigonometry, $\frac{1}{2}$ unit);
 2. Foreign language, either 1 additional unit in the same foreign language offered under (e), or 2 units of a different foreign language;
 3. Science, 1 unit of either chemistry or physics in addition to the science offered under (d) above.

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

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

4. Complete not less than 12 high school units with no grade lower than C in work taken in the tenth, eleventh, and twelfth years, exclusive of grades earned in religion, physical education, military science and R.O.T.C. with not less than 6 high school units of grade A or B selected from the following 10 units of academic subjects:

- Third- and fourth-year English
- Third- and fourth-year mathematics
- Third- and fourth-year laboratory science
- Third- and fourth-year foreign language
- Third- and fourth-year history or social science of which one must be United States History.

5. Experimental Plans of Admission:

(a) Agricultural Experimental Plan (applicable September, 1952, through September, 1958). Applicants for admission to the College of Agriculture will be admitted on a program in which two years of science and/or mathematics additional to those used in satisfaction of the (c), (d) and (f) requirements of Plan 1 or two years' credit in high school agriculture or home economics may be substituted for the foreign language requirement. Under this plan, A grades received in agriculture or home economics may not be used to balance C grades in other required subjects. A student admitted under this plan must realize that if, after registration in the College of Agriculture, he wishes to transfer to another college of the University, he must meet the admission requirements of that college.

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

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

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 22, certain preparatory subjects are recommended for each University curriculum which, if included in the high school program, will give the student a more adequate background for his chosen field of study.

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

Attention is directed to the fact that both physics and chemistry, recommended as preparation for many curricula in the University, will, if completed in high school, meet part of the subject requirements for the degree of Associate in Arts in the College of Letters and Science at Berkeley, and thereby give the student greater opportunity in his freshman and sophomore years on the Berkeley campus to choose elective subjects.

Especial care should be exercised by the high school student in selecting a foreign language. The study of a foreign language is not only valuable as part of general education, but a reading knowledge of some foreign language will prove very useful in advanced work in many departments. High school Latin will satisfy either the (b) or (e) requirements for the degree of Associate in Arts in the College of Letters and Science at Berkeley; other languages satisfy only the (b) requirement.

Admission by Examination

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

The University of California does not itself offer entrance examinations, but accepts on all campuses the results of examinations given by the Educational Testing Service for the College Entrance Examination Board. Information about dates and places of examination may be secured from the Educational Testing Service, P. O. Box 9896, Los Feliz Station, Los Angeles 27, California, or P. O. Box 592, Princeton, New Jersey. Definite arrangements to take the tests must be made with the Board at least four weeks prior to the date of the tests. If the applicant has completed all of the subjects in the (a) to (f) list with grades of C or better, but is deficient in the scholarship average, he may clear his admission requirements by standard scores of 500 or above on the Scholastic Aptitude Test and on three achievement tests in subject fields. If the (a) 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) A minimum of 15 units of college transfer courses with a grade-point average of 1.5 or higher, or
- (b) A minimum of 30 units of college transfer courses with a grade-point average of 1.3 or higher, or
- (c) A C average or higher on completion of all published requirements for junior standing in a college or school in the University.

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

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

- (a) *University Extension*: University Extension offers both class and correspondence courses. At Berkeley and at Los Angeles special programs

of class courses are offered for students attempting to remove admission deficiencies. Only students with 5 units or less of scholarship deficiencies in their high school records are eligible for the special programs. Other courses, class or correspondence, are not restricted, but the applicant should have all courses he undertakes approved in advance by the Office of Admissions to insure that they will be acceptable. To make up deficiencies in scholarship, grades received in this program must be definitely above the grade C average, and must serve, not merely as specific make-up of deficiencies, but also as a demonstration of ability to do college work successfully.

- (b) *Combination Program of the College of Agriculture at the University of California, Davis*: For high school graduates with not more than three subject deficiencies among which may not be included algebra or plane geometry, a combination program is offered in the College of Agriculture of the University of California, Davis. See PROSPECTUS OF THE COLLEGE OF AGRICULTURE.
- (c) *Summer Session*: For students with only one or two deficiencies a six-week summer session or an eight-week summer session at the University of California or at an approved university, college, or junior college, may be used to make up the shortages, if the records are received in time for clearance. Summer Session programs should be approved in advance by the Office of Admissions.

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

4. By postgraduate courses in accredited high schools.

5. As an alternative to making up high school subject deficiencies, an applicant 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 a school or college of the University.

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

Admission in Advanced Standing

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

- (1) He has satisfied, through either high school or college courses, the subjects required for admission of high school graduates in freshman standing.
- (2) His advanced work, in institutions of college level, has met the minimum scholarship standard required of transferring students (namely, an average of grade C or higher in all college courses undertaken, including at least a C average in the last institution attended).
- (3) He is entitled to return as a student in good standing to the last college attended.

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

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

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

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

Extension courses taken at some institution other than the University of California may not be acceptable. The decision as to their acceptability rests with the Office of Admissions. If such a program is planned with the intention of applying it toward a degree at the University of California, it is wise to have the approval of the Office of Admissions in advance.

Removal of Scholarship Deficiencies by Applicants from Other Colleges

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

SPECIAL REQUIREMENTS FOR ENGINEERING

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

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

LIMITATION OF ENROLLMENT OF OUT-OF-STATE APPLICANTS

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

vanced Standing) the following special regulations apply to nonresident applicants. (Children of alumni of the University of California and residents of Hawaii are not subject to the special nonresident requirements for admission.)

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

1. *Out-of-state Scholarship Requirement:*

A. *High School:*

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

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

B. *Advanced Standing:*

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

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

A. *College Entrance Examination Board Scholastic Aptitude Test:*

Arrangements to take the CEEB test must be made through the Educational Testing Service, Box 592, Princeton, New Jersey, or Box 9896 Los Feliz Station, Los Angeles 27, California.

B. *American Council on Education Psychological Examination—College Level:*

Arrangements to take the college level ACE Examination may be made either through the applicant's own school or through the Office of Admissions of the University of California. In contacting the Office of Admissions, the applicant should submit the name and address of a responsible school official who has agreed to administer the examination. Arrangements to take the examination through the University should not be made until formal Application for Admission to the University has been filed.

Upper Division: Applicants from other states who present 60 or more semester units of advanced standing credit, according to the evaluation by the Office of Admissions are admitted under regular rules (see section on admission in advanced standing) except that in addition to submitting the usual transcript, they must also submit a score on the College Transfer Test. This examination is administered by the Educational Testing Service, Box 592, Princeton, New Jersey, or Box 9896 Los Feliz Station, Los Angeles 27, California.

ADMISSION OF RETURNING MEMBERS OF THE ARMED FORCES

Some exceptions in the subject requirements for admission will be made for men and women whose schooling has been appreciably delayed by service in the armed forces. Such exceptions will apply, however, only when the scholarship record is high enough to indicate probable success in the University. Veterans whose scholastic records are good, and 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 exchange of necessary correspondence relative to entrance and, if the applicant is admitted, will be of assistance to him in obtaining the necessary passport visa.

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

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

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

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

LATE ADMISSION AND REGISTRATION

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

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

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

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

ADMISSION IN GRADUATE STANDING

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

California as well as to those outside. *Registration will not in any case be permitted until all official records and official evidence of degrees conferred have been received.*

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

A formal application is required of all persons seeking admission to the Graduate Division (Northern Section) of the University of California. The application blank may be obtained by addressing the Dean of the Graduate Division, 102 Administration Building, University of California, Berkeley 4, and must be filed at the office of the Dean of the Graduate Division, preferably twelve weeks prior to the date of registration; 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, registration may be delayed, and the applicant made liable for the late registration fee of \$2.

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

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

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

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

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

* Veterans who expect to enroll under the provisions of Public Law 846 (the G. I. Bill of Rights) or Public Law 16 are not required to remit this fee with their applications. Persons governed by Public Law 550 ("Korean" G. I. Bill) must pay this fee from their allotment.

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

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

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

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

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 30.

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

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

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

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

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

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

MEDICAL AND PHYSICAL EXAMINATION

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

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

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

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

STUDENT HEALTH SERVICE

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

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

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

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

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

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

PHYSICAL EDUCATION AND USE OF GYMNASIUMS

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

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

SUBJECT A: ENGLISH COMPOSITION

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

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

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

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

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

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

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

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

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

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

AMERICAN HISTORY AND AMERICAN INSTITUTIONS

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

1. By passing an examination in each of these subjects. The passing of these examinations will not entitle the student to receive unit credit.
2. By completing one course in each of the following groups:*
 - (a) *American History*: Economics 113, History 8B, XB8B (University Extension), 17A, 17B, XB17A, XB17B (University Extension), 167A, 167B, 170A, 170B, 171A, 171B, 172A, 172B, 173A, 173B, 173C, 174A, 174B, 175A, 175B, 176A, 176B, 177A, 177B, 187A, 187B.
 - (b) *American Institutions*: Political Science 1, XB1 (University Extension), 100A, 101A, 102A, 104A, 105A, 157A, 157B, 163, Speech 137.

Any one of the above courses offered in the Summer Session is acceptable. It is permissible to meet one requirement by completing one of the approved courses, and the other requirement by passing the examination in that subject. Students who have met the former combined American History and Institutions requirement prior to the opening of the fall semester, 1953, will not be held to meet the above revised requirements.
3. (a) By automatic equivalence granted for courses offered by collegiate institutions within the State of California in those cases where an official transcript of record from such an institution indicates satisfaction of the requirements by such courses.
- (b) By presenting a certificate of completion of acceptable courses at other collegiate institutions. Certificates may be obtained from the office of the Supervisor.

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

Further information regarding these requirements, and the examination necessary to meet them, may be obtained from the Supervisor, Room 23, Wheeler Hall. For office hours, see official announcements on campus bulletin boards.

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

THE RESERVE OFFICERS' TRAINING CORPS

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

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

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

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

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

Air Science

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

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

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

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

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

Successful completion of the advanced course and four years of education culminating in the award of a bachelor's degree qualifies the student for appointment as a Second Lieutenant in the Air Force Reserve.

Military Science

The mission of the Army Reserve Officers' Training Corps is to train students to serve as junior officers in the United States Army Reserve and in the Regular Army.

The Army R.O.T.C. program consists of three phases: 1) the basic course, 2) the advanced course, and 3) summer camp. Military leadership is emphasized throughout the course of instruction.

The first year of the lower division (basic) course includes an introduction to the organization of the Armed Forces, a study of the historical background of the current military problems, the organization and function of the present military establishment, and basic military instruction common to all branches of the Army. In the second year of the basic course, students elect one of eight branches of the Army—Infantry, Corps of Engineers, Signal Corps, Artillery (Antiaircraft), Ordnance Corps, Quartermaster Corps, Transportation Corps, and Military Police Corps—in which they receive introductory instruction in subjects pertaining to the branch selected, in addition to instruction common to all branches.

Branch selection in the second year is based upon the student's academic major or his desire to pursue the advanced course and earn a commission in a particular branch of the Army.

The upper division (advanced course) is open to enrollment by students who successfully complete the basic course or who have received credit for military service in lieu thereof. In general, students selected for this course are those who have shown potentialities for leadership and command, and whose aptitude insures their development into efficient officer material. The advanced course includes instruction in branch tactics and techniques and in subjects general to all branches, such as military law, administration, logistics, psychological warfare, command and staff relationships, and geo-

politics. The summer camp consists of a six-week program conducted on an Army post. Its objective is to familiarize the student with Army life and to afford practical training not available at the University.

Successful completion of the Army R.O.T.C. course, and four years' education of the college level, qualifies the student for appointment as a Second Lieutenant in the United States Army Reserve. Appointments are offered in the eight branches in which instruction is offered, and in the Chemical Corps, Finance Corps, and Military Intelligence.

Naval Science

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

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

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

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

STUDY-LIST REGULATIONS

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

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

The various colleges observe certain study-list limits with which the student

must comply. For detailed regulations, see the announcements of the respective colleges in later pages of this bulletin.

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

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

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

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

CANDIDACY FOR DEGREES

Every student who intends to become a candidate for a bachelor's degree or the degree of Associate in Arts must file with the Registrar, on a date to be fixed by the Registrar, an announcement of candidacy for the degree. For filing this announcement later than the appointed date, a fee of \$2 is charged. In 1953-1954 these dates are: Thursday, October 1, for candidates who expect to complete their work in January, 1954, and Thursday, February 25, for candidates for graduation in June, 1954.

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

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

CHANGE OF COLLEGE OR MAJOR

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

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

HONORS

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

or in the schools of Architecture, Business Administration, 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, and Pharmacy (on the Berkeley campus); 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.

Colleges of Chemistry and Engineering—

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

School of Optometry—

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

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

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

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

A student in the School of Optometry who becomes subject to the provisions of this regulation will be under the supervision of the Faculty of the School. The faculty may dismiss from the University students under its supervision, or at its discretion may suspend the provisions of this regulation and permit the retention in the University of 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 and the College of Pharmacy on the San Francisco campus—

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

CREDIT BY EXAMINATION

Provision is made whereby an undergraduate student in residence and in good standing may under certain conditions take examinations for degree credit either (a) in courses offered in the University, without formal enrollment in them, or (b) in subjects appropriate to the student's curriculum, but not offered as courses by the University. The results of all such examinations, with grades and grade points, are entered upon the student's record in the same manner as for regular courses of instruction (see Grades of Scholarship, page 41). No fees are required.

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

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

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

FINAL EXAMINATIONS

Final examinations are obligatory in most undergraduate courses. Each course in which a final examination is not required is so indicated in the SCHEDULE OF 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 student (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.

STUDENT CONDUCT AND DISCIPLINE

When a student enters the University it is taken for granted by the University authorities that he has an earnest purpose and that his conduct will bear out this presumption. If, however, he should be guilty of unbecoming behavior or

should neglect his academic duties, the University authorities will take such action as, in their opinion, his conduct warrants. Students who fail to make proper use of the opportunities freely given to them by the University must expect to have their privileges curtailed or withdrawn.

MISCELLANEOUS INFORMATION

SITE, CLIMATE, AND TRANSPORTATION

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

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

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

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

EXPENSES OF STUDENTS

General Expenses and Fees

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

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

Expense Items	Minimum		Moderate		Liberal	
	Men	Women	Men	Women	Men	Women
Incidental Fee	\$ 74.00	\$ 74.00	\$ 74.00	\$ 74.00	\$ 74.00	\$ 74.00
Books and Supplies	40.00	40.00	48.00	48.00	60.00	60.00
A.S.U.C. Membership	15.00	15.00	15.00	15.00	15.00	15.00
Board and Room	*420.00	*460.00	700.00	700.00	900.00	1000.00
Miscellaneous (cleaning, laundry, drugs, etc.)	75.00	100.00	100.00	150.00	200.00	200.00
Total	\$624.00	\$689.00	\$937.00	\$987.00	\$1249.00	\$1349.00

* Minimum cost includes five hours work per week.

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

Incidental fee.—The incidental fee is \$37 each semester, for both undergraduate and graduate students. This fee, which must be paid at the time of registration, covers certain expenses of students for use of laboratories, and library books, for athletic and gymnasium facilities and equipment, for lockers, for registration and graduation, for counseling service, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service with the aid of the visiting staff at Cowell Memorial Hospital and not elsewhere. No part of this fee is remitted to those students who may not desire to make use of all or any of these privileges. Payment by check, draft, or money order must be for the exact amount of the fees, and should be made payable to The Regents of the University of California. If a student withdraws from the University within the first five weeks from the first day of registration for the semester, a part of the incidental fee will be refunded.

Students who are classified as nonresidents of the State are required to pay each semester, in addition to the incidental fee, a tuition fee of \$150. It is important for every prospective student to note carefully the rules governing legal residence in the University, which are stated on page 51. 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 \$40 to \$60 a year. Books and special equipment for students in the preprofessional and professional schools cost from \$50 to \$200. Exact information on these items may be obtained by writing directly to the school or department. Women students taking physical education are required to buy shoes which cost about \$4. Students failing the required examination in Subject A must pay a fee of \$20 for the course in Subject A (see page 35).

Membership in the Associated Students of the University costs \$15 each year (fall and spring semesters), and though membership is not obligatory, it is advisable. A membership card entitles the holder to a subscription to the student newspaper, the *Daily Californian*; membership in the Henry Morse Stephens Memorial Student Union, which is the center of campus life; privilege of admission free or at reduced rates to athletic contests; and participation in all student affairs, including athletic, student body, and class activities.

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

Tuition.—The University charges a tuition fee to every student who has not been a legal resident of the State of California for a period of one year immediately preceding the opening day of the semester during which he proposes to enroll. Such a student is classified as a nonresident. A student entering the University for the first time should read carefully the rules governing determination of residence, as quoted below, that he may be prepared, in the event of classification as a nonresident, to pay the required tuition fee. This fee must be paid at the time of registration. *The attention of all prospective students, especially those who have not attained the age of 22 years and whose parents do not live in the State of California, is directed to the fact that the presence in the State of California for a period of more than one year immediately preceding the opening day of the semester during which it is proposed to attend the University, does not, of itself, entitle the student to classification as a resident.* Every alien student shall be deemed to be a nonresident student unless he has been lawfully admitted to the United States for permanent residence in accordance with all applicable provisions of the laws of the United States.

Tuition in the academic colleges is free to students who have been residents of the State of California for a period of one year immediately preceding the opening day of the semester during which they propose to attend the University. Students who are classified as nonresidents are required to pay a tuition fee of \$150 each semester. This fee is in addition to the incidental fee. Exceptions will be limited to *graduate* students who are unable to devote more than half time to academic study 1) for reasons of health as certified by the Student Health Service, or 2) for reason of full-time employment in salaried positions as certified by a statement from the employer. Where exceptions are made on the foregoing bases, the student's program will be limited to 4 units of course work in the "200" series or the equivalent thereof, and the nonresident tuition fee will be \$75 a semester. Petition for half fee based on the above criteria must be submitted to the Office of the Dean of the Graduate Division; otherwise, all students are presumed to be full-time students, irrespective of the number of units for which they are enrolled. On the approval of the Dean of the Graduate Division, the nonresident tuition fee may be remitted in the case of graduate students in the academic departments who are admitted without deficiencies, who have proved that they are distinguished scholars, and who are carrying full programs toward the fulfillment of requirements for academic higher degrees. See further the ANNOUNCEMENT OF THE GRADUATE DIVISION.

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

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

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

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

LIVING ACCOMMODATIONS

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

versity of California Village. Applications for these apartment units may be made by calling in person or writing to the Housing Office. Information concerning the Richmond Federal Housing Authority will also be sent on request.

The price of room and board depends upon the type of accommodations desired. In the Residence Halls, owned and operated by the University, the estimated price is between \$335 and \$400 a semester. This price includes three meals per day. In the boarding houses for men, the price for a semester is between \$270 and \$315 a semester, and the boarding houses for women \$270 and \$390. The prices quoted for most boarding houses do not include the price of lunches and Sunday meals, which average \$125 to \$150 a semester. In cooperative houses for single men, the price is approximately \$200 to \$215 a semester plus five hours of work a week. In cooperative houses for single women, the price is between \$200 and \$225 a semester plus five hours of work a week. Rooms in private homes and apartments vary greatly in price depending upon size and location.

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

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

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

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

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

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

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

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

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

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

BUREAU OF OCCUPATIONS

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

STUDENT EMPLOYMENT

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

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

The undergraduate curricula are organized on the assumption that the student will give the major part of his time and attention to his studies. A student

who is largely self-supporting must consider at the outset the possibility of taking more than the minimum number of semesters required to obtain a degree, if he is to maintain his scholastic standing and his health, and to enjoy the advantages of University life. The student who is not physically strong and in good health should not attempt to be entirely self-supporting at the expense of health and academic standing.

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

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

SENIOR AND ALUMNI EMPLOYMENT

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

BUREAU OF SCHOOL AND COLLEGE PLACEMENT

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

OFFICE OF TEACHER PLACEMENT

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

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

COUNSELING CENTER

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

Problems of study methods, reading, concentration, and the like, should not be allowed to interfere with a student's academic success. Nor should his efforts be misdirected simply because he lacks knowledge concerning the relationship of his individual aptitudes to specific occupational and training requirements in a given field.

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

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

VETERANS INFORMATION

Dean of Students—Special Services maintains liaison between veterans and the Veterans Administration, the State Department of Veterans Affairs, and other agencies offering veterans educational benefits; and assists veterans in becoming assimilated into the life and spirit of the University. On the Berkeley campus, this office is located at 2227 Union Street. Offices of the United States Veterans Administration are located as follows: Regional Office, 49 Fourth Street, San Francisco 3, California; Regional Office, 1380 South Sepulveda Boulevard, Los Angeles 25; Regional Office, 325 B Street, San Diego 1, California.

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

Veterans who transfer to another campus of the University within the jurisdiction of the same Veterans Administration Regional Office and with no change of objective (or degree) and whose training under Public Law 346 has not been interrupted in excess of four months, need present only a Veterans Transfer Notice from the last campus attended. A veteran must present a supplemental certificate if (1) he has been out of training more than four months; (2) he has not completed the last term or session in which enrolled under veterans benefits; (3) he has attended any other institution; (4) he has last attended University Extension; or (5) he last attended a campus within the regional jurisdiction of a different Veterans Administration region, in which event the veteran should also request a transfer of his files to the proper regional office.

Information regarding educational benefits available from the State of California (CVEI) may be obtained from the State Department of Veterans Affairs located at 700 Capitol Avenue, Sacramento, California; or by writing

either to 357 South Hill Street, Los Angeles, California; or 515 Van Ness Avenue, San Francisco, California.

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

SELECTIVE SERVICE

Matters relating to the deferment of students eligible under Selective Service are handled by the Supervisor of Special Services, Office of the Dean of Students, 201 Administration Building. Certifications regarding enrollment, class standing and other pertinent information will be submitted to the student's Selective Service Board upon request. To be considered for deferment by Selective Service, the student must be pursuing a full-time course of instruction which for undergraduates consists of at least 15 units. This does not include non-credit courses such as Subject A. To qualify as a full-time graduate student, the student must be in residence, actually spend full time on his studies, and meet the criteria generally applied for normal progress toward the degree—i.e., two years or less for the Master's Degree and four years or less for the Doctor's Degree (including time spent working toward the Master's Degree; if taken). Students desiring deferment on the basis of enrollment in the University R.O.T.C. programs should consult the proper R.O.T.C. department.

SCHOLARSHIPS, PRIZES, LOANS

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

Scholarships and fellowships.—A circular giving information about undergraduate scholarships may be obtained from the Committee on Undergraduate Scholarships, 201 Administration Building. Students who maintain an excellent scholarship standing are eligible to make application. Awards are made on the basis of scholarship, financial need, and character and promise. Holders of undergraduate scholarships must carry a minimum of 12 units a semester. Applications for scholarships must be filed with the Committee on Undergraduate Scholarships by mail or in person for the succeeding academic year (September through June), or either semester thereof, during the following periods: Applicants in residence at the University file applications between December 1 and December 31. Entering students file applications between December 1 and March 1 (March 2 when March 1 falls on Sunday). *Under no circumstances will applications be accepted after these dates.* Application forms are available in the office of the Committee on Undergraduate Scholarships, 201 Administration Building, each year from the beginning of the last week in November.

Information about fellowships for graduate students may be obtained from the Dean of the Graduate Division. Fellowships and graduate scholarships are ordinarily awarded as a mark of honor, on the basis of scholarship, not of need. The holders of fellowships or graduate scholarships are expected to 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 16, 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 35.)

Military science and tactics, 8 units. (See page 38.)

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

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

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

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

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

Anthropology 1.

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

Bacteriology 1*, 2*.

Botany 1*, 12, 16*.

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

‡Geography 1.

Geology 1 or 10, 3, 5.

Paleontology 1, 10.

* Will be accepted as a laboratory course.

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

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

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

Physiology 1, 1L*

Zoology 1A*, 1B*, 10.

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

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

(1) English, speech.

(2) Foreign language (additional to *b*). This may be satisfied by one college course of not less than four units, or by two years of high school Latin.

(3) Mathematics. This may be satisfied partly in the high school, as indicated below

(4) Social sciences.

(5) Philosophy.

(6) Fine arts (architecture, art, music) and literature. This may be satisfied by two or more courses which may or may not form a sequence.

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

Group 1—English and Speech

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

Group 2—Foreign Languages

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

Dutch: 1, 2.

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

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

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

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

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

Portuguese: 1, 21, 122, 123.

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

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

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

Group 3—Mathematics

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

Group 4—Social Sciences

Anthropology 2A-2B.

Classics 10A-10B.

Economics 1A-1B.

* Will be accepted as a laboratory course.

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

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

Group 5—Philosophy

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

Group 6—Fine Arts and Literature

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

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

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

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

Upper Division Requirements

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

1. The total number of units in college courses in the lower and upper divisions offered for the degree must be *at least* 120, of which at least 108 must be in courses chosen from the Letters and Science List of Courses (see page 76). 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

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

grade-point average of not lower than 1.5 in the work undertaken during the junior and senior years.)

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

4. The requirement of American History and American Institutions must be completed by all candidates for the bachelor's degree. Students may complete this requirement by passing examinations in American History and American Institutions, for which no unit credit will be assigned; by completing certain courses; by automatic equivalence granted for courses taken at a collegiate institution in California where it is indicated on the student's official transcript from the institution that the requirement has been satisfied; or by presentation of a certificate of completion of acceptable courses at another collegiate institution (see American History and American Institutions, page 36).

5. At least 36 units of work chosen from the upper division courses named in the Letters and Science list (see page 76), 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 39.

Organized Majors and Professional Curricula

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

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

- | | |
|--|------------------------------------|
| American Civilization | Labor and Industrial Relations |
| Anthropology | Latin. See Classics |
| Art | Mathematical Statistics. See |
| Astronomy | Mathematics |
| Bacteriology | Mathematics |
| Biochemistry | Medical Sciences |
| Botany | Music |
| Chemistry | Near Eastern Languages |
| Child Development | Oriental Languages |
| Chinese. See Oriental Languages | Paleontology |
| Civilization of the Middle Ages | Philosophy |
| Civilization of the Nineteenth Century | Physical Education |
| Classics | Physics |
| Communication and Public Policy | Physiology |
| Decorative Art | Political Science |
| Dramatic Art | Premedical Curriculum. See Medical |
| Dramatic Literature | Sciences |
| East Asiatic Studies | Psychology |
| Economics | Public Speaking. See Speech |
| Education | Recreation |
| English | Regional Group Majors |
| French | Renaissance, The |
| Geography | Scandinavian |
| Geological Sciences | Sculpture |
| Geophysics. See Geological Sciences | Slavic Languages and Literatures |
| German | Social Welfare |
| Greek. See Classics | Sociology and Social Institutions |
| History | Spanish |
| International Relations | Speech |
| Italian | Wildlife Conservation |
| Japanese. See Oriental Languages | Zoology |
| 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. A student must maintain an average of 1.5 in courses of the major in order to continue in the major.

CHILD DEVELOPMENT

Group Major Advisers: Miss LANDRETH, Mr. VINCENT.

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

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

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

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

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

CIVILIZATION OF THE MIDDLE AGES

Adviser: Mr. WALPOLE.

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

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

The Major.—French 122A–122B; History 121A–121B; Italian 109A–109B or Italian 150A–150B; Art 175C (or, when this is not offered, 175A or 175B); a course in Medieval Thought such as History 125A–125B, or a suitable course

in Medieval Philosophy. A minimum of 9 units selected from the following list: German 118A, 135A-135B; Spanish 107A, 112A; History 122, 123, 152; Classics 180B; English 151L, 155.

CIVILIZATION OF THE NINETEENTH CENTURY

Adviser: Mr. ROWBOTHAM.

Preparation for the Major.—Required: English 1A-1B, 46B; History 4A-4B; Philosophy 20A-20B; Economics 1A-1B; Art 1B or Music 27B or 21B. Recommended: English 41; 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, Slavic Languages and Literatures 130; 6 units from: History 134A-134B, 145, 146, 150; 9 units from: Economics 101A-101B, 106A-106B, 150, 152, 188A, 190A-190B, Political Science 118A-118B, 129; 6 units from: Philosophy 103 and Philosophy 108 or 146.

COMMUNICATION AND PUBLIC POLICY

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

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

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

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

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

DRAMATIC LITERATURE

Group Major Adviser: Mr. ULMAN.

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

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

The Major.—Thirty units, of which the comprehensive examination counts for 3 units. Required: English 114A-114B and one of the Shakespeare courses

(English 117A-117B, 117E); Dramatic Art 160A-160B; 6 units selected from Philosophy 136A-136B-136C, 146, Dramatic Art 130, 135, 140A-140B.

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

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

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

EAST ASIATIC STUDIES

Advisers: Mr. BINGHAM, Mr. EBERHARD.

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

Attention is called to the fact that students interested in the Far East may, if they wish, offer programs under the regional group majors on China, Japan, and Southeast Asia (see pages 72, 73 and 74).

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

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

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

International relations embraces those social relationships which transcend the boundaries of national states. The major in international relations is devised to meet the needs of students interested in acquiring an understanding of the forces and influences conditioning present-day world politics, as well as the main problems and policies of organized states in their relations with one another in the twentieth century. These problems and policies must be dealt with and determined by governments, and consequently the major is built around courses dealing with intergovernmental legal, diplomatic, and economic relations. But the major cuts across departmental lines, for statesmen develop their policies in relation to geographic, economic, and social conditions, and in the light of historic policies. History reveals these traditional policies, regional geographic and anthropological studies provide an acquaintance with relevant physical and biological factors, and social psychology contributes to an understanding of nationalism and other phenomena in the field of study. Courses in other fields likewise make their contribution.

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

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

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

LABOR AND INDUSTRIAL RELATIONS

Group Major Adviser: Mr. Ross.

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

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

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

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

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

MEDICAL SCIENCES

Candidates for the degree of A.B. in the College of Letters and Science who plan to pursue the four-year curriculum leading to the M.D. degree in the School of Medicine may reduce by one year the total time for attaining the two degrees, by offering the first year of the School of Medicine curriculum as the senior 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 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 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 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. 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; ‡3 units of a modern foreign language. Psychology 160, 168 and Public Health 160A, 160B are recommended strongly.

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, SAN FRANCISCO.

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

* For regulations concerning Subject A, see page 35; American History and American Institutions, page 36.

† 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

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: Mr. 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 ESPENSCHADE. For men—Mr. COZENS, Mr. HENRY, Mr. MILLER, Mr. STONE.

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

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

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

RECREATION

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

The group major in recreation is administered by a special committee of the College with 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.

the student fails to pass the examination in Subject A it will be necessary to postpone English (or speech) until he has completed the course in Subject A, for which no credit in units is given. The student is advised to substitute in the interim one of the year courses which are required for requirement (e) for the degree of Associate in Arts in place of English (or speech).

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

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

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, 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: Oriental Languages 12A-12B, 13, 14, 17 and two of the following: Anthropology 2A-2B; Art 1D; Economics 1A-1B; Geography 1-2, 5A-5B; Oriental Languages 38A-38B or Political Science 1-2. The 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 and 143C. An additional 6 units are to be selected from courses dealing with China or the Far East.

Regional Group Major on France and French Colonies

Advisers: Mr. FAY, Mr. PALM, 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; History 141, 148; Political Science 123, 124, 127, 129, 143D, 147A, 185.

Regional Group Major on Germany and Central Europe

Advisers: Mr. KERNEB, 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 147B. Recommended: German 112; History 144A-144B, or 145 and 146, or 136A-136B, or 140A-140B.

Regional Group Major on Hispanic America

Adviser: Mr. MOSK.

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

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

Regional Group Major on Japan

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

Preparation for the Major.—Required: Oriental Languages 9, 17, and 19; and two of the following: Anthropology 2A-2B; Art 1D; Economics 1A-1B; Geography 1-2, 5A-5B; Oriental Languages 38A-38B or Political Science 1-2. The 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; Oriental Languages 122 and 132; Political Science 145. An additional 6 units are to be selected from courses dealing with Japan or the Far East.

Regional Group Major on Russia and Eastern Europe

Advisers: Mr. MASLENIKOV, Mr. KERNER.

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

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

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

Regional Group Major on Southeast Asia

Advisers: Miss HAAS, Mr. GIFFORD.

Preparation for the Major.—Required: (emphasis on Indonesia) 8 units of Dutch; or (emphasis on continental Southeast Asia) 16 units of French. In addition, all students, regardless of emphasis, are required to take any two of the following courses: Anthropology 2A-2B; Economics 1A-1B; Geography 1, 2 or Political Science 1, 2. Recommended: Oriental Languages 38A-38B.

The Major.—Required: (emphasis on Indonesia) Oriental Languages 108, 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 Geography 125A and 21 units from courses dealing with South Asia, selected in consultation with the adviser. Recommended: Near Eastern Languages 125 and Sanskrit 190A-190B.

RELIGION

Students interested in the study of religion, either from the standpoint of liberal education, or of preparation for the ministry or some other phase of religious education, may select a major in one of the departments germane to the purposes of the student, or they may propose an individual group major (see page 65), or they may elect a suitable combination of courses under the general curriculum (see page 58).

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

THE RENAISSANCE

Group Major Adviser: Mr. CLINE.

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

Preparation for the Major.—Required: English 1A-1B, 46A; History 4A;

Philosophy 20A-20B. Recommended: A reading knowledge of Latin, French, German, Spanish, or Italian.

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

SCULPTURE

Group Major Adviser: Mr. 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 166 (3); Decorative Art 180B (3); Philosophy 136B (3).

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

SOCIAL WELFARE

Group Major Adviser: Mr. FRIEDLANDER.

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

- (a) Those who propose to take graduate professional 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, 103A, 102A, 181; 9 units from Social Welfare 106, Anthropology 118A-118B, Economics 106A-106B, Economics 150 or Business Administration 150, Economics 180, Psychology 145, Sociology and Social Institutions 148; 9 units from Social Welfare 101A-101B, 108, Architecture 117, Economics 185, Physical Education 140, Public Health 106, Sociology and Social Institutions 161.

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

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

WILDLIFE CONSERVATION

Group Major Adviser: Mr. LEOPOLD.

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

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

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

Preparation for the Major.—Lower division. Required: Botany 1; Chemistry 1A and 8; Engineering 1A or 21; 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: Biochemistry 102; Botany 108; Forestry 101 and 103; Entomology 114 or 133; 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.

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

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

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

- Agricultural Economics 112A, 112B, 120.
- Anatomy. All undergraduate courses.
- Anthropology. All undergraduate courses.
- Architecture 5A, 5B, 5C, 5D, 14A, 14B, 113A, 113B, 114A, 114B, 117, 146, 148A, 148B.
- Art. All undergraduate courses.
- Astronomy. All undergraduate courses except 3 and 11.
- Bacteriology. All undergraduate courses.
- Biochemistry. All undergraduate courses.
- Botany. All undergraduate courses except 155.
- Business Administration 1A, 1B, 10, 18, 100, 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.
- Comparative Literature. 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, 110, 112, 117, 119, 126, 127, 129, 131, 133.
- Forestry 1, 103, 122, 125.
- French. All undergraduate courses except 20.
- Genetics. All undergraduate courses.
- Geography. All undergraduate courses.
- Geological Sciences. All undergraduate courses.
- German. All undergraduate courses.
- Greek. All undergraduate courses.
- History. All undergraduate courses.
- Italian. All undergraduate courses.
- Journalism 120A, 120B, 140, 141, 190, 195, 199.
- Latin. All undergraduate courses.
- Linguistics. All undergraduate courses.
- Mathematics. All undergraduate courses except 107, 142A, 142B, 142C, 142D, 144.
- Medico-Military Science and Tactics 121A, 121B.
- Music. All undergraduate courses; a total of not more than 8 units from the following courses will be accepted as Letters and Science credit: 43, 48, 143, 148.
- Near Eastern Languages. All undergraduate courses.
- Optometry (see *Physiological Optics*, below).
- Oriental Languages. All undergraduate courses.
- Paleontology. All undergraduate courses.
- Philosophy. All undergraduate courses.
- Physical Education 105.
- Physics. All undergraduate courses except 125, 128, 128L, 131.
- Physiological Optics 105A, 105B, 106A, 106B.
- Physiology. All undergraduate courses.
- Plant Biochemistry 123.
- Plant Nutrition 115, 117.
- Political Science. All undergraduate courses except 183.
- Psychology. All undergraduate courses except 3, 104, 114, 116, 117, 180, 185, 186.

Public Health 5A, 5B, 35, 106, 160A, 160B, 163.	Sociology and Social Institutions. All undergraduate courses.
Sanskrit. All undergraduate courses.	Soil Science 110, 111, 112, 113, 114.
Scandinavian. All undergraduate courses.	Spanish and Portuguese. All undergraduate courses.
Slavic Languages and Literatures. All undergraduate courses.	Speech. All undergraduate courses.
Social Welfare 100, 106, 110A, 110B.	Zoölogy. All undergraduate courses except 109, 116, 119A-119B, 120A-120B, 145.

HONORS

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

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

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

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

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

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

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

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

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

study list. The status of a course taken on the "passed" or "not passed" basis may not be changed after the last day on which the student is permitted to add a course to the study list.

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

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

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

Honors with the Bachelor's Degree

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

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

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

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

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

COLLEGE OF AGRICULTURE

The prospective student should read the requirements and recommendations for admission on pages 22-32. Entrants will be seriously handicapped in undertaking most of the lower division courses required in the various curricula of the College of Agriculture unless they have completed as a part of or in addition to those subjects required for admission, the following subjects in high school: algebraic theory, $\frac{1}{2}$ or 1 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, Los Angeles, and Riverside) 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 35).
 - (b) *Air Science or Military or Naval Science (for male students)* (see page 37).
 - (c) *American History and American Institutions.*—The student may meet this requirement by passing examinations in American History and American Institutions or by completion of courses prescribed by the University (see page 36).
 - (d) *Residence in the University during the senior year* in the college in which the degree is to be taken.
 - (e) *Attain at least as many grade points as units of credit* in courses undertaken at this University.
2. Satisfy the general requirements of the College of Agriculture as follows:
 - (a) *At least 124 units of University work.* Not more than 4 units may be in lower division physical education courses.
 - (b) *Thirty-six units of the above total must be in upper division courses* (Courses numbered 100–199)
 - (c) *Nine units of mathematics.* Matriculation work may be offered toward this requirement, counting each year of high school work as 3 units. Trigonometry in high school is recommended as partial satisfaction of this requirement. 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 or zoölogy (including at least 5 units of chemistry and 3 units of physics)	18 units
*Mathematics (analytic geometry and calculus)	6
English or speech	6
Principles of economics	6
Accounting	3
Statistics	3
Anthropology, geography, history, philosophy, political science, psychology, or sociology and social institutions	12
Agriculture (other than agricultural economics)	8
Military science	8
	70 units

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

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

(a) CURRICULUM IN AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

Chemistry	13 units
Physics	6
Botany and zoölogy (including laboratory); and additional botany, zoölogy, or bacteriology.....	12
Soil science or geology.....	3
Genetics	4
Economics	6
English and/or speech.....	6
Military science	8
	<hr/>
	58 units

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

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

CURRICULUM IN AGRICULTURAL ENGINEERING

The Curriculum in Agricultural Engineering is offered in the College of Engineering. See page 99.

(a) CURRICULUM IN ANIMAL SCIENCE

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

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

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

(a) CURRICULUM IN ENTOMOLOGY AND PARASITOLOGY

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

 69 or 70 units

(b) 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.)

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

(a) CURRICULUM IN FOOD SCIENCE

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

 72 or 70 units

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

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

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

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

(b) 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 (or 135), 140, 141 (or 142), 144, 162, 175; Decorative Art 6A, 6B, 130A, Architecture 110.

Child Development and Family Relationships Major:

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

Clothing and Textiles Major:

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

Family Economics Major:

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

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

[‡] This requirement is based on Botany 1 as given at Berkeley.

Food Chemistry and Technology Major:

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

Nutrition and Dietetics Major:

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

(a) CURRICULUM IN IRRIGATION SCIENCE†

Mathematics (including integral calculus).....	6 units
Chemistry	16
Physics (including laboratory).....	8
Botany (including plant physiology).....	9
Engineering (surveying)	3
Bacteriology	4
Economics	3
Geology	3
English and/or speech.....	6
Soils	8
Military science	8

 74 units

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

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

(a) CURRICULUM IN LANDSCAPE ARCHITECTURE

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

 66 or 70 units

(b) 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.)

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

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

(a) CURRICULUM IN PLANT SCIENCE

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

73 units

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

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

Certain courses are required by the majors mentioned under (b) above. See the PROSPECTUS OF THE COLLEGE OF AGRICULTURE for details.

(a) CURRICULUM IN RANGE MANAGEMENT

Chemistry (general inorganic, organic)	8 units
Zoölogy (general)	8
Botany (general, plant physiology)	9
English and/or speech (composition and/or elements of speech)	6
Geology or soils (structural geology or elements of soil science)	3 or 4
Engineering (plane surveying)	3
Physics (mechanics, heat, light, electricity)	6
Economics (principles) or economics (principles) and agricultural economics	6
Animal husbandry (judging, feeds and feeding, management, meat production)	10
Agronomy (crop production, forage crops, range plants)	9
Forestry (range management, forest ecology, range techniques, range utilization, grassland ecology)	12
Soils (medium for plant growth)	4
Military science	8

92 or 93 units

(b) In addition, students must take at least 15 units restricted electives to be selected with the approval of the major adviser.

(c) In addition to the above, every student must complete the summer practice course in range management (Forestry 49R).

* 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.

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

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

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

CURRICULUM IN PREVETERINARY SCIENCE*	
English composition and additional English or speech.....	6 units
Chemistry (general, inorganic, organic, and analytical).....	16
Zoölogy (including embryology).....	10
Physics (mechanics, heat, light, electricity).....	6
Restricted electives†.....	15
Electives.....	10
Military science‡.....	8
	71 units

Freshman and Sophomore Years

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

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

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

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

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

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

AGRICULTURAL ECONOMICS

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	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 1A-1B	3	3	Physics 2A-2B	3	3
Mathematics 16A-16B ...	3	3	Physics 3A-3B	1	1
Agricultural Engineering 12 .....	..	2	Geology 1	3	..
			Poultry Husbandry 1....	3	..
			Elective .....	..	3
	16	16		15	15

AGRICULTURAL EDUCATION AND GENERAL AGRICULTURE

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

ANIMAL SCIENCE

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	Fall Units	Spring Units		Fall Units	Spring Units
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	..
	16	16	Physiology 1L	2	..
				17	17

ENTOMOLOGY AND PARASITOLOGY

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	Fall Units	Spring Units		Fall Units	Spring Units
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
	15	16	Electives	6	..
				16	16

FOOD TECHNOLOGY

<i>Freshman Year</i>			<i>Sophomore Year</i>		
	Fall Units	Spring Units		Fall Units	Spring Units
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	..
	15	16	Speech 1B	3	..
				18	17

PREFORESTRY

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Chemistry 1A, 8	5	3	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
Zoology 10 .....	..	3	Economics 1A-1B	3	3
Mathematics 16A-16B	3	3	†Botany 1	5	..
			Statistics .....	..	3
	16	14		17	15

‡HOME ECONOMICS

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
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 Zoology 10	3	..	Bacteriology 2	4	..
Decorative Art 6A-6B	2	2	Economics 1A-1B	3	3
Psychology 1A .....	..	3	Home Economics 7	3	..
Electives	2	5	Home Economics 6 .....	..	3
			Economics 2 or Psy- chology 5 .....	..	3
	15	16	Elective .....	..	4
				16	16

IRRIGATION SCIENCE

Freshman Year			Sophomore Year		
	Fall Units	Spring Units		Fall Units	Spring Units
Military Science	2	2	Military Science	2	2
Botany 1	5	..	Mathematics 8A-8B	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	..
	15	16	Elective .....	..	3
				15	15

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	2	2
Elective	3	..	Landscape Architecture 1A-1B	3	3
			Landscape Architecture 2	2	..
	16	17	History 17A-17B	3	3
			Electives	3	2
				17	17

* 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.

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

RANGE MANAGEMENT

Freshman Year			Sophomore Year		
Military Science	2	2	Military Science	2	2
Botany 1	5	..	Botany 111	..	4
Chemistry 1A, 8	5	3	|| Economics 1A-1B	3	3
English 1A	..	3	Engineering 1A	3	..
Zoölogy 1A-1B	4	4	English 1B	..	3
Elective	..	3	Geology 1	3	..
	16	15	Physics 2A-2B	3	3
			Elective	3	..
				17	15

SOIL SCIENCE

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

PREVETERINARY SCIENCE

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

Junior and Senior Years

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

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

† See list of restricted electives on page 86.

|| Or Agricultural Economics.

Approval of Study Lists

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

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), foreign language (2 units). German is to be preferred as the foreign language with French second choice. It is strongly recommended that solid geometry ($\frac{1}{2}$ unit) and mechanical drawing (1 unit) be included. Additional foreign language is also desirable. Students with serious deficiencies in this preparation will ordinarily not be allowed to enroll in the College of Chemistry.

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

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

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

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

Honor students in the upper division.—Students who in the first two years of their college work have attained an average of at least two grade points for each unit undertaken will receive honorable mention with junior standing. These students are entitled to register as candidates for honors. After the first semester of the junior year, the Committee on Honors of the College of Chemistry will determine which students shall remain in the honors group and which students shall be promoted thereto. Honor students will be given a larger share of personal instruction and a greater opportunity to choose courses and work within courses, in the manner best suited to individual needs and aims. Stu-

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

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

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

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

<i>Freshman Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Sophomore Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Chemistry 1A-1B	5	5	Mathematics 4A-4B	3	3
Mathematics 3A-3B	3	3	Physics 4B-4C	4	4
¹ German 1-2	4	4	Chemistry 5, 12	3	5
² Engineering 22 (or			Chemistry 110A (or		
³ English 1A)	2 or 3	0	² Engineering 35)		3
Physics 4A		4	³ English 1A (or		
Military Science	2	2	² Engineering 22)	2 or 3	..
⁴ Subject A . . . . .	..	..	Military Science	2	2
	16 or 17	18		14 or 15	17

Upper division.—The student must have completed that portion of the specific requirements (2) to (e) listed above, which are included in the normal curriculum for the first two years, or their equivalent, in order to obtain upper division standing.

Unless a student has a grade-point average of at least 1.5 in these specific lower division courses, he is seldom successful in the upper division. Admission to the upper division with a lower average will be allowed only with the special approval of the Dean, who may require a comprehensive examination.

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

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

² Engineering 22 and 35 are required for chemical engineering students.

³ Speech 1A may be substituted for English 1A.

⁴ For regulations concerning Subject A, see page 35.

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

Major in Basic Chemistry

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

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

Curriculum in Chemical Engineering

This curriculum equips the student for professional work in the development, design, and operation of chemical processes and of process equipment. It includes the subjects common to all engineering curricula, together with thorough fundamental training in chemistry, and specialized advanced courses in chemical engineering. Restricted electives are provided during the senior year to orient each student toward particular types of work and particular industries. Additional training is offered at graduate level, leading to the M.S. 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.

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

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

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

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

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

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

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

COLLEGE OF DENTISTRY

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

Classes are admitted to the College of Dentistry once a year, in September. Applicants for admission in September, 1954, must file their applications between October 1, 1953, and March 1, 1954. Freshman students who plan to apply for admission in 1955 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, 1954.

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

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

Admission to Dental Curricula

All applicants for admission to the dental curricula must have completed at least 60 units of college work with a scholarship average satisfactory to the Admissions Committee, including the requirements (2)-(5) listed below. Students who have attended the University of California must have a C average

or better in work undertaken in the University. In addition, all applicants 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 the spring recess 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 35).
 - Military science and tactics..... 8 units
- (2) English or Speech (1A-1B†)..... 6
- (3) Science28-32
 - (a) Chemistry
 - Inorganic (1A-1B) 10 units
 - Organic lecture (8) 3
 - Organic laboratory (9) or quantitative analysis (5) 3
 - (b) Physics with laboratory (2A-2B and 3A-3B or 4A-4B) 6-8
 - (c) Biology, including one full semester of vertebrate zoölogy, with laboratory (Zoölogy 1A-1B) 6-8
- (4) Trigonometry (Mathematics C) 3 units

It is suggested that this requirement be completed in high school.
- (5) Electives selected as indicated from the following groups:..15-20
 - (a) Group I: 2 year courses selected from Anthropology (2A-2B), Economics (1A-1B), Economic Geography, Geography, History (4A-4B, 8A-8B, 17A-17B), Mathematics (1, 2, 3A-3B, 10, 11A-11B, 12), Political Science (1, 2), Psychology (1A-33), Public Health (5A-5B), Sociology and Social Institutions (1, 2)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),

* The requirement of American History and American Institutions is also prerequisite to the bachelor's degree, page 36.

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

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

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

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

(1) General University requirements:

Subject A (examination in English composition).

American History and American Institutions (required for the bachelor's degree. The examination in American History and American Institutions may be taken in the College of Dentistry, but it is preferable to satisfy the requirement in the pre-dental hygiene program. (See page 36.)

(2) English or speech (1A-1B*) 6 units

(3) Chemistry (1A, 8) 8

(4) Biology (Zoölogy 1A-1B) 6-8

(5) *Either* the Associate in Arts degree from the University of California or the University's degree requirements completed at another accredited university or college, or the following program of courses:

(a) A year course selected from each of the three groups: I, II, and III 18-20 units

Group I: Anthropology (2A-2B), Economics (1A-1B), History (4A-4B, 8A-8B, 17A-17B), Political Science (1, 2), Sociology and Social Institutions (1, 2);

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

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

COLLEGE OF ENGINEERING

Matriculation requirements.—A statement concerning matriculation requirements will be found on page 22. 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. Degree credit in the College of Engineering is not allowed for any course (such as trigonometry) which is equivalent to a matriculation subject listed as prerequisite for a required course in the College of Engineering.

Laboratory courses in the various curricula of the College of Engineering require manual skills in the operation and testing of machines and equipment. These courses are planned on the assumption that the student has had some previous work which will develop the skills. Unsatisfactory laboratory performance frequently results when such skills are absent and this can frequently be traced to the fact that the student has had no prior manual training. It is, therefore, recommended that students wishing to enter the College of Engineering elect shop courses in high school, especially machine shop, for at least one semester.

Advanced standing.—For general information, see page 26.

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 at the regularly scheduled times, otherwise the fee is \$10.

Intercampus transfer.—Students who wish to transfer from other colleges on the campus to the College of Engineering must make application to the Dean of the College of Engineering for such transfer no later than August 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
Applied thermodynamics and fluid mechanics	6
Applied electricity and magnetism	3
Properties of materials	3
Drawing and graphics	4
Engineering design	3
Engineering economics	3
Electives	12

(2) Subjects characteristic of the several curricula. In addition to the subjects and units common to all curricula in engineering, the several curricula include at least the number of units in each of the subjects shown in the following table. Each curriculum requires the total number of units shown at the top of the column, the totals in all cases including the 8 units of military science required of all male undergraduates. Students not required to study military science may substitute other subjects aggregating the same number of units. Credit in physical education may be used for this purpose up to a maximum of four units. The optional subjects noted are to be chosen from sequences of scientific and professional courses giving emphasis to a particular phase of a general field.

	Units		Units
<i>Agricultural Engineering:</i>	134	<i>Electrical Engineering:</i>	132
Mechanics, Thermodynamics, Fluid Mechanics	6	Mathematics	4
Irrigation, Soil Science, Agronomy	13	Mechanics, Thermodynamics, Fluid Mechanics, Strength of Materials ..	6
Agricultural Machinery and Structures	17	Electrical Circuits and Machinery ..	22
Optional Subjects	18	Optional Subjects	20
<i>Civil Engineering:</i>	132	<i>Engineering Physics:</i>	128
Mechanics, Strength of Materials, Properties of Materials, Specifications	9	Chemistry	8
Hydraulic, Water Supply, Sewerage, Foundation, Structural, and Transportation Engineering ..	14	Physics	8
Optional Subjects	24-29	Mathematics	4
		Optional Subjects	20
		Foreign Language	8

	Units		Units
<i>Industrial Engineering:</i>	134	<i>Mining Engineering:</i>	134
Mechanics, Thermodynamics, Fluid		Chemistry	2
Mechanics, Strength of Materials	10	Dynamics	3
Electrical Circuits and Machinery.	5	Mineralogy and Geology.....	18
Business Administration	15	Mining	10
Optional Subjects	24	Metallurgy	5
<i>Mechanical Engineering:</i>	131	Analysis of Ores.....	6
Mechanics, Thermodynamics, Fluid		Optional Subjects	10
Mechanics, Strength of Materials	11	<i>Petroleum Engineering:</i>	134
Mechanical Design and Manufac-		Chemistry	8
turing Processes	10	Mechanics, Thermodynamics, Fluid	
Electrical Circuits and Machinery.	5	Mechanics	6
Optional Subjects	25	Petroleum Technology and	
<i>Metallurgy:</i>	131	Economics	16
Chemistry	8	Optional Subjects	24
Metallurgy	20-24	<i>Process Engineering:</i>	131
Optional Subjects	19-23	Chemistry	13
<i>Mineral Exploration:</i>	136	Unit Operations	18
Chemistry	2	Engineering Design of Processes	
Dynamics	3	and Equipment	6
Mineralogy, Geology, and Paleon-		Optional Subjects	14
tology	34		
Surveying and Map Drawing.....	6		
Optional Subjects	11		

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 38. 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 35.
- (c) American History and American Institutions. See page 36.
- (d) Residence during the senior year. See page 40.
Students in the College of Engineering are required to take the final 32 units of work in residence in the College of Engineering rather than the minimum required by the University.
- (e) Grade points. See page 41.

To be eligible for the bachelor of science degree, a student must have achieved at least a C average in all courses of upper division level offered in satisfaction of subject requirements and restricted electives of the student's curriculum and option.

(2) Satisfactorily complete one of the engineering curricula. A student who gives full time to University responsibilities may enroll without special permission for the number of units required in his program of study (see pages 99-108). 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 counselor in order to avoid delay caused by the lack of prerequisites.

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

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

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

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

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

Students in agricultural, civil, industrial, mechanical, mining, petroleum, and process engineering, 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 taken in residence at the University in place of the same number of elective units.

Pass or Fail Grades: Subject to the approval of the Committee on Study Lists, students may choose elective courses from any department of the University. Students who have an average grade of B or better for all work undertaken in the University shall have (subject to the approval of the instructor concerned) the privilege of taking each semester one elective course in which they shall be marked "passed" or "not passed." In calculating grade-point standing, units gained in this way shall not be counted.

PROGRAM OF STUDY IN AGRICULTURAL ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 8.
4. Engineering 1A, 22, 23, 24, 35, 40, 41, 48 (recommended).
5. Civil Engineering 108A, 108F.
6. Electrical Engineering 100A, 100B, 104A, 104B.
7. Mechanical Engineering 105A, 105B, 103, 151 (or Physics 112), 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 140.
11. Irrigation 120.
12. Soil Science 106.
13. Agronomy 1.

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

Second Year (Davis or Berkeley campus).—Mathematics 4A, 4B, Physics 4B, 4C, Engineering 24, 35, 40, 41, Agricultural Engineering 12*, electives, 3 units.

Third Year (Berkeley campus).—Mechanical Engineering 105A, 105B, Engineering Design 102B, 106 (or Civil Engineering 107A), Civil Engineering 108A, 108F, Electrical Engineering 100A, 100B, 104A, 104B, Mechanical Engineering 103, Agricultural Economics 140, electives, 3 or 4 units.

Fourth Year (Davis campus).—Agricultural Engineering 113, 114, 115, 130, Mechanical Engineering 151 (or Physics 112), Mechanical Engineering 152A (or Chemistry 109), Irrigation 120, Soil Science 106, Agronomy 1, electives, 3 units, technical electives, 3 units.†

Summer Course: Agricultural Engineering 49, summer course given at Davis, 6 units. May be taken after the sophomore year.

Electives: For selection of electives, see page 99.

PROGRAM OF STUDY IN CIVIL ENGINEERING

Specific Course Requirements for the B.S. Degree (all options):

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B.
4. Engineering 1A, 1B, 8, 22, 23, 35.
5. Geology 1.
6. Engineering Design 102B.
7. Civil Engineering 106, 107A, 108A, 108C, 108E, 109A, 111A, 113, 116, 133, 135, 161.
8. Mechanical Engineering 103, 105A.
9. Electrical Engineering 101.

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

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

Third Year.—Engineering Design 102B, Civil Engineering 107A, 108A, 108C, 108E, 135, 161, Mechanical Engineering 103. (Students in sanitary and municipal options take Civil Engineering 161 in senior year and Civil Engineering 111A in junior year.)

Fourth Year.—Civil Engineering 106, 109A, 111A, 113, 116, Electrical Engineering 101.

Students are required to select one of the options listed below. Courses indicated are required for completion of the option.

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

† Recommended technical electives: Agricultural Engineering 199, 106, Pomology 12, Vegetable Crops 1, Veterinary Science 111, 3, Animal Husbandry 101, 110, Bacteriology 2, Botany 1, 107, Chemistry 101, 109, English 106L, Irrigation 125, 130, 160, Mathematics 110A–110B, 119A–119B, 130A–130B, Zoology 10, Dairy Industry 1, Soil Science 110.

Construction:

Third Year: Business Administration 1A, 1B, 150, 151, Civil Engineering 133.

Fourth Year: Engineering 120, Civil Engineering 181, Business Administration 122, Mechanical Engineering 105A, electives, 8 units.

Hydraulics:

Third Year: Mechanical Engineering 105A, Civil Engineering 133, 3 units of electives, 6 units of restricted electives.

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

Restricted electives are to be chosen from the following: Irrigation 102A, 102B, 104, 112; Civil Engineering 166; Engineering 120, 197; Mechanical Engineering 161, 162; Mathematics 110A-110B.

Irrigation:

Third Year: Civil Engineering 102A, 133, Irrigation 102A, 103, Mechanical Engineering 105A, electives, 2 units.

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

Sanitary and Municipal:

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

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

Students interested in public health should elect at least 5 units from the following: Public Health 113B, 145, 162, 170, 171; Chemistry 8, 109; Civil Engineering 126, 147, 148, 198, 199; Physiology 107; Political Science 181; Physics 125, 126; Soil Science 111; Engineering 120; Biochemistry 102. Students interested in municipal engineering should elect at least 5 units from the following: Political Science 162, 181; Civil Engineering 102A, 147, 148, 171, 198 or 199; City Planning 121; Engineering 120; Architecture 117; Landscape Architecture 116; Soil Science 111; Biochemistry 102; Irrigation 112.

Structural:

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

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

Transportation:

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

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

Electives: For selection of electives, see page 99.

PROGRAM OF STUDY IN ELECTRICAL ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3, 4A, 4B, 110.
2. Chemistry 1A, 8 or 1B.
3. Physics 4A, 4B, 4C.
4. Engineering 22, 23, 35, 42, 113, 120.
5. Electrical Engineering 104A, 104B, 105, 106, 110A, 110B, 111A, 116A, 132A, 133A.
6. Mechanical Engineering 105A, 107, 109.
7. Engineering Design 102B.
8. Civil Engineering 108A, 108F.

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

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

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

Third Year.—Electrical Engineering 110A, 110B, 104A, 104B, 105, 106, Mechanical Engineering 105A, 107, 109, Engineering Design 102B, Civil Engineering 108A, 108F, electives, 3 units.

Fourth Year.—Electrical Engineering 111A, 116A, 132A, 133A, Engineering 113, 120, 3 units of 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: Mechanical Engineering 143, 146, Business Administration 100, 142, 150, 140.

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

Digital Computer: Electrical Engineering 121, 151A, 151B, 152A, 152B, 153A, 153B, Engineering Design 180. Mathematics 119A, 119B, 128 recommended.

Illumination: Electrical Engineering 140, 141, 142, Physics 108A (or 108B), and two additional restricted electives.

Industrial Electronics and Control Systems: Electrical Engineering 126, 127, 135, and a choice from the following: Electrical Engineering 111B, 118A, 118B, 123B, Mathematics 119A, 119B, Mechanical Engineering 143, 164.

Physics: Electrical Engineering 117A, 117B, Physics 115, 121, and a choice from the following: Physics 108B, 124, 129A, 129B, 130.

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

Electives: In addition to completing the requirements noted above, 15 units of electives must be included in the program. See page 99 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 electives. Four units of the foreign language can be applied in partial satisfaction of the required twelve units of sociohumanistic electives.

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

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

Third Year.—Physics 105A, 105B, 121, 110A, 110B, 112, Mechanical Engineering 103, restricted electives (may be junior courses), 9 units.

Fourth Year.—Physics 108B, Mechanical Engineering 164, Engineering 120, Civil Engineering 108A, restricted electives, 11 units (must be senior-level courses), electives (non-engineering), 6 units*, electives (free), 3 units. Restricted electives are to be chosen with the approval of the study-list 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.

Electives: For selection of electives, see page 99.

PROGRAM OF STUDY IN INDUSTRIAL ENGINEERING

(Students ordinarily are not allowed to transfer to the industrial engineering program after the beginning of the junior year.)

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B, 130E.
2. Chemistry 1A, 8.
3. Physics 4A, 4B, 4C.
4. Engineering 1A, 22, 23, 24, 35, 40, 41, 48†, 113, 120.
5. Business Administration 1A, 1B, 100, 140.
6. Civil Engineering 108A, 108F.
7. Electrical Engineering 100A, 100B, 104A, 104B.
8. Engineering Design 102B, 106.
9. Mechanical Engineering 103, 105A, 105B, 107, 143, 145, 146, 147.

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

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

Third Year.—Civil Engineering 108A, 108F, Electrical Engineering 100A, 100B, 104A, 104B, Engineering Design 102B, 106, Mechanical Engineering 103, 105A, 105B, Business Administration 1A, 1B.

Fourth Year.—Mechanical Engineering 107, 143, 145, 146, 147, Engineering 113, 120, Business Administration 100, 140, Mathematics 130E, electives, 6 units.

Electives: For selection of electives, see page 99.

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.

* Any engineering or non-engineering elective.

† Not required for transfer students with advanced standing if the credit includes at least 20 units or more of the courses prescribed in the freshman year. Technical units must be substituted for this course.

7. Engineering Design 102B, 106.

8. Mechanical Engineering 103, 105A, 105B, 124A, 124B, 131A, 131B.

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

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

Third Year.—Engineering Design 102B, 106, Mechanical Engineering 103, 105A, 105B, Electrical Engineering 100A, 100B, 104A, 104B, Civil Engineering 108A, 108F, electives, 6 units.

Fourth Year.—Engineering 113, 120, Mechanical Engineering 124A, 124B, 131A, 131B, and 12 units of restricted electives. Senior students will select a logical sequence of restricted electives* approved by the adviser. Of the 12 units of restricted electives to be taken at the University of California, 5 units must be senior mechanical engineering or engineering design courses taken at Berkeley. The following list of options will aid the student in selecting restricted electives appropriate to his chosen field of study.

Aeronautics Option: Mechanical Engineering 121, 162, Mathematics 110A, 110B, Civil Engineering 107G, Engineering Design 170, Mechanical Engineering 123A, 123B, 123C, 161, 164.

Air Conditioning and Refrigeration Option: Mechanical Engineering 115, 116 or 117, 161, 151, Metallurgy 170A, Mechanical Engineering 154, Chemistry 110A, 110B, or 109.

Automotive Control Option: Mechanical Engineering 151, 161, 164, Electrical Engineering 121, 127, 135, Engineering Design 170, 180, Mathematics 110A, 110B, 185.

Automotive Option: Mechanical Engineering 123A, 123B, 123C, Metallurgy 170A, Mechanical Engineering 151, 161, Engineering Design 170, 172, 173, Chemistry 109.

Fluid Mechanics Option: Mechanical Engineering 161, Mathematics 110A, 110B, Mechanical Engineering 162, 151, Engineering Design 170, Mechanical Engineering 164, Irrigation 102A, 102B, Civil Engineering 166.

Heat Power Option: Mechanical Engineering 118, 123A, 123B, 123C, 117, 151, 154, 161, Petroleum Engineering 117, 119, Metallurgy 170A, Chemistry 109.

Heat Transfer and Thermodynamics Option: Mechanical Engineering 151, 161, 152, 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.

Naval Architecture and Marine Engineering Option: Mechanical Engineering 128A, 128B, 126, 123A, 123B, 123C, 161, 117, Engineering Design 170.

Mechanical Design Option: Engineering Design 102C, 170, 171, 172, 111, 173, Mechanical Engineering 145, Mathematics 110A, 110B, Mechanical Engineering 164, Electrical Engineering 126, Metallurgy 170A.

Nuclear Engineering Option: Mathematics 110A, 110B, Mechanical Engineering 151, 198 (Nuclear engineering section), Physics 121, 124, Mechanical Engineering 162, 164, Electrical Engineering 103A, 103B, Metallurgy 150A, Chemistry 123, Engineering Design 171.

Process Engineering Option: Mechanical Engineering 152, 154, 161, 163, 151, 164, 180, Chemistry 109, Chemical Engineering 144.

* Restricted electives are upper division courses, normally offered by the departments of Engineering, Chemistry and Chemical Engineering, Mathematics, Physics, and Business Administration.

Preparation for Graduate Study Option: Mathematics 110A, 110B or 119A, 119B, Mechanical Engineering 151, 161, 162, Engineering Design 102C, 170, 172, Mechanical Engineering 154, Physics 104.

Electives: For selection of electives, see page 99.

PROGRAM OF STUDY IN METALLURGY

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B.
2. Physics 4A, 4B, 4C.
3. Chemistry 1A, 1B, 110A, 110B.
4. Engineering 22, 23, 35 (or Physics 105A), 120.
5. Metallurgy 2A, 100A, 100B, 150A, 150B.
6. Mineralogy 6.
7. Civil Engineering 108A.
8. Mechanical Engineering 103 (or Chemical Engineering 146A).
9. Electrical Engineering 101, 102.

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

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Metallurgy 2A, Mineralogy 6, Chemistry 110A, Engineering 35 (or Physics 105A).

Third Year.—Chemistry 110B, Civil Engineering 108A, Metallurgy 100A, 100B, 150A, 150B, Mechanical Engineering 103 (or Chemical Engineering 146A).

Fourth Year.—Electrical Engineering 101, 102, Engineering 120.

Students are required to elect an option in either Extractive Metallurgy or Physical Metallurgy. Courses indicated below are required for completion of the option:

Extractive Metallurgy:

Second Year: Metallurgy 2B.

Third Year: Metallurgy 108, 110A, electives, 6 units, restricted electives, 2 units.

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

Physical Metallurgy:

Second Year: electives, 2 units.

Third Year: Civil Engineering 108F, Engineering Design 102B, Engineering 41, electives, 5 units.

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

Electives: For selection of electives, see page 99.

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, 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, electives, 3 units.

Fourth Year.—Engineering Design 102B, Geology 116, Mechanical Engineering 103, Chemistry 109, Civil Engineering 108A, Mining 111A, 111B, 107A, 107B, electives, 8 units.

Electives: For selection of electives, see page 99.

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, electives, 6 units.

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

Electives: For selection of electives, see page 99.

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, electives, 6 units.

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

Fourth Year.—Mechanical Engineering 105B, Petroleum Engineering 121A, 121B, 123A, 123B, 125, 127, restricted electives, 13 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.

Electives: For selection of electives, see page 99.

PROGRAM OF STUDY IN PROCESS ENGINEERING

Specific Course Requirements for the B.S. Degree:

1. Mathematics 3A, 3B, 4A, 4B, 110B.
2. Chemistry 1A, 1B, 12, 110A, 110B.
3. Engineering 22, 23, 35, 40, 48*, 120.
4. Physics 4A, 4B, 4C.
5. Civil Engineering 108A.
6. Mechanical Engineering 103, 105A, 132, 151, 152, 154, 180.
7. Electrical Engineering 101, 102.
8. Engineering Design 102B.
9. Chemical Engineering 143, 145A, 146B.

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

Second Year.—Mathematics 4A, 4B, Physics 4B, 4C, Chemistry 12, Engineering 35, 40, electives, 3 units.

Third Year.—Civil Engineering 108A, Chemistry 110A, 110B, Chemical Engineering 143, Mechanical Engineering 103, 105A, Electrical Engineering 101, 102, Engineering Design 102B, Mathematics 110B, electives, 6 units.

Fourth Year.—Mechanical Engineering 132, 151, 152, 154, 180, Engineering 120, Chemical Engineering 145A, 146B, restricted electives, three units of which must be design, approved by the adviser, 8 units.

Electives: For selection of electives, see page 99.

Ceramic Engineering

Instruction in ceramic engineering, a study of the making and properties of non-metallic and inorganic products that require high temperature treatment at some stage in their production, is offered in the Colleges of Engineering. The courses at Berkeley are given under the Division of Mineral Technology. Students interested in education in Ceramic Engineering are advised to obtain first a B.S. degree with a major in Metallurgy, Process Engineering or Chemical Engineering, including the available undergraduate courses in Ceramic Engineering. An additional year of study will then lead to an M.S. degree or Master of Engineering degree in Ceramic Engineering.

The research program at Berkeley emphasizes the exploitation and technology of California raw materials and study of ceramic composition, while that at Los Angeles is directed toward the problems encountered in ceramic manufacturing.

* Not required for transfer students with advanced standing if the credit includes at least 20 units or more of the courses prescribed in the freshman year. Technical units must be substituted for this course.

A preliminary survey of the present industry in the State indicates need for a number of outstanding undergraduates 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 railroad engineering. 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

Currently, the College of Pharmacy offers two four-year curricula, each of which leads to the degree Bachelor of Science in Pharmacy, and a fifth year of study which, for properly qualified students, leads to the degree Master of Pharmacy.

The four-year curriculum which has been in existence since 1933 is available only to students who will have completed the first year of the Old Curriculum

in the College of Pharmacy (see below) before September, 1953. The Old Curriculum will be available for the last time to students entering the second year in pharmacy (San Francisco campus) in September, 1953. After September, 1953, students will be accepted as regular second-year students in pharmacy (San Francisco campus) only after completion of the pre-professional and first-year requirements of the new four-year curriculum.

Details of these curricula are given in the ANNOUNCEMENT OF THE COLLEGE OF PHARMACY which may be obtained from the Office of the Dean, College of Pharmacy, University of California Medical Center, San Francisco 22, California.

In addition to the above curricula, graduate courses leading to the degrees Master of Science and Doctor of Philosophy in Pharmaceutical Chemistry are open to qualified students. These programs are under the jurisdiction of the Graduate Division of the University. For details concerning them, consult the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the Graduate Division bulletin entitled ANNOUNCEMENT IN THE BIOLOGICAL SCIENCES, both of which may be obtained from the Graduate Division, University of California, Berkeley 4, California.

Requirements for Admission.—To be admitted to the College of Pharmacy, students must be eligible for admission to the academic colleges of the University (see pages 22–32) and, to be eligible for the new curriculum, must have completed, with an average grade of C or better in the University of California or in another institution of approved standing, at least 30 units of the program set forth below under the heading "Prepharmacy." If the work is not taken at the University of California, the courses selected must be courses that parallel similar courses taught at the University of California. Students who have completed the First Year of the Old Curriculum (see below) in any accredited institution may apply for admission to the Second Year of the Old Curriculum on the San Francisco campus. This option will not be available after September, 1953. In order to complete the Prepharmacy studies in the minimum time, it is recommended that students complete a full year of intermediate algebra, trigonometry, and elementary chemistry in the high school.

Students who have completed the Prepharmacy studies and the requirements of the First Year of pharmacy cannot be assured of admission to the Second Year of the pharmacy curricula on the Medical Center campus. When the number of qualified applicants for the Second Year of the curricula exceeds the available facilities, selection will be made on the basis of scholarship as determined from the college 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 Office of Director of Admissions, University of California Medical Center, San Francisco 22, California. *Application for admission to the College of Pharmacy, University of California Medical Center campus, San Francisco, must be filed between October 1 and April 1 preceding the September of proposed admission.*

Advisers to the first-year students, College of Pharmacy at Berkeley, Mr. J. J. Eiler and Mr. D. C. Brodie, hold office hours at Berkeley during registration periods. (See the CIRCULAR FOR NEW UNDERGRADUATES concerning time and place.) At other times, Mr. Clinton C. Conrad, Assistant Dean of Students, Office of the Dean of Students, 201 Administration Building, is adviser to the prepharmacy first-year students on the Berkeley campus. Applications for admission, late registration, and all student petitions may be submitted to him for approval.

The adviser to the first-year students, College of Pharmacy at Los Angeles, Mr. O. A. Plunkett, may be contacted at his office in the Physics-Biology Building on the Los Angeles campus.

Residence requirement.—To qualify for the California State Board of Phar-

macy examination, a student must have spent four years in residence in an accredited school or college of pharmacy.

Students who elect to complete the First Year of the New Curriculum, together with the preprofessional year, at a junior college, state college, or other approved collegiate institution, may offer the Fifth Year of the curriculum on the San Francisco campus to satisfy the four-year residence requirement. Such students, providing they satisfy the minimum scholastic requirements, will receive both the degree Bachelor of Science in Pharmacy and the degree Master of Pharmacy upon completion of the Fifth Year. Those not satisfying the minimum scholastic requirements for the Master of Pharmacy degree will receive the degree of Bachelor of Science in Pharmacy and a Certificate of Completion (of the Fifth Year).

Students who register for the First Year of the New Curriculum in the College of Pharmacy on either the Berkeley or the Los Angeles campus of the University will automatically complete their residence requirement at the end of the fourth year (third year on the San Francisco campus). At this time they may be awarded the degree Bachelor of Science in Pharmacy if they have completed all other requirements. Registration in other colleges or departments on these campuses will *not* satisfy any part of the residence requirement, nor may the preprofessional year of study be counted toward the residence requirement.

Graduation.—Candidates for the degree of Bachelor of Science in Pharmacy must have completed at least four years of residence in an accredited college of pharmacy and must have completed the curriculum of the College of Pharmacy, University of California, including at least 129 units of work, with an average grade of C or better. It should be emphasized that the four-year residence requirement can be met in the minimum time only by taking the studies of the first year in residence in the College of Pharmacy on either the Berkeley or the Los Angeles campus of the University.

NEW CURRICULUM

<i>Prepharmacy</i>	<i>First Year</i>		<i>First Year</i>	
	<i>Fall</i> Units	<i>Spring</i> Units	<i>(College of Pharmacy)</i>	
		<i>Fall</i> Units	<i>Spring</i> Units	
Chemistry 1A-1B	5	5	Zoölogy 1A-1B	4
¹ Elective	3	..	Physics 2A-2B	3
Botany 12 . . . . .	..	4	Physics 3A-3B	1
English 1A-1B or			Mathematics 3A-3B	3
Speech 1A-1B	3	3	² History 17A-17B	3
² Elective	3-4	3-4	Military Science	2
Military Science	2	2		
	16-17	17-18	16	16

¹ Trigonometry and Intermediate Algebra are prerequisite to Mathematics 3A.

² A year course chosen from foreign language, mathematics, social science, philosophy, or the fine arts and selected from the courses offered in satisfaction of the (e) requirement in the College of Letters and Science (see page 61).

³ If this requirement is satisfied by examination, electives may be taken.

*FIRST YEAR—OLD CURRICULUM

	First Semester Units	Second Semester Units
Zoölogy 1A-1B	4	4
^a Botany 12 (or equivalent)	4	4
Chemistry 1A-1B (General Chemistry)...	5	5
English 1A-1B (First-year Reading and Composition) or Speech 1A-1B (Ele- ments of Speech)	3	3
^c Mathematics	3	..
Military Science	2	2
^d Subject A (English Composition).....	..	..
Total.....	17	18

Master of Pharmacy

Qualified students who have received the degree of Bachelor of Science in Pharmacy, or who have completed all requirements for that degree except the residence requirement, may undertake the studies of the Fifth Year leading to the master's degree. Students completing the program of the Fifth Year with an average grade of B or better will be awarded the degree of Master of Pharmacy.

Provision is made for students who elect to take the Prepharmacy Year and the first year of the pharmacy curriculum at an approved institution (junior college, state college, etc.) other than a college of pharmacy. Such students can satisfy both the curricular requirements and the residence requirement by completing the work of the Fifth Year. Qualified students taking the Fifth Year of the professional program in satisfaction of the residence requirement for the bachelor's degree may be awarded the degree of Master of Pharmacy together with the degree of Bachelor of Science in Pharmacy upon completion of these studies with an average grade of B or better. Students who do not achieve a B average for the work of the fifth year will receive a bachelor's degree and a certificate of completion of the Fifth Year.

⁴ For details of the courses prescribed during the first year, consult the ANNOUNCEMENT OF COURSES.

⁵ Botany 1 may be substituted for Botany 12.

⁶ Students should have completed two years of algebra and one-half year of trigonometry in the high school. If these requirements have not been satisfied, equivalent courses (Mathematics C, Mathematics D) must be taken. Students who have satisfied the high school requirements may take one of the following courses: Mathematics 1 or 5A, 2 or 11A.

⁷ See page 35 for Subject A requirement.

SCHOOL OF ARCHITECTURE

All entering freshmen should consult the SUPPLEMENTARY ANNOUNCEMENTS TO THE ANNOUNCEMENT OF COURSES, 1953-1954, for possible changes in the degree requirements in the School of Architecture.

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

Freshmen who plan to enter the School later should, upon entering the University, register in the College of Letters and Science (Prearchitecture) where they will normally remain for two years. Successful completion of the 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, descriptive geometry, water color, pen and ink and pencil drawing, and history of architecture courses offered by the School must present a comprehensive, well organized exhibit of their work for evaluation by the faculty during registration week.

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

<i>Freshman Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Sophomore Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Subject A (see page 35) . . . .		..	Military Science	2	2
American History and American Institutions (see page 36) . . . . .		..	Engineering 18A-18B	3	3
Military Science	2	2	Architecture 5A-5B, 6A-6B	3	3
⁵ Mathematics 3A-3B	3	3	Architecture 3-4	3	4
⁵ Physics 2A-2B	3	3	Architecture 12	1	..
⁵ Physics 3A-3B	1	1	⁵ Foreign Language	4	4
⁵ Year Course	3	3			
Architecture 1-2	3	3			
Architecture 18 . . . . .	..	1			
Art 2A	2	..			
Engineering 21 . . . . .	..	3			
	17	19		16	16

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), (e), and (d) of the College of Letters and Science, pages 60-61).

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.

³ See requirements (b), page 60, 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 60, College of Letters and Science.

⁵ See requirement (e), page 61, College of Letters and Science.

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.

PRESCRIBED CURRICULUM

<i>Junior Year</i>	<i>Fall Units</i>	<i>Spring Unit</i>	<i>Senior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Civil Engineering 112		2	Civil Eng. 107E-107F	3	3
Architecture 101A-101B	5	5	Civil Engineering 108F		1
Architecture 5C-5D	2	2	Architecture 102A-102B	5	5
Architecture 6C-6D	1	1	Architecture 108A-108B	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 the ANNOUNCEMENT OF COURSES, DEPARTMENTS AT BERKELEY.

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. Evidence of superior scholarship and an acceptable bachelor's degree are required for admission to the School of Business Administration in graduate standing.

Preparation.—An organized program of work fulfilling the requirements for admission to junior standing in any of the colleges of the University will provide sound preparation for work in the School. Most students meet the requirements of the College of Letters and Science, thus building a broad general foundation. Students may, however, if they prefer, elect to take their lower division work in the technical colleges. For instance, those looking forward to employment in the agricultural industries or in business based closely upon these industries, might well take their lower division work in the College of Agriculture. Likewise, those wishing to work in the technical aspects of manufacturing or in industrial management could profitably spend their first two years in the College of Engineering. In general, students should choose that lower division preparation which is most closely related to the particular field and division of business administration they wish to enter.

Students entering the School of Business Administration through the College of Letters and Science may offer, in place of the full language requirement for the Associate in Arts degree, twelve units of not more than two languages and English 1A or Speech 1A; or eight units of one language and English 1A-1B or Speech 1A-1B or a combination of English 1A and Speech 1A. Students using this plan may not offer the English or Speech courses used in substitution for the foreign language in partial satisfaction of the group (e) requirement for the degree of Associate in Arts. Such students should note that they are not meeting requirements for the degree of Associate in Arts as set forth by the College of Letters and Science (see page 61).

It is highly desirable for candidates for admission to the School to complete the lower division prerequisites prior to entrance (see below). In addition to the minimum specific requirements, introductory work in economic geography and economic history is highly recommended. Students wishing to take advanced work in mathematics may elect Mathematics 3A-3B, or Mathematics 16A-16B, Analytic Geometry and Calculus, instead of Mathematics 2, Mathematics of Finance and Business. Normally, however, students will take Mathematics 2, Mathematics of Finance and Business, which provides the minimum essentials for the courses in accounting, corporation finance, investments, and business administration in general.

The Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science are intended to provide for all students not only a broad knowledge of the background and chief functions of modern business enterprise, but also elementary training in the use of the professional tools of accounting, statistics, and economic analysis. Since many students are unable to decide upon the specific field or position for which they wish to train, and since some shift into positions other than those anticipated, it is highly important that all have the common basis of fundamental training. On this foundation they can readily build for specific types of needs. But students are normally expected to begin to specialize by electing a field

of emphasis of 9 units beyond the introductory course in one field (see below). Under the advisory procedure of the School, fields of emphasis may be approved in departments other than those listed below if the total program of the student is soundly conceived in terms of his future interests and needs. It is hoped that some students will wish to propose programs integrating work in other fields of training, such as agricultural economics, public administration, and mechanical engineering (see below).

In order to qualify for the degree of Bachelor of Science in the School, the student must have received 120 units of credit with at least a C average. All candidates for the degree of Bachelor of Science entering the School of Business Administration after attendance at other colleges or schools of this University or other institutions, with senior standing at the time of admission, are required to have been enrolled during the senior or final year in resident courses of instruction in the School of Business Administration (Berkeley). At least 24 units (12 units each semester) must be completed in this period. It is permissible to offer 12 units completed in two summer sessions of the same year as equivalent to one semester; but the student must complete in resident instruction at least one regular semester of his senior year. The candidate shall have maintained at least a C average in basic upper division courses in business administration and economics taken in residence at the University of California, and at least a C average in all courses offered in the field of emphasis taken in residence at the University of California, in satisfaction of the requirements for the degree of Bachelor of Science in business administration.

Below are listed the specific requirements for the degree of Bachelor of Science. For further information see the ANNOUNCEMENT OF THE SCHOOL OF BUSINESS ADMINISTRATION.

I. Prerequisite Courses:

A. Required:

Economics 1A-1B (Elements of Economics)	6 units
Economics 2 (Economic Statistics)	3
Mathematics 2 (Mathematics of Finance and Business) (See page 114 for possible substitutions)	3

B. Recommended:

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

II. Basic Courses:

A. Required of all:

American History and American Institutions	0
Business Administration 1A-1B (Principles of Accounting)	6
Business Administration 18 (Business Law)	3
Business Administration 100 (Economics of Enterprise)	3
Business Administration 101 (Business Fluctuations and Forecasting)	3
Business Administration 105 (Law of Business Organi- zation and Regulation) or 109 (Law of Finance)	3
Business Administration 131 (Corporation Finance)	3
Business Administration 140 (Production Organization and Management)	3
Business Administration 150 (Industrial Relations)	3
Business Administration 160 (Marketing)	3

30 units

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

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

III. Field of Emphasis:

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

The following fields of concentration are approved: accounting, banking and finance, business statistics, foreign trade, industrial management, insurance, marketing (including retailing, wholesaling, sales management, industrial purchasing, advertising, and cooperative marketing), industrial relations and personnel management, real estate and urban land economics, transportation and traffic management, and public utilities.

Students who do not wish to elect one of the above fields of concentration may receive permission to (1) fulfill the requirements of the major in the Department of Economics, (2) elect special programs with the permission of the Dean (such programs may be in other fields, for example: agricultural economics, civil engineering, electrical engineering, forestry, geography, journalism, mathematics, mechanical engineering, political science, psychology, and public administration).

It will be noted that the courses listed above under II and III total 42 units. In cases where some requirements are fulfilled by two-unit courses (e.g., by summer session courses), thus reducing the total number of units in the basic courses and field of emphasis, additional upper division courses must be completed in Business Administration or Economics or, with the permission of the Dean of the School, in closely related subjects, to raise the total to at least 41 units.

Honors

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

The Degree of Master of Business Administration

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

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

SCHOOL OF CRIMINOLOGY

The School of Criminology, replacing the group major in criminology in the College of Letters and Science on July 1, 1950, offers undergraduate and graduate curricula leading to the degrees of Bachelor of Arts, Bachelor of Science, and Master of Criminology.

Admission.—To be admitted to the School, students must have attained upper division standing and at least a grade C average in the College of Letters and Science or the equivalent elsewhere. Evidence of superior scholarship and

an acceptable bachelor's degree are required for admission to the School of Criminology in graduate standing.

Preparation.—In addition to fulfilling the lower division requirements of the College of Letters and Science (see pages 60–62), students must complete certain designated prerequisite courses. Some of these courses, listed below under I. *Prerequisite Courses*, are marked by asterisks indicating their acceptance in fulfillment of some of the lower division requirements. Although it is desirable that the prerequisite courses be completed prior to entrance to the School, they may be completed in the upper division.

Requirements for the Bachelor's Degree

The bachelor's degrees in the School of Criminology are granted upon the following conditions:

1. The student must have completed the requirements for the degree of Associate in Arts except that 8 units of one modern foreign language will meet the foreign language requirement and criminalistics majors may substitute an additional sequence of 5 or 6 units of natural sciences, in excess of other natural science requirements, for one of the groups listed as (e), (4), (5), or (6).

2. The student must have received at least 120 units of credit with at least a C average. With the exception of transfer students, at least 54 units must have been completed after entrance to the School. No credit will be allowed toward the bachelor's degree for work completed at a junior college after the student has completed 66 units toward the degree. The student must have maintained at least a C average in the basic upper division courses and in the courses required for his major.

3. Students with senior standing at the time of admission to the School are required to have been enrolled during the senior or final year in resident courses of instruction in the School. At least 24 units, including at least 18 units in upper division courses with 12 units of criminology courses, must be completed in this period. It is permissible to offer two summer sessions as equivalent to one semester; but in any event, the student must complete in resident instruction at least one regular semester of his senior year.

4. The completion of the course of study outlined below.

The requirements for the bachelor's degrees in the School of Criminology are intended to provide all students with a broad knowledge of the causes, prevention, and treatment of criminality. Special attention is given to the common problems that arise from criminal activities and the devices used by modern society in coping with them.

Three distinct fields of study are provided. Two of them deal with the application of the social sciences to (a) law enforcement, and (b) correctional work. They lead to the degree of Bachelor of Arts. The third is concerned primarily with the application of the natural sciences to law enforcement and crime investigation and leads to the degree of Bachelor of Science. Completeness of training in either field requires a combination of social and natural sciences with emphasis on one or the other.

All students in law enforcement and correctional work are required to complete the basic courses listed below. These courses provide a common basis of fundamental training on which the students may build to meet their specific interests and needs. At the time of entrance, students are expected to elect as their major field of interest either law enforcement, correctional work, or criminalistics. The first two give emphasis to the social sciences, the last to the natural sciences.

Below are listed the specific requirements for the bachelor's degrees. For further information see the ANNOUNCEMENT OF THE SCHOOL OF CRIMINOLOGY.

I. PREREQUISITE COURSES

Units

For all criminology students: American History and American Institutions; Mathematics 12* or Psychology 5 or Economics 2; Psychology 1*; Psychology 1A* 9 plus

For students majoring in law enforcement or correctional work: Sociology 1*-2*; Political Science 1*-2*; Psychology 3 or 33 .. 15
Students interested in law enforcement are urged to take a year of wrestling and a year of boxing.

For students majoring in criminalistics:

Chemistry 1A*-1B*, 5*, 12A-12C; Physics 2A*-2B*, 3A*-3B*;
Physiology 1L* 29

II. BASIC COURSES (required of all students in Law Enforcement and Correctional Work)

†Criminology 100A-100B (Crime Causation, Prevention, and Correction)	6
Criminology 101 (Crime Investigation)	2
†Criminology 103 (Psychological Aspects of Criminology)	3
†Criminology 105A-105B (Police Administration)	6
Criminology 115A-115B (Legal Relations in Criminology)	6

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

Law Enforcement: Adviser: Mr. Kelley.

Criminology 107 (Personal Identification)	3
Criminology 111 (Physical Evidence)	2
Criminology 113 (Legal Medicine)	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, 140, 150, 151, 152, 191; Economics 104, 113, 142, 150, 180; Mathematics 120A-120B; Physiology 104; Political Science 100A, 102A, 105A, 111A, 113, 157A-157B, 160A-160B, 181, 183, 184; Psychology 102A-102B, 104, 112, 120, 145, 146A-146B, 148A-148B, 180, 186; Public Health 186; Speech 107A-107B, 110A-110B; Social Welfare 100, 110A-110B; Zoölogy 115; and for seniors who have met the requirements for admission to graduate courses, Criminology 291A-291B, 292, 293A-293B, 296A-296B; Political Science 261A-261B, 273, 281A-281B; Social Welfare 201, 257A-257B, 262.

Correctional Work: Adviser: Mr. MacCormick.

Criminology 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
Criminology 184 (Noninstitutional Treatment of the Criminal and Delinquent)	2

* Will be accepted in partial fulfillment of requirement (e), College of Letters and Science (see page 61).

† Courses that should be taken in the junior year to avoid conflict in senior year.

	Units
Social Welfare 100 (The Field of Social Welfare).....	3
Electives	9
Agricultural Economics 112A-112B; Anthropology 118A-118B; Business Administration 140; Economics 106A-106B, 113; Education 160, 164, 181; Home Economics 121, 142; Philosophy 108; Physical Education 131A-131B; Political Science 105A, 160A-160B, 103A, 102A, 181, 183; Psychology 112, 141, 145, 165, 185; Public Health 5A-5B, 100A, 106, 110, 135; Sociology and Social Institutions 101A-101B, 110, 130, 160; Social Welfare 106, 108; and for seniors who have met the requirements for admission to graduate courses, Political Science 261A-261B, Social Welfare 257A-257B, 262.	
<i>Criminalistics: Adviser: Mr. Kirk.</i>	
Criminology 100A (Crime Causation, Prevention, and Correction) .	3
Criminology 101 (Crime Investigation).....	2
Criminology 103 (Psychological Aspects of Criminology).....	3
Criminology 105B (Police Administration)	3
Criminology 107 (Personal Identification).....	3
Criminology 111 (Physical Evidence).....	2
Criminology 113 (Legal Medicine).....	3
Criminology 115A-115B (Legal Relations Involved in Criminology)	6
Criminology 151 (Microchemical Testing of Physical Evidence) ..	5
Criminology 153 (Advanced Techniques in Evidence Examination) ..	3
Criminology 155 (Comparative Microscopy)	3
Biochemistry 102 (A Brief Survey of the Principles of Biochemistry)	3
Forestry 114 (Wood Technology).....	3
Public Health 172 (Industrial Toxicology).....	2
Zoölogy 119A-119B (Optics and Metrology in Biology).....	4
Recommended: Anthropology 150A-150B; Biochemistry 101A-101B, 107; Botany 108; Chemistry 100, 105, 109, 125; 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: Counselor: Mr. Kelley.

	<i>First Year</i>	Fall Units	Spring Units
¹ Subject A and American History and American Institutions		..	..
Military Science		2	2
² English 1A-1B or Speech 1A-1B.....		3	3
³ Foreign Language		4	4
Year Course (See requirement (e) for degree of Associate in Arts)		3	3
Political Science 1, 2		3	3
		15	15
	<i>Second Year</i>		
Military Science		2	2
³ Foreign Language		4	4
Physiology 1		3	..
⁴ Psychology 5 or Economics 2 or Mathematics 12.....		..	3
Sociology 1, 2		3	3
Requirement (d) for degree of Associate in Arts.....	variable	variable	variable
Psychology 1A, 3 or 33.....		3	3
		15 plus	15 plus

Natural Science Program: Counselor: Mr. Kirk.

	<i>First Year</i>		
¹ Subject A and American History and American Institutions requirement .....		..	..
Military Science		2	2
Chemistry 1A-1B		5	5
² Speech 1A-1B or English 1A-1B.....		3	3
³ Foreign Language		4	4
Psychology 1A; 1B, 3 or 33.....		3	3
		17	17
	<i>Second Year</i>		
Military Science		2	2
Chemistry 5 .....		..	3
Chemistry 12A-12C		5	3
Physiology 1, 1L		5	..
Physics 2A-2B		3	3
Physics 3A-3B		1	1
⁴ Mathematics 12 (or Economics 2 or Psychology 5).....		..	3
		16	15

¹ For regulations concerning Subject A see page 35. For American History and American Institutions see page 36.

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 61).

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

The Degree of Master of Criminology

Opportunity is offered for graduate study in criminology leading to the degree of Master of Criminology. Advancement to candidacy presupposes the completion of undergraduate requirements in criminology equivalent to those prescribed at the University of California. Except for making up deficiencies in the undergraduate requirements, the graduate student's program may be planned largely to meet his individual needs and interests. Students who have completed the work for the bachelor's degree in the School of Criminology should be able to complete the requirements for the degree of Master of Criminology in one year.

SCHOOL OF EDUCATION

The School of Education offers professional courses intended for students preparing for educational service in elementary, junior and senior high schools, and colleges; for graduate students who are fitting themselves for supervisory or administrative positions in public schools; and for students who propose to engage in school administration, to teach in state colleges or in university departments of education, or to carry on research work in the field of education.

GENERAL REQUIREMENTS

Teacher-Training Curricula

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

Scholarship.—The School of Education will admit to candidacy for recommendation only those students who have maintained a grade-point average of not lower than 1.5 in all studies undertaken in the junior and senior years since reaching junior standing. Students with grade-point shortages may apply to the Director of Supervised Teaching for consideration and advice.

Oral English.—The student must prove that he has a command of spoken English adequate to the purposes of instruction. He may satisfy this requirement by examination, by completing suitable courses in the Department of Speech, or by any other test satisfactory to the Committee on Oral English.

Health Certificate.—The student must take a medical examination and obtain a satisfactory certificate from the University Physician.

Age.—Applicants without teaching experience who are over 35 years of age will not ordinarily be admitted to supervised teaching.

Citizenship.—Each applicant for a credential is required by the State Department of Education to be a citizen of the United States. Noncitizens who have filed their first papers are eligible to apply for short-term credentials. Failure to complete the naturalization process within six months of the date of eligibility will result in the revocation of the credential. After a foreign student has become naturalized he may apply for a long-term credential.

Oath of Allegiance.—The State Department of Education also requires each applicant for a credential to take an oath of allegiance to the United States and to submit identification cards showing fingerprints.

**The Constitution of the United States.*—The State Department of Education requires the completion of a course on the provisions and principles of the Constitution of the United States. This requirement may be satisfied by completing one of the following sequences: History 17A-17B; 171A-171B; 172A-172B; Political Science 157A-157B; or one of the following courses: Political Science 1; 100A; 113.

* These requirements may be satisfied by passing the examination in American History and American Institutions. See statement on page 36 concerning this requirement.

Approval of Schedules.—For information concerning the General Secondary Credential the student should consult Miss Murdock, Credentials Assistant, 107 Haviland Hall, as early as possible in his academic career. 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 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 both to the Dean of the Graduate Division and to the Dean of the School of Education when he files his office record card. On the basis of transferred records the Dean of the Graduate Division issues a statement of the student's official status. The student must present this statement when he files his office record card. His study list cannot be approved until the latter has been filed.

Application for Credential and for Supervised Teaching.—Detailed schedules of procedures may be obtained in 107 Haviland Hall. Applications for supervised teaching (Education 320A, 320C, 323, 324, 330A and 330C) must be made in 107 Haviland Hall not later than November 2, 1953, for the spring semester, 1954, and not later than April 5, 1954, for the fall semester, 1954. Enrollment is limited to available facilities.

Students planning to enroll in supervised teaching (Education 320A, 320C, 320E, 323, 324, 330A, and 330C) should note that these are extra-session courses, in which instruction begins with the beginning of the semester in the public schools and ends at the close of the semester in the public schools. In the fall semester, 1953, instruction in these courses in most cases will begin on September 14, 1953, and end on January 29, 1954; in the spring semester in most cases, it begins on February 1, 1954, and ends on June 18, 1954.

Application to the State Department of Education.—The application to the State Department of Education for a teaching credential must be accompanied by a health certificate (the fee for which is \$5, payable at Cowell Memorial Hospital); duplicate personal identification (fingerprint) cards; and money order, certified check, or cashier's check for \$4, the application fee, made payable to the State Department of Education.

SPECIFIC REQUIREMENTS

The General Secondary Credential

Counselors:—Students may consult one of the following counselors: Mr. C. C. Conrad, 107 Haviland Hall; Mr. T. B. Edwards, 111 Haviland Hall; Mr. W. D. Loban, 108 Haviland Hall; Mr. S. E. T. Lund, 110 Haviland Hall.

Requirements:—The candidate for the recommendation for this credential must satisfy the following specific requirements, in addition to the general requirements described on page 121.

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

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

Education 110 (Educational Psychology).....	3 units
Education 111 (Growth and Development of 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 or decorative art
- (3) Business education
- (4) English or speech
- (5) Foreign language (French or German or Italian or Latin or Spanish).
- (6) Homemaking
- (7) Librarianship
- (8) Life science
- (9) Mathematics
- (10) Music
- (11) Physical education
- (12) Physical science
- (13) Social studies*

The Teaching Major.†—There are two kinds of teaching majors. The first consists of 36 units of which 18 to 24 units are completed in upper division and/or graduate work, the precise amount to be agreed upon by the School of Education in consultation with the subject representative in the department or departments concerned (ordinarily 18 units of the teaching major shall be selected from the departmental major for the bachelor's degree). The second consists of a minimum of 36 units of upper division and/or graduate work in two or more related subjects (e.g., social studies), this major being fixed by the School of Education in consultation with the subject representatives of the departments concerned. In addition to the foregoing minimum requirements, the School of Education will prescribe such graduate courses designed

* 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.

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

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

The Junior College Credential

Counselor: Mr. C. C. Conrad, 107 Haviland Hall.

Requirements.—The candidate for the recommendation for this credential must fulfill the specific requirements listed below, in addition to the general requirements described on pages 121–122.

1. He must complete two semesters of work in residence at this University.

2. He must hold a master's or doctor's degree from this University, or from another institution recognized as equivalent by the Graduate Division, in one of the following fields of study: agriculture, anatomy, anthropology, architecture, art, astronomy, bacteriology, botany, business administration, chemistry, child development, comparative literature, decorative art, economics, engineering, English, forestry, French, geography, geology, German, Greek, history, home economics, Italian, Latin, librarianship, mathematics, mining and metallurgy, music, paleontology, philosophy, physical education, physics, physiology, political science, psychology, sociology and social institutions, Spanish, zoölogy. The major for the master's or doctor's degree is recognized as the teaching major if it is in one of the above fields.

3. He must complete an approved teaching minor in one of the above fields or in a field chosen from the list of teaching majors for the general secondary credential (page 123).

4. He must complete with a scholarship average not lower than one grade point at least 12 units in education courses, including:

Educational Psychology—Education 110.....	2–3 units
The Junior College—Education 279.....	2
Supervised Teaching and Professional Methods:	
(a) Teaching assistants on the campus will take Education 320B, 324, Section 1, and 320E, Section 16	8
(b) All other students will take Education 320B, 324, Section 2, and 320E, Section 16.....	8

Total 12–13 units

5. He must maintain the following scholarship ratings in the various classifications of his work:

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

6. Before final action is taken by the School of Education concerning the recommendation for the junior college credential, the candidate must present a report concerning his attainments and fitness from the professor in charge of his higher degree program. In the case of students transferring with higher degrees from other institutions, the chairman of the department in question at the University of California should be asked for such a recommendation.

The General Elementary Credential

Counselors: Mr. Barnett, 314 Haviland; Mr. Dumas, 107 Haviland; Mr. Michaelis, 316 Haviland; Mr. Russell, 315 Haviland.

Requirements.—The candidate for the recommendation for this credential must satisfy the following specific requirements, in addition to the general requirements described on pages 121–122.

1. He must hold a bachelor's degree from one of the academic colleges of this University or its equivalent.

2. He must take one semester of graduate work.

3. He must maintain the following scholarship ratings in the various classifications of his work:

Upper division work: a grade-point average of at least 1.50

Postgraduate work: a grade-point average of at least 1.50

Education courses: a grade-point average of at least 1.00

Work for the major: a grade-point average of at least 1.00

Work for the minor: a grade-point average of at least 1.00

4. He must complete with a scholarship average of not lower than one grade point the following courses:

	Units
Introduction to Educational Psychology—Education 110.....	3
Growth and Development of Children—Education 111.....	2
Elementary Education—Education 130	3
Arithmetic and Language in the Elementary School—Education 131..	2
Art and Music in the Elementary School—Education 132.....	2
Reading and Literature in the Elementary School—Education 134...	2
Social Studies in the Elementary School—Education 138.....	2
Supervised Teaching, Professional Methods—Education 330A*, 330C*, 330E	10
Supervised Teaching: Materials of Instruction and Class Manage- ment—Education 331	2
Total	28

5. Recommended Sequence of Courses:

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

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

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

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

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

* Application for enrollment in Education 330A and 330C must be filed in Room 107, Haviland Hall, not later than November 5, 1953, for the spring semester, 1954, and not later than April 5, 1954, for the fall semester, 1954.

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

- (a) Art or decorative art
- (b) English and speech
- (c) Foreign language
- (d) Home economics
- (e) Mathematics
- (f) Music
- (g) Natural science
- (h) Physical education
- (i) Social studies
- (j) Psychology, with emphasis on child and clinical psychology
- (k) Group majors chosen from: American civilization, American literature, child development, communications and public policy, East Asiatic studies, international relations, labor and industrial relations, physical education, recreation, sociology. In each case the major must be approved by the Director of Supervised Teaching.
- (l) Regional group majors chosen from: China, Hispanic America, Russia and Eastern Europe, social welfare, wildlife conservation. In each case the major must be approved by the Director of Supervised Teaching.
- (m) Any other major for the A.B. degree in the College of Letters and Science, the content of which is primarily related to the elementary school curriculum, may be accepted, provided that application for acceptance be made to the Committee on Admission to Supervised Teaching and be approved by the Committee.

Courses taken in fulfillment of a major cannot be used to satisfy the minor requirement.

A major for this credential consists of the departmental major offered in satisfaction of requirements for the A.B. degree; or, the 36-unit general (non-major) curriculum offered in satisfaction of requirements for the A.B. degree may be offered in lieu of the departmental major provided it includes at least 24 units in one of the fields listed above, 12 of which are in upper division.

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

7. Other courses required for this credential:

- Psychology 1A, General Psychology (3).
- Decorative Art 6A, Theory of Design and Color (2).
- Physical Education 26, Physical Education Activities (Section on Elementary School Skills) ($\frac{1}{2}$).
- Music 10, Basic Musicianship (2); Music 27A, Introduction to Musical Literature (3) is strongly recommended.
- History 189A or 189B, History of California (2).

The General Junior High School Credential

Counselors: Mr. Barnett, 314 Haviland; Mr. Dumas, 107 Haviland; Mr. Michaelis, 316 Haviland; Mr. Russell, 315 Haviland.

The student must complete the courses specified above for the General Elementary Credential and in addition complete the following course:

Junior High School Education—Education 172 2 units

The candidate for this credential must present a major and a minor in fields commonly taught in junior high schools and must complete an assignment in supervised teaching on the junior high school level.

SCHOOL OF FORESTRY

The School of Forestry, which replaced the curriculum in forestry of the College of Agriculture, July 1, 1946, offers undergraduate and graduate curricula leading to the degrees of Bachelor of Science, Master of Forestry, and Master of Science.

ADMISSION TO THE SCHOOL OF FORESTRY

Candidates for admission to the School of Forestry must qualify in the following ways:

- A. Completion of at least 60 units of work in one of the colleges of the University of California, preferably the preforestry curriculum of the College of Agriculture; or admission to the University in junior standing. In all cases junior standing requires the completion of 60 units of work acceptable to the Board of Admissions of the University.
- B. The candidate must have the following preparation for courses in the curriculum of the School of Forestry:*

	Units
1. Botany (general botany)	5
(This requirement is based on Botany 1 as given at Berkeley. In institutions where such a concentrated course is not available, a year course in general botany is required.)	
2. Chemistry (general inorganic, and organic)	8
3. Engineering (plane surveying)	6
4. Economics (elements of economics)	6
5. Geology (structural)	3
6. Mathematics (analytic geometry and differential calculus)	6
7. Physics (general physics with laboratory)	8
8. Statistical methods	3
9. Zoölogy (general biology)	3
10. A choice of English or speech	6
Total	54

- C. No student with a grade-point average of less than one (C average) will be admitted.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE

Undergraduate students must complete the following requirements for a bachelor's degree:

1. The equivalent of eight 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 49F. 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

* If applicants are otherwise qualified they may be admitted to the summer field practice course, Forestry 49F, 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 49F 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.

high school: mathematics, 3 years, including plane geometry, algebra, and trigonometry.

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

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

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

7. The field practice course, Forestry 49F, in camp at Meadow Valley, near Quincy, in the Plumas National Forest.

8. In addition to requirements 3 and 5 above, University preforestry courses as listed above for admission to the School, and courses in the School of Forestry as follows:

	Units
1. Botany (plant physiology with laboratory)	4
2. Economics or business administration (other than statistics)	3
3. Plant pathology or taxonomic botany	3
4. Soil science	4
5. Zoölogy, upper division, or entomology	3
6. Forestry courses at Berkeley (including Forestry 100, 103, 104, 108, 110, 120, 128, and either 121A, 121B, 122, or 126)	34

PLAN OF STUDY

The Curriculum of the School of Forestry

A single curriculum is offered in the School of Forestry, arranged to give a solid broad training and at the same time to permit specialization. In view of the limited number of specialized positions that are annually available, undergraduate work should remain broad and general; otherwise a man may prepare himself for a particular field in which there may be no opening for many years.

Preforestry

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

Freshman Year

FALL SEMESTER		SPRING SEMESTER	
<i>Course</i>	<i>Units</i>	<i>Course</i>	<i>Units</i>
Chemistry 1A	5	Chemistry 8	3
Geology 1	3	Zoölogy 10	3
Speech 1A or English 1A	3	Speech 1B or English 1B	3
Mathematics 16A	3	Mathematics 16B	3
Military Science	2	Military Science	2
	—		—
	16		14

Sophomore Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Physics 2A, 3A	4	Physics 2B, 3B	4
Engineering 1A†	3	Engineering 1B	3
Economics 1A	3	Economics 1B	3
Botany 1*	5	Statistics	3
Military Science	2	Military Science	2
	—		—
	17		15

In the summer following his sophomore work, the student must attend the field practice course, Forestry 49F. *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
	—	Elective	3
	16		17 or 18

Senior Year

FALL SEMESTER		SPRING SEMESTER	
Course	Units	Course	Units
Forestry 104	4	Forestry 120	4
Soil Science 100	4	A course in economics	3
Zoölogy 116 or Entomology 114	4 or 3	Electives	9
A course in forest economics...	3		—
Elective	3		—
	18 or 17		16

Field Practice Course

Students majoring in forestry are required to attend, after completing their sophomore work, the summer field practice course (Forestry 49F), which is conducted in the Summer Camp of the School of Forestry, at Meadow Valley, near Quincy, in the Plumas National Forest, a leading timber-producing area of the State. Approximately eleven weeks are spent in field work—land surveying, timber surveying, timber estimating, forest mapping, and scaling; in the study of silviculture and tree growth; and in examining logging and milling operations.

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

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

GRADUATE STUDY

The Master's Degree

Opportunity is offered for graduate study in forestry leading to the degree of Master of Science, under Plan I, or Master of Forestry, under Plan II.

The degree of Master of Science requires 20 units of upper division and graduate courses, of which at least 8 units must be strictly graduate work in the major subject, and the satisfactory completion of a thesis. The degree of Master of Forestry requires 24 units of upper division and graduate courses, of which at least 12 units must be in strictly graduate courses in the major subject, and a comprehensive final examination.

Advancement to candidacy for either degree also presupposes the completion of undergraduate requirements in forestry equivalent to those prescribed at the University of California. Except for making up deficiencies in the undergraduate requirements, the graduate student's program may be planned largely to meet his individual needs and interests. The arrangement is flexible enough that the student may either include a broad preparation for professional work or specialize and give a greater part of his time to a specific problem.

The Doctor's Degree

Study and research on a suitable problem in forestry leading to the degree of Doctor of Philosophy may also be undertaken. For training in silviculture, forest ecology, range management, or forest influences, the program ordinarily would be administered by the Plant Physiology or Soil Science group, which include members of the forestry teaching staff. For training in forest economics or management, the candidate would usually work with the Department of Agricultural Economics. The program would include the fulfillment of the minimum requirements of the group or department, together with research and a dissertation on a forest problem appropriate to the combined fields of forestry and plant physiology, or forestry and soil science, or forestry and economics, depending on the individual student's choice.

SCHOOL OF LAW

Preparation for the Study of Law

For the guidance of students who may become applicants for admission to the School, the essentials of a satisfactory prelegal education are summarized as follows:

In the first place, *the prelegal student should follow a plan of study which will assure adequate foundations for broad culture.* Such a plan should include among its objectives: (1) a well-grounded facility in the use of English, written and spoken, and a wide acquaintance with the best of English literature; (2) a familiarity with at least the outlines of human history and a thorough knowledge of the history of our own country and people; (3) an acquaintance with the great philosophers and an understanding of the progress and significance of philosophic thought; (4) a mastery of elementary logic and mathematics and some acquaintance with their application in contemporary life; (5) an introduction to natural science and an appreciation of its tremendous importance in the modern world; and (6) a thorough knowledge of the elements of social science, including the essentials of economics, government, psychology, and other important social studies. Foundations 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 cooperating with the Educational Testing Service and with other law schools in the development and administration of a uniform Law School Admission Test. The test is designed to measure aptitude for professional study, rather than knowledge of subject matter, and no special preparation is necessary. Centers where the test may be taken have been established for the convenience of applicants in all parts of the country. *The test is required of all applicants for admission to this School and should be taken during the academic year preceding the one for which admission is sought.* For application procedures see Admission Procedure, page 132.

The Educational Testing Service will supply each applicant with a bulletin of information giving details with respect to administration and including practice questions. All questions concerning the Law School Admission Test should be addressed directly to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey.

Admission to the Professional Curriculum

Applicants for admission to the professional curriculum of the School of Law, leading to the degree of Bachelor of Laws, must have received the degree of Bachelor of Arts or Bachelor of Science from the University of California,

or an equivalent degree from a college or university of approved standing. The program of study leading to the degree should be in substantial conformity with the essentials of a satisfactory prelegal education (see page 130).

Applicants who have achieved a 2.0 (B) average in the work of the last two prelegal years may be admitted unless their scores on the Law School Admission Test are so low as to demonstrate a lack of capacity for the work of the professional curriculum.

Applicants having less than a 2.0 average, but at least a 1.5 (C+) average, may be admitted if they give sufficient evidence through their scores on the Law School Admission Test, or otherwise, of capacity for the work of the professional curriculum. Such applicants may be asked to present themselves at the School for personal interviews before admission is granted.

Applicants must also submit satisfactory references as to character, including the names and addresses of not fewer than three disinterested and responsible persons to whom the applicant is well known and to whom the faculty may appropriately address inquiries with respect to the applicant's character. Wherever possible, the character references should include a member of the Bar who is a graduate of the School of Law or of another law school approved by the American Bar Association.

Applicants who have completed at least one year of work in another law school may be admitted to the second year of the professional curriculum with credit for not more than one year of such work if (1) the applicant would have been eligible for admission to the first year in this School, (2) the work has been completed in a school which is a member of the Association of American Law Schools, and (3) the work for which credit is sought has been of superior grade. The faculty reserves the privilege of prescribing further conditions for the granting of such credit and may, in its discretion, require examinations in subjects for which credit is sought.

Students who have been disqualified at another law school will not be admitted to this School.

The professional curriculum is so arranged that beginning students must enter the School at the opening of the fall semester. To be assured of satisfactory programs, students transferring from other law schools should also plan to enter at the opening of the fall semester.

Admission Procedure*

1. The initial application for admission to the School of Law should be made on forms which will be supplied by the School and should be addressed to the School of Law, University of California, Berkeley 4. It should be accompanied by transcripts of all college, university, or professional school records other than the records of work completed at the University of California, Berkeley. Where the applicant is currently in a college or university, the transcripts should cover all work completed to date and should be accompanied by a statement indicating the time when it is expected that the work pending will be completed and the necessary supplemental transcripts supplied. To insure consideration of an application for admission in September, 1954, the initial application should be received by the School by May 1, 1954. Actual receipt of the initial application by the School is the applicant's responsibility. In no circumstances should the initial application be addressed to another department or office of the University.

2. Applicants are also required to apply for admission to the Graduate Division. This application should be made on forms which will be supplied by the Graduate Division and should be addressed to the Graduate Division, University of California, Berkeley 4, accompanied by a remittance in the sum of \$5 payable to The Regents of the University of California. The remittance of

* The procedure herein applies to the class entering in the fall semester of 1954.

\$5 is not required of veteran applicants who expect to enroll under the provisions of Public Law 346 (the G. I. Bill of Rights) or Public Law 16. Persons governed by Public Law 550 ("Korean" G. I. Bill) must pay this fee from their allotment. This application must also be accompanied by official transcripts of record other than the records of work completed at the University of California, Berkeley. Such transcripts are in addition to those accompanying the initial application to the School of Law. Since applicants cannot be admitted to the School until they have been admitted to graduate standing, the application should be filed 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 law teaching, legal research, government service, or legislative drafting, may become a candidate for the degree of Master of Laws (LL.M.) or the degree of Doctor of the Science of Law (J.S.D.).

Admission to the graduate curriculum, as a candidate for either the LL.M. or the J.S.D. degree, may be granted to any applicant who has had at least six years of resident study at approved colleges and law schools, who holds a professional degree from a law school approved by the American Bar Association, and who, in the opinion of the faculty, gives evidence of capacity to complete the requirements for the degree; except that an applicant who has not received the A.B., B.S., or equivalent degree may be admitted only if the faculty concludes that his preparation in social sciences other than law has not been unreasonably limited.

Admission to the graduate curriculum, though not as a candidate for a degree, may also be granted to any applicant who holds a professional degree from a law school approved by the American Bar Association and who, in the opinion of the faculty, gives evidence of capacity to continue advanced legal study successfully. An applicant so admitted may, after completion of one academic year of resident study, depending on his achievement and proved ability, be admitted as a candidate for the LL.M. or J.S.D. degree.

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

SCHOOL OF LIBRARIANSHIP

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

The A.B. degree of the University of California or its equivalent, a grade-point average of at least 1.5 (C+) in the last two years of academic work,

graduate standing, without deficiencies, in the University, and a college year 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, must have had not less than eight units of each of two modern foreign languages 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 70). 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 Office of the Director of Admissions, The University of California Medical Center, San Francisco 22, California. Applications for the September, 1954, first-year class must be filed between October 1, 1953, and November 30, 1953, but no application blanks will be issued by the Office of the Director of Admissions after November 15, 1953. It will not be possible to give a statement of tentative acceptance to any applicant.

Enrollment in the School of Medicine is limited. Candidates for admission to the first-year class are accepted primarily on the basis of scholarship, particular emphasis being placed on the required subjects. Two personal interviews are held. Each applicant must take the Medical College Admission Test. Applicants for the September, 1954, class must take the Medical College Admission Test in 1953 unless it has been taken before that time. Many medical schools will ask that the test be taken in May, 1953. The University of California School of Medicine prefers that students arrange to take the examination at the later date, that is, in November, 1953, although either time is acceptable. Normally, students must apply to take the Medical College Admission Test at least three weeks, but not more than three months, prior to the scheduled date. The test should be repeated if at the time of application, more than two years have elapsed since the last test. Placards announcing the date, time, and place of the test will be posted at the University of California, on the Berkeley, Los Angeles, and Santa Barbara campuses, and at other universities and colleges. Further information may be obtained from the Educational Testing Service, Princeton, New Jersey.

The student must complete all premedical requirements, including American History and American Institutions, not later than the spring semester preceding his admission. Since Zoology 4 is a required course for the School of Medicine, and as this particular course is given in very few places other than at the University of California, it may be taken during either of the last two summer sessions at the University of California immediately preceding admission to the School of Medicine. All other courses must be completed by the end of the spring semester preceding admission.

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

The procedure for making interview appointments is as follows:

1. The application and all transcripts of record are filed with the Office of the Director of Admissions.
2. Upon completion of evaluation of the records by the Office of the Director of Admissions, the Dean's Office is notified.
3. Qualified applicants are then requested by the Dean's Office to make appointments for two interviews.

Certain applicants may be rejected, without interview, because of low premedical scholarship, and/or a low score in the Medical College Admissions Test, and, occasionally, for other reasons. Attention is called to the fact that no personal interview appointments are given until the applicant's record has been evaluated.

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 im-

mediately 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, 1954, 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 1954 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 one of the following requirements:

1. Bachelor's Degree:

Applicants for admission on this basis must hold a bachelor's degree with a major in one of the biological sciences. Courses taken in preparation for the major must have included Bacteriology 101 and Biochemistry 102 or 100A-100B, and 101A-101B, or their equivalent.

2. Three years of college training:

Applicants for admission on this basis must have completed three years of a regulation curriculum in medical or clinical laboratory technic. This curriculum must have included courses in biochemistry and advanced

bacteriology. Applicants will not be considered unless the college they attended shall grant a bachelor's degree to them upon satisfactory completion of the four-year curriculum.

Curriculum.—The course is given as a practical apprenticeship. It consists of one year (48 weeks) of full-time work, and covers training in biochemistry, medical bacteriology, parasitology, mycology, histological technic, clinical pathology, serology, blood bank procedures, basal metabolism, and electrocardiography. Upon satisfactory completion of the course, the student is eligible for the State Examination and the National Registry Examination.

Certificate.—A certificate is given upon satisfactory completion of the course.

Fees.—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***
	<hr/>	<hr/>	<hr/>	<hr/>
	\$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

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

units of biological and physical science. Upon satisfactory completion of the course, the student is awarded a certificate.

2. Three years of college or university training.

Candidates for admission on this basis must have completed courses that qualify them for senior standing in the College of Letters and Science of the University of California, and the requirements in the basic sciences of the Curriculum in Physical Therapy. The student may matriculate into the Curriculum in Physical Therapy in his fourth year of college and obtain the degree of Bachelor of Science 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
	<hr/>	<hr/>	<hr/>	<hr/>
	\$110.00	\$185.00	\$110.00	\$185.00

For further information, write to the Technical Supervisor, Curriculum in Physical Therapy, The University of California Medical Center, San Francisco 22.

X-RAY TECHNICIANS

A training program for X-ray technicians is offered at the University of California School of Medicine. 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.

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 SEMESTER	
	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. Graduates of this program are eligible to apply for the California Public Health Nursing Certificate without examination.

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

Requirements for Admission

The completion of the requirements for the degree of Associate in Arts as prescribed by the College of Letters and Science or the College of Applied Arts is required for admission to the School of Nursing. The work taken to satisfy this requirement must include the specified courses outlined on page 140 of this bulletin.

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

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

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>Fall</i> Units	<i>Spring</i> Units	<i>Second Year</i>	<i>Fall</i> Units	<i>Spring</i> Units
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			
	<hr/>	<hr/>		<hr/>	<hr/>
	15	15		15	15

The American History and American Institutions examinations, or courses in satisfaction of the requirement, should be completed. See page 36.

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

Graduates of approved nursing schools who have met the matriculation requirements of the University may be admitted to the professional program upon completion of a minimum of 60 units of work, with at least a C average, in courses selected in accordance with Plan I or Plan II, including such special requirements as may be prescribed by the Faculty of the School of Nursing.

Plan I.—Completion at Berkeley, or elsewhere, of the program of study required for junior standing by the College of Letters and Science of the University of California, or the substantial equivalent.

Plan II.—Completion at Berkeley, or elsewhere, of the program of study required for junior standing by the College of Applied Arts, University of California, Los Angeles, or the substantial equivalent.

Additional Requirements for Graduation

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

2. Completion of the final year of study in the academic departments of the University of California, Berkeley. Two semesters or one semester and two summer sessions satisfy this requirement.

Specialization in Advanced Psychiatric Nursing

In cooperation with the United States Public Health Service and the Langley Porter Clinic, a major in nursing education with specialization in advanced

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

psychiatric nursing has been established under the provisions of the National Mental Health Act. The requirements for admission to the professional program are as stated above. In addition, Psychology 33, 3 units, and Sociology and Social Institutions 1 and 2, 6 units, are desirable. Psychiatric experience is advantageous.

Program Satisfying Requirements for Admission to the School of Nursing

(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	4
*Natural science	5	3	3
English or speech (year course)	3	3	3
Year course	3	3	3
Electives .....	..	2	2
		15	15
† <i>Second Year</i>			
Psychology 1A	3	..	..
Natural science	4	..	..
Year course	3	3	3
‡Electives	5	5	12
		15	15

Program in the School of Nursing Leading to the Degree of Bachelor of Science

§*Third Year*

	<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	2	3
Communicable disease			Public health nursing	2	3
nursing	1	2	Child health	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

* 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 61-62.

‡ 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. If, however, the requirements are not fully met, students must select suitable courses to supplement their basic nursing preparation.

Fourth Year

General Requirements

Education (including Education 110).....	5 units
Socioeconomics (including Social Welfare 100).....	5 units
|| American History and American Institutions... courses or examinations	

Major in Nursing Education

Major in Public Health Nursing

	Units		Units
General Requirements	10	General Requirements	10
Nursing 432	2	Public Health 145	3
Nursing 434	3	Public Health 100A	3
Electives	15	¶ Education 151	2
	—	Nursing 416	3
	30	Nursing 418-419	6
In lieu of electives students special- izing in advanced psychiatric nursing include:		Electives	3
Psychology (including 111, 136, 168)	8		—
Anthropology 118A	3		30
Sociology 130	3		

The degree of Bachelor of Science will be conferred upon completion of 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 Department of Nursing offers a program of study 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. For further information, see the ANNOUNCEMENT OF THE SCHOOL OF NURSING.

Fees and Expenses

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

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

|| For list of courses accepted in fulfillment of the requirement of American History and American Institutions, or for other means of satisfying the requirement, see page 36.

¶ May be counted as satisfying 2 units of the general requirement in Education.

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, Room 210, Building T-8, 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, 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.

Ordinarily thirty-five of the fifty applicants admitted to the first-year (junior) class must be California applicants. In the event that there are fewer than thirty-five California applicants the remainder of the first-year class may be filled by nonresident applicants, special consideration being given to applicants from states west of the Mississippi.

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 should be filed with the Director of Admissions by May 1 of that year in order to receive consideration. For students who are not already resident at the University of California, the application for admission must be accompanied by a small passport-type photograph and a certificate from a physician which states in detail the physical condition of the applicant based upon a thorough medical examination; any physical or mental handicap of the applicant should be indicated. The Committee on Admissions of the School of Optometry reserves the right to refuse admission to an applicant on the basis of obvious disability which in the opinion of the Committee would interfere with successful completion of the curriculum.

For admission to the School of Optometry the applicant is required to show completion of the requirements for the degree of Associate in Arts as prescribed by the College of Letters and Science, or the equivalent. The courses taken for the degree of Associate in Arts should include the following specific subjects required by the School of Optometry: anatomy*, bacteriology, chemistry, physics, plane analytic geometry, psychology, speech or English, and zoology*.

An accepted applicant who finds it impossible to begin his work in the School of Optometry in September, 1953, 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.

* 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-Human Anatomy

Zoölogy 1A-Comparative 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.

PREOPTOMETRY CURRICULUM

<i>Freshman Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Sophomore Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
Subject A (see page 35)	—	—	Military Science ...	2 or 0	2 or 0
Military Science ...	2 or 0	2 or 0	*Anatomy 102	—	3
Chemistry 1A-8 ...	5	3	Bacteriology 2	—	4
Mathematics 3A ...	—	3	Physics 2A-2B ...	3	3
Speech 1A-1B (or English 1A-1B) ..	3	3	Physics 3A-3B ...	1	1
†Foreign Language ..	4	4	Psychology 1A-33 (or 1A-1B) ...	3	3
‡Elective	1 or 3	0 or 2	*Zoölogy 1A	4	—
			§Elective	2 or 4	0 or 2
	15	15		15	16

The foregoing program if satisfactorily completed will meet the requirements for the degree of Associate in Arts in the College of Letters and Science at the end of the fourth semester, and the prerequisite subjects for the study of optometry, provided the following high school subjects have been offered for matriculation: algebra, chemistry, physics, plane geometry, trigonometry, and three years of a foreign language.

The following required curriculum taken in the School of Optometry leads to the degree of Bachelor of Science at the end of the senior year and the Certificate in Optometry and the degree of Master of Optometry at the end of the graduate year. For further information and detailed degree requirements see the ANNOUNCEMENT OF THE SCHOOL OF OPTOMETRY.

REQUIRED CURRICULUM IN OPTOMETRY

<i>Junior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>	<i>Senior Year</i>	<i>Fall Units</i>	<i>Spring Units</i>
American History and American Institutions (see page 36)	—	—	Optometry 101	3	—
Optometry 102A-102B ..	3	4	Optometry 103A-103B ..	3	3
Optometry 401A-401B ..	2	2	Optometry 404A-404B ..	3	3
Physics 108A-108B (2) ..	3	3	Optometry 406A-406B ..	2	2
Physiology 110A-110B ..	3	3	Optometry 407A-407B ..	1	2
Physiology 115	4	—	Physiological Optics 105A-105B	3	3
††Elective	1	3	Physiological Optics 106A-106B	1	1
			††Elective	—	3
	16	15		16	17
<i>Graduate Year</i>					
			Optometry 409A-409B ..	6	6
			Optometry 412A-412B ..	3	3
			Optometry 414A-414B ..	2	2
			Optometry 416A-416B ..	2	2
			Optometry 417	—	1
			Physiological Optics 203 ..	2	—
			Physiological Optics 205 ..	—	1
				15	15

* See asterisk (*) footnote on page 143.

† Students must have had three years of a foreign language in high school.

‡ See Associate in Arts degree requirements, College of Letters and Science, as described on page 61.

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

SCHOOL OF PUBLIC HEALTH

Students who are considering a major in public health should report to the Dean's office, School of Public Health, as early in their academic career as possible. Formal application for admission to the School of Public Health should be made not later than the last semester of the sophomore year. Those applying for admission to the School any later may encounter difficulty in arranging proper sequences for prerequisite and required courses in the School of Public Health.

Admission.—To be admitted to the School of Public Health, students must have completed at least 60 units in one of the colleges of the University or an equivalent thereof satisfactory to the Faculty of the School of Public Health. In order to complete the work in the minimum number of semesters, students should also have completed the prerequisite courses listed below.

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

(1) *General Requirements:*

Subject A. (See page 35.)

Military Science and Tactics. (See page 38.)

American History and American Institutions. (See page 36.)

(2) *Basic subjects required for all public health majors:*

Public Health 5A-5B.

Bacteriology 2.

Chemistry 1A.

Physiology 1-1L¹ or Zoölogy 1A or 10.²

Psychology 1A.

At least 6 units from:

English 1A, 1B.

Speech 1A, 1B

At least 6 units from:

Anthropology 2A, 2B

Economics 1A, 1B.

Geography 1, 2.

Mathematics 3A, 3B.

Sociology and Social Institutions 1, 2.

(3) *Additional requirements for specific majors as indicated:*

Biostatistics

Mathematics 3A-3B.

Laboratory (Public Health and Clinical)

Chemistry 1B, 5, 8.

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

Zoölogy 1A.

Preadministration

Business Administration 1A-1B.

Economics 1A-1B.

Political Science 1.

Public Health Education

Public Health 35.

Decorative Art 6A.

Physical education activities (2 units).

Psychology 33.

¹ Physiology 1-1L is not acceptable for Laboratory majors.

² Zoölogy 10 is not acceptable for Health Education, Laboratory, or Sanitation majors.

Sanitation

Chemistry 1B, 8.

Mathematics C (if not completed in high school).

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

Recommended electives: Chemistry 5, 9, Engineering 8, 21, and 22.

PROGRAM IN THE SCHOOL OF PUBLIC HEALTH—UNDERGRADUATE CURRICULA

Candidates for the degree of Bachelor of Science must have completed at least 120 units of college work, including the specific requirements of one of the majors. A minimum of 24 units must be completed after admission into the School of Public Health. The student must have obtained at least as many grade points as there are units in the total credit value of all courses undertaken by him in the University of California. He must have satisfied the requirement of American History and American Institutions. (See page 36.)

The Majors(1) *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.

Mathematics.

Psychology.

Sociology.

Zoölogy.

Electives.

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

Public Health 100A, 110, 147A, 147B, 150A, 150B, 162.

Bacteriology 101.

Biochemistry 102.

Entomology 117.

Zoölogy 140.

Electives.

For those emphasizing clinical laboratory, Physics 2A-2B, 3A-3B, and Zoölogy 119A-119B are recommended. For those emphasizing public health laboratory, recommended electives are other public health courses, Entomology 126, Food Technology 113.

(3) *Preadministration*

Required for all preadministration majors:

Public Health 100A, 100B, 106, 110, 134, 162, 187.

Anthropology, 3 units.

Economics 130A, 185.

Psychology 145.

Plus one of these three groups:

A. Required for those interested in public health administration:

Public Health 147A, 170.

Business Administration 151.

One of the following:

Political Science 102A, 103A, 175.

Electives.

B. Required for those interested in hospital management:

Public Health 145.

Business Administration 122, 140, 150, 151.

Political Science 158.

Psychology 187.

Electives.

C. Required for those interested in medical care administration:

Public Health 145, 170.

Business Administration 140, 151.

Political Science 158, 175.

Electives.

(4) *Public Health Education*

Public Health 100A, 106, 110, 125, 131, 133, 134, 135, 136, 145, 162.

Anthropology 118A, 118B or Sociology 148A-148B.

Education 106, 170, 181.

Home Economics 111, 137.

Psychology 145, and one additional upper division psychology course.

Electives.

(5) *Sanitation.*

Public Health 100A, 110, 112, 113A, 113B, 114, 134, 147A, 147B, 153, 162, 170, 198.

Bacteriology 101.

Entomology 126.

Food Technology 112.

Not less than 7 units from either (A) or (B):

A. For students interested in the biological and social science aspects:

Public Health 171, 186.

City Planning 110.

Civil Engineering 123.

Political Science 185.

Zoölogy 109.

B. For students interested in the physical science aspects:

Civil Engineering 108A, 123, 124.

Engineering 23, 35.

Engineering Design 102B.

Mathematics 4A, 4B.

Mechanical Engineering 103, 105A, 105B.

Electives.

Premedical students who have met all requirements for the first three years in the College of Letters and Science may be admitted to the School of Public Health as candidates for the B.S. degree (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.

Honors

Students whose work has been of marked excellence may receive Honors or Highest Honors at graduation.

Graduate Curricula

DEGREE OF MASTER OF PUBLIC HEALTH

Admission.—To be admitted to the curriculum leading to the degree of Master of Public Health, the student must have graduated from an approved medical school, college of dentistry, or college of engineering, or have received an acceptable bachelor's degree with adequate training in mathematics and the

natural sciences including chemistry and biology, and in the social sciences; he must be qualified in some professional capacity for postgraduate education in public health; and must have, in addition, either

- (1) Professional academic qualification in engineering, nursing, education, or postgraduate work in other fields of public health; or
- (2) Three years of experience in responsible public health practice.

An applicant for the M.P.H. degree who does not have a doctoral degree must have completed the requirements of the major in his respective 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 graduate courses. An average of not less than two grade points per unit must be maintained in all work completed in graduate standing. By special permission, a candidate may be authorized to present an acceptable thesis in lieu of 4 of the 24 units required.
- (2) A comprehensive final examination either in the student's field of specialization or in the general field of public health, as determined by the faculty committee.
- (3) At least twelve weeks of approved field service in a public health agency. This may be waived for those presenting evidence of previous qualifying experience.

DEGREE OF DOCTOR OF PUBLIC HEALTH

Admission.—To be admitted to the curriculum leading to the degree of Doctor of Public Health the student must ordinarily hold the M.D. degree. In exceptional cases, however, a candidate may be admitted who holds from an approved university a doctoral degree other than that of M.D. The candidate must have completed with a B average, or better, basic courses equivalent to those required for the degree of Master of Public Health at the University of California.

General requirements for the degree:

- (1) In addition to requirements indicated above, the candidate must have completed in residence at the University of California at least one academic year of work involving advanced specialization in the particular field of public health for which he is preparing.
- (2) The candidate must have indicated his capacity to make a substantial contribution to the advancement of the science and art of public health by submitting a dissertation on a subject chosen by himself and bearing on his principal subject of study, and of such character as to show power to prosecute independent investigation. The dissertation must have received the approval of a special committee in charge of the dissertation, appointed by the Dean of the School of Public Health with the approval of the Graduate Council, and must have been defended by the candidate before a committee appointed in the same manner and including the members of the special committee in charge of the dissertation. Special emphasis will be laid upon the requirement of a dissertation, and the degree will in no case be given merely for the faithful completion of a course of study, however extensive.

- (3) The candidate must have demonstrated ability for practical leadership in his field, either
- (a) By prior successful professional experience in a post involving the exercise of substantial initiative and responsibility, or
 - (b) By such other means as the Faculty of the School of Public Health may prescribe.

SCHOOL OF SOCIAL WELFARE

The School of Social Welfare offers a graduate curriculum leading to the professional degree of Master of Social Welfare (M.S.W.). The graduate program consists of two academic years (four semesters). The work of the first year is designed to give all students a knowledge of the social services and related problems, and an opportunity to develop skill in professional practice. In the second year of study, students extend and develop the knowledge and skills acquired in the first year and concentrate on areas of special interest such as family and child welfare, corrections, medical social work, psychiatric social work, social welfare administration, social group work, or social welfare research. These areas are selected in accordance with the student's interests and aptitudes.

Students who are unable to continue immediately to the second year are qualified for some professional positions in social work. They are eligible for junior membership in the American Association of Social Workers, and are eligible to take the official State of California examination for Registered Social Workers.

Requirements for admission.—Admission to the School of Social Welfare is limited to students who:

- (A) Hold the degree of Bachelor of Arts or Bachelor of Science from the University of California or an equivalent degree from a college or university of recognized standing, and who have established their eligibility for admission in graduate standing at the University of California.
- (B) Are not over 35 years of age; however, for persons who, through experience in the field, have demonstrated good capacity for social work, this requirement may be waived.
- (C) Are in good health, as indicated by a thorough medical and physical examination conducted by the University of California Student Health Service at time of registration.
- (D) Comply with either of the following requirements:
 - 1. Completion of the group major in social welfare offered at the University of California, Berkeley, or of an equivalent major.
 - 2. Completion of the University of California courses listed below, or their equivalents, or presentation of satisfactory evidence (ordinarily by writing noncredit qualifying examinations) that they have adequate knowledge of the subject matter of such courses:
 - a. Economics 1A-1B (Elements of Economics).
 - b. Psychology 1A (General Psychology).
 - c. Economics 2 (Elementary Statistics), or Psychology 5 (Introduction to Psychological Measurements), or some other course in elementary statistical methods such as Sociology 16, Education 114, or Public Health 162.
 - d. Economics 150 or 152 (Labor Economics) or some other course in social economics, such as Economics 180 (The Problems of Poverty), or Economics 185 (Social Insurance), or courses in sociology.
 - e. Psychology 160 (Mental Deficiency) or some other course in clinical or abnormal psychology.

In the case of applicants who have completed one or more years of study at another graduate school of social work, this requirement may be modified at the discretion of the School. Attention is directed to the fact that preparation in elementary statistics is prerequisite to the research course given in the first-year program in the School.

- (E) Satisfy the Admissions Committee of the School that they are also suitable in other respects for the profession of social work.

Undergraduate preparation.—The group major in social welfare, described on page 75, is strongly recommended for students preparing for admission to the School of Social Welfare. Alternatively, they may take undergraduate majors in economics, psychology, political science, or sociology, or a group major in social science, these majors to include the prerequisite courses listed above. Students looking toward social work education should consult the School of Social Welfare as early as possible in their college careers for advice.

Requirements for the master's degree.—The degree of Master of Social Welfare (M.S.W.) will be granted to students who:

- A. Have been admitted to the School of Social Welfare in accordance with the regulations of the Academic Senate.
- B. Have spent two years of graduate study in social welfare, including at least one year in residence at the University of California (Berkeley).
- C. Have completed a program of study approved by the School, according to one of the following plans:

Plan 1. (a) There are required at least 40 units in upper division, graduate, and professional courses, including a minimum of 20 units of upper division and graduate courses completed with an average grade not lower than grade B; *(b)* the completion of a satisfactory thesis; and *(c)* the passing of a comprehensive final examination in the field of social welfare.

Plan 2. (a) There are required at least 44 units in upper division, graduate, and professional courses including a minimum of 24 units of upper division and graduate courses completed with an average grade not lower than grade B; and *(b)* the passing of a comprehensive final examination in the field of social welfare.

- D. Students who have completed courses which are part of the social welfare curriculum in an accredited school of social welfare elsewhere than at the University of California, *may* be granted credit for such courses to the value of not more than 24 units. Not more than 4 such units will be accepted, however, toward satisfaction of the required 20 or 24 units in upper division and graduate courses. Such students must have maintained an average grade not lower than B in *all* those upper division and graduate courses undertaken in graduate residence at the University of California.

Dates for filing applications.—Admission to the School of Social Welfare is possible only in the fall of each year. Applications should be submitted as early as possible after the first day of January of the year in which the student wishes to begin his work. Application forms may be obtained at the School of Social Welfare, Building T-1, Berkeley 4, California.

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

CURRICULUM IN HOSPITAL DIETETICS

The Department of Home Economics of the College of Agriculture, with the approval of the Graduate Council, is authorized to issue a Certificate in Hospital Dietetics to students who complete with an average grade of at least B the curriculum described below, and an internship of 4 months approved by the curriculum adviser.

Requirements for admission.—Applicants must hold a bachelor's degree with a major in the field of food and nutrition, including quantitative techniques, from a university or college of recognized standing, must present satisfactory certificates of health, and, in addition, must have the approval of the departmental committee concerned with the training in hospital dietetics.

Course of study.—The curriculum extends over a period of at least one calendar year, including one semester of residence at the University of California Hospital in San Francisco, one semester of residence at the University of California in Berkeley and a four-month period of internship assigned by the curriculum adviser. During the residence in San Francisco the student must complete 8 units of instruction and supervised practice in hospital dietetics, and during the residence in Berkeley 10 to 15 units of work, partly in graduate courses, and ordinarily including courses in human nutrition or diet in disease, laboratory methods in metabolism or advanced biochemistry, marketing or business administration, and hospital dietetics.

All inquiries should be addressed to the Chairman of the Department of Home Economics, University of California, Berkeley 4.

INSTITUTE OF INDUSTRIAL RELATIONS

The Institute of Industrial Relations, authorized by the Legislature of the State of California in 1945, began operations in 1946. It is concerned with three principal types of activity: (1) pursuing an integrated interdisciplinary research program currently directed primarily toward the study of wage structures and wage analysis, the labor market, collective bargaining systems and processes, internal government of private associations, perspectives and perceptions in the industrial community, the aging population, and industrialization and comparative labor movements. Research staff members of the Institute are usually drawn from the regular faculties of the business administration, economics, political science, sociology, and psychology departments; (2) conducting, in cooperation with University Extension, a community relations program serving management, unions, and other groups interested in industrial relations. The program consists of public lectures, conferences, institutes of varying duration, and evening courses; (3) consulting with teaching departments about the development and coordination of a well-rounded, essentially non-vocational curriculum in the field of labor-management relations. The Institute has no curriculum and offers no courses of its own, but it does issue a Curriculum Handbook which outlines the industrial relations courses offered by teaching departments on the Berkeley campus. This Handbook, which also describes the activities of the Institute of Industrial Relations, may be obtained from the Institute of Industrial Relations, Room 201, California Hall, University of California, Berkeley 4. Mr. Ewald T. Grether 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 Literatures may be selected for inclusion in the curricula for the master's and doctor's degrees in Slavic studies.

Further information may be obtained from the Director, Mr. Robert J. Kerner, Room 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 Pharmacy, Master of Public Health, Master of Social Welfare, Doctor of Education, Graduate in Architecture, Doctor of Engineering, Bachelor of Laws, Master of Laws, Juris Scientiae Doctor, Doctor of Medicine, Doctor of Public Health, Doctor of Veterinary Medicine, and Doctor of Philosophy.

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PART II

Announcement of Courses

Announcement of Courses

DEPARTMENTS AT BERKELEY

Fall and Spring Semesters

1953-1954

SEPTEMBER 1, 1953

UNIVERSITY OF CALIFORNIA
BERKELEY

CALENDAR*

Referring Primarily to the Departments of the University at Berkeley

FALL SEMESTER, 1953-1954

July 15, Wednesday	Last day for filing credentials and applications for admission to graduate standing.
Aug. 13, Thursday	Applications for readmission to the fall semester to be filed with the Registrar by former students, graduate and undergraduate.
Aug. 15, Saturday	Final date for applications for admission to the fall semester and credentials to be filed with the Director of Admissions. Credentials received as late as this may not be evaluated in time for the enrollment of the student during the regular registration period.
Sept. 7, Monday	Labor Day—an academic and administrative holiday.
Sept. 14, Monday	Fall semester begins.
Sept. 14, Monday	Subject A Examination, 2 to 5 p.m.
Sept. 15, Tuesday	Mathematics 3 and 3A Qualifying Examination 4:15 to 5:45 p.m.
Sept. 15, Tuesday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the fall semester.
Sept. 16, Wednesday	
Sept. 17, Thursday	
Sept. 17, Thursday	Chemistry 1A Aptitude Test, 4 to 5 p.m.
Sept. 21, Monday	Instruction begins.
Oct. 1, Thursday	All candidates for the degree of Associate in Arts, or for a bachelor's degree, who expect to complete the work for the degrees in January, 1954, file announcement of candidacy before 5 p.m., at the office of the Registrar, Administration Building.
Oct. 2, Friday	Last day for filing applications in candidacy for all master's degrees to be conferred in January, 1954; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 9, Friday	Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1954; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Oct. 26, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula to be received in January, 1954; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Nov. 6, Friday	Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1954.
Nov. 26, Thursday	Thanksgiving Day—an academic and administrative holiday.
Dec. 15, Tuesday	Last day for filing credentials and applications for admission to graduate standing.
Dec. 18, Friday	Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in January, 1954.
Dec. 21, Monday	} Christmas Recess—an academic holiday.
Jan. 2, Saturday	
Dec. 24, Thursday	} Christmas Holiday—academic and administrative.
Dec. 25, Friday	
Dec. 31, Thursday	Last day for students enrolled in the current session to file applications for undergraduate scholarships for 1954-1955.
Dec. 31, Thursday	} New Year's Holiday—academic and administrative.
Jan. 1, Friday	

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

Jan. 4, Monday	Instruction resumes.
Jan. 18, Monday	} Final examinations in the departments at Berkeley.
Jan. 28, Thursday	
Jan. 28, Thursday		Fall semester ends.

SPRING SEMESTER, 1954

Jan. 7, Thursday	Applications for readmission to the spring semester to be filed with the Registrar by former students, graduate and undergraduate.
Jan. 15, Friday	Applications for admission to the spring semester and credentials to be filed with the Director of Admissions.
Feb. 8, Monday	Spring semester begins.
Feb. 9, Tuesday	} Registration of students, graduate and undergraduate, in the departments at Berkeley for courses of the spring semester.
Feb. 10, Wednesday	
Feb. 11, Thursday	
Feb. 15, Monday	Instruction begins.
Feb. 15, Monday	Last day for filing applications for fellowships and graduate scholarships for 1954-1955.
Feb. 22, Monday	Washington's Birthday—an academic and administrative holiday.
Feb. 25, 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, 1954, file announcement of candidacy before 5 p.m., at the office of the Registrar, Administration Building.
Feb. 26, Friday	Last day for filing applications in candidacy for all master's degrees to be conferred in June, 1954; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 1, Monday	Last day for entering students to file applications for undergraduate scholarships for 1954-1955.
Mar. 5, Friday	Last day for filing applications in candidacy for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in January, 1955; office of the Dean of the Graduate Division, 102 Administration Building. All signatures required upon these applications must be obtained in advance.
Mar. 8, Monday	Last day for filing applications and programs in candidacy for the certificates of completion of teacher-training curricula, to be received in June, 1954; office of the Faculty Counseling Committee of the School of Education, 107 Haviland Hall.
Mar. 26, Friday	Last day for filing in final form with the committees in charge theses for the degrees of Doctor of Philosophy, Doctor of Public Health, Doctor of Engineering, Doctor of Education, and Graduate in Architecture, to be conferred in June, 1954.
Apr. 26, Monday	} Spring recess—an academic holiday.
May 1, Saturday	
May 17, Monday	Last day for filing in final form with the committees in charge theses for master's degrees to be conferred in June, 1954.
May 31, Monday	Memorial Day—an academic and administrative holiday.
June 7, Monday	} Final examinations in the departments at Berkeley.
June 17, Thursday	
June 17, Thursday	

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THE UNIVERSITY OF CALIFORNIA

LETTERS AND SCIENCE LIST OF COURSES

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

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

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

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

- | | |
|---|---|
| Agricultural Economics 112A, 112B, 120. | Entomology 100, 106, 110, 112, 117, 119, 126, 127, 129, 131, 133. |
| Anatomy. All undergraduate courses. | Forestry 1, 103, 122, 125. |
| Anthropology. All undergraduate courses. | French. All undergraduate courses except 20. |
| Architecture 5A, 5B, 5C, 5D, 14A, 14B, 113A, 113B, 114A, 114B, 117, 146, 148A, 148B. | Genetics. All undergraduate courses. |
| Art. All undergraduate courses. | Geography. All undergraduate courses. |
| Astronomy. All undergraduate courses, except 3 and 11. | Geological Sciences. All undergraduate courses. |
| Bacteriology. All undergraduate courses. | German. All undergraduate courses. |
| Biochemistry. All undergraduate courses. | Greek. All undergraduate courses. |
| Botany. All undergraduate courses except 155. | History. All undergraduate courses. |
| Business Administration 1A, 1B, 10, 18, 100, 150. | Italian. All undergraduate courses. |
| Chemistry and Chemical Engineering. All undergraduate courses except 143, 144, 145A, 145B, 146A, 146B, 147, 149, 152. | Journalism 120A, 120B, 140, 141, 190, 195, 199. |
| City and Regional Planning. All undergraduate courses. | Latin. All undergraduate courses. |
| Classics. All undergraduate courses. | Linguistics. All undergraduate courses. |
| Comparative Literature. All undergraduate courses. | Mathematics. All undergraduate courses except 107, 142A, 142B, 142C, 142D, 144. |
| Decorative Art. All undergraduate courses. | Music. All undergraduate courses; a total of not more than 8 units from the following courses will be accepted as Letters and Science credit: 43, 48, 143, 148. |
| Dramatic Art. All undergraduate courses except 190, 191, 192, 193. | Near Eastern Languages. All undergraduate courses. |
| Economics. All undergraduate courses. | Optometry (see Physiological Optics, below). |
| Education 108, 110 and not more than 3 units from 101, 102, 105. | Oriental Languages. All undergraduate courses. |
| English. All undergraduate courses. | Paleontology. All undergraduate courses. |
| | Philosophy. All undergraduate courses. |
| | Physical Education 105. |

- Physics. All undergraduate courses except 125, 128, 128L, 131.
- Physiological Optics 105A, 105B, 106A, 106B.
- Physiology. All undergraduate courses.
- Plant Biochemistry 123.
- Plant Nutrition 115, 117.
- Political Science. All undergraduate courses except 183.
- Psychology. All undergraduate courses except 3, 104, 114, 116, 117, 180, 185, 186.
- Public Health 5A, 5B, 35, 106, 160A, 160B, 163.
- Sanskrit. All undergraduate courses.
- Scandinavian. All undergraduate courses.
- Slavic Languages and Literatures. All undergraduate courses.
- Social Welfare 100, 106, 110A, 110B.
- Sociology and Social Institutions. All undergraduate courses.
- Soil Science 110, 111, 112, 113, 114.
- Spanish and Portuguese. All undergraduate courses.
- Speech. All undergraduate courses.
- Zoölogy. All undergraduate courses except 109, 116, 119A-119B, 120A-120B, 145.

**COURSES OF INSTRUCTION* OFFERED IN THE
DEPARTMENTS AT BERKELEY
FOR FALL AND SPRING SEMESTERS
ACADEMIC YEAR 1953-1954**

Explanatory Note

THE CREDIT VALUE of each course in semester units is indicated for each semester by a number in parentheses following the title. A semester unit is one hour of the student's time at the University, weekly, during one semester, in lecture, or recitation, together with the time necessary in preparation therefor; or a longer time in laboratory or other exercises not requiring preparation. The session in which the course is given is shown as follows: I, first semester (September to January); II, second semester (February to June); Yr., throughout the first and second semesters. Information concerning class hours will be found in the SCHEDULE AND DIRECTORY.

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

Classification and Numbering of Courses—

Courses are classified and numbered as follows:

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

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

Special study courses for individual advanced undergraduates, usually numbered 199, should be restricted to senior honor students having an adequate background in the subject proposed for special study. This would normally require a sound background in upper division courses in the field of 199 course study.

The maximum number of units per student in any and all 199 courses in any one semester shall be limited to five.

Departments may offer special *honors courses* (marked H) in reading and research, with credit to be determined by the instructors in charge, according to the performance of the individual students, subject to such general restrictions as may be imposed by the department, the College, or the Committee on

* For information concerning general University requirements for degrees and major requirements of colleges and schools at Berkeley, see the CIRCULAR OF INFORMATION.

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.

AGRICULTURAL CHEMISTRY

GRADUATE COURSE

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

The Staff (including all members of the Graduate Agricultural Chemistry Group)†

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

AGRICULTURAL ECONOMICS

(Department Office, 207 Giannini Hall)

Richard L. Adams, M.S., D.Sc. (hon. c.), *Professor of Farm Management.*

Murray R. Benedict, Ph.D., *Professor of Agricultural Economics.*

Raymond G. Bressler, Jr., Ph.D., *Professor of Agricultural Economics (Chairman of the Department), Director of the Giannini Foundation.*

² Sidney S. Hoos, Ph.D., *Professor of Agricultural Economics.*

George M. Kuznets, Ph.D., *Professor of Agricultural Economics.*

George L. Mehren, Ph.D., *Professor of Agricultural Economics.*

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

Siegfried V. Wantrup, D.Agr., *Professor of Agricultural Economics.*

David Weeks, Ph.D., *Professor of Agricultural Economics.*

Harry R. Wellman, Ph.D., *Professor of Agricultural Economics.*

Henry E. Erdman, Ph.D., *Professor of Agricultural Economics, Emeritus.*

Varden Fuller, Ph.D., *Associate Professor of Agricultural Economics.*

Trimble R. Hedges, Ph.D., *Associate Professor of Agriculture, Davis.*

David A. Clarke, Ph.D., *Assistant Professor of Agricultural Economics.*

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



Paul S. Taylor, Ph.D., *Professor of Economics.*

Guy Black, S.B., *Lecturer in Agricultural Economics.*

James B. Hassler, Ph.D., *Lecturer in Agricultural Economics.*

Letters and Science List.—Courses 112A-112B, 120 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Fuller and Mr. Clarke.

Preparation for the Major.—See page 87 of the CIRCULAR OF INFORMATION.

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

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

² In residence spring semester only, 1953-1954.

College of Agriculture may be recommended for honors on the basis of the quality of the work done in the regular curriculum.

Graduate Work.—Concerning conditions for admission to graduate courses see page 10 of this bulletin. Students who intend to become candidates for higher degrees in the College of Agriculture will be required to give evidence of the completion of an amount of work equivalent, in its value, to that required by the College of Agriculture for the degree of Bachelor of Science. The student is referred to the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, for details of graduate work in the various fields of agriculture.

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

UPPER DIVISION COURSES

- 100A. Economic Analysis in Agriculture. (3) I. Mr. Hassler
Prerequisite: Economics 1A-1B, 2.
The application of economic principles to problems of agriculture: economic structure and aspects of American agriculture; analysis of demand, supply, production of agricultural products, with particular reference to the individual firm.
- 100B. Economic Analysis in Agriculture. (3) II. Mr. Mehren
Prerequisite: course 100A.
The application of economic principles to the problems of agriculture: economic pricing of agricultural output and productive services, including multiple products, multiple markets and multiple time periods; regional specialization, location and trade; determinants of economic change; effects of economic organization.
106. Analysis of Agricultural Economic Data. (3) I. Mr. Hassler
Prerequisite: Economics 2, Mathematics 11A-11B or equivalent courses, or consent of instructor.
Evaluation and treatment of economic data in agriculture with emphasis on methods of analyzing relations between economic variables.
110. Agricultural Finance. (3) I. Mr. Black
Prerequisite: Economics 1A-1B.
Farmers' credit needs, methods of financing the agricultural industry, and the agencies supplying agricultural credit.
- 112A-112B. Rural Sociology. (2-2) Yr. Mr. Taylor
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.
120. Agricultural Policy. (3) II. Mr. Benedict
Prerequisite: Economics 1A-1B.
The evolution of agricultural policy in the United States. Historical and analytical treatment of principal farmer movements, legislative provisions for the betterment of agriculture, and current policy problems.
130. Agricultural Marketing. (3) I. Mr. Clarke
Prerequisite: Economics 1A.
Survey of determinants of agricultural markets and trade. Organization and operation of agricultural markets. Coöperative marketing. Costs of marketing. Government in marketing. Changes in agricultural markets and marketing.

140. Farm Management. (3) I. Mr. Shultis
 Survey of farm management: nature of the farm and the problems and methodology of farm management; organization aspects of the individual farm unit; administration of the farm business.
145. Land Economics and Farm Appraisal. (3) II. Mr. Weeks
 (Formerly numbered 102.)
 Prerequisite: Economics 1A-1B.
 The utilization of agricultural land, economic rent, land appraisal, political and economic problems of land development, land settlement, land policies. The relation of population growth to economic utilization of land and to land value.
156. Agricultural Economic Measurements. (3) II. Mr. Lee
 (Formerly numbered 105.)
 Prerequisite: course 106.
 Sources, collection of data, and analysis of selected measurements including parity prices, parity income, employment, wages, production and national income.
- 160A. Economics of Agricultural Marketing. (3) I. Mr. Clarke
 Prerequisite: courses 100A-100B, 106, 130.
 An analytical treatment of agricultural marketing; the marketing firm in its economic context; the theory of interregional trade; economic analysis of market organization.
- 160B. Economics of Agricultural Marketing. (3) II. Mr. Hoos
 Prerequisite: course 160A.
 An analytical treatment of agricultural marketing: collective marketing; government in marketing; the marketing system and the general economy.
- *163. Coöperative Management. (3) I. _____
 (Formerly numbered 122.)
 Prerequisite: Business Administration 1A, course 130.
 Analysis of organizational and operational problems and policies of agricultural coöperative associations.
- 170A. Economics of Farm Management. (3) I. Mr. Hedges
 (Formerly numbered 118.)
 Prerequisite: courses 100A-100B, 106, 140.
 An analytical treatment of farm management: farm organization; management costs and returns; combination of resources in farm management and principles of enterprise combination; problems and principles of size; measures and analyses of earnings. Valuation and purchase.
- *170B. Economics of Farm Management. (3) II. _____
 (Formerly numbered 119.)
 Prerequisite: course 170A.
 An analytical treatment of farm management: farm administration and management; tenure; capital structure; market influences; financial analysis; relation of nonfarm influences to farm management.
175. Economics of Land Utilization. (3) II. Mr. Weeks
 Prerequisite: courses 145, 170A.
 An analytical treatment of land utilization; economic productivity of land; land rents and distribution theory; utilization patterns, margins, and determinants of intensities and types of use; conservation of natural resources; land valuation; relation of land use to population; national land policy.

* Not to be given, 1953-1954.

180. Economics of Agricultural Policy. (3) II. Mr. Fuller
Prerequisite: courses 100A-100B, 120.
An analytical treatment of agricultural policy; economic appraisal of types of policies and policy problems; production, marketing and price; land, credit; markets, relations to national economic policy.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Fuller in charge)
Prerequisite: senior standing and approval of the Department. Limited to agricultural economics majors.

GRADUATE COURSES

202. Seminar in Agricultural Policy. (2) II. Mr. Fuller
A study of public and semipublic activities pertaining to agriculture as an industry.
203. Research in Agricultural Economics. (1-6) I and II.
The Staff (Mr. Bressler in charge)
- 204A-204B. Analytical Methods in Agricultural Economics. (3-3) Yr.
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. Mehren
An analysis of the economic effects of state and federal activity in the marketing of agricultural products.
- 206A. Economics of Agricultural Production. (3) I. Mr. Bressler
A detailed study of the basic principles of the economics of production.
- 206B. Economics of Agricultural Production. (3) II. Mr. Benedict
The application of economic principles to problems of production adjustment.
207. Advanced Land Economics. (2) I. Mr. Weeks
Land policies, planning, rent, tenure, appraisal, development, and utilization.
208. Seminar in the Conservation of Natural Resources. (2) II.
Mr. Wantrup
The economic and social aspects of the conservation of natural resources in the United States and foreign countries, with particular reference to agriculture.
209. Seminar in Agricultural Market Organization. (3) I. Mr. Bressler
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) I. Mr. Hedges
An analysis of economic factors, trends, and relationships which bear upon farm organization and administration; farm management techniques.
299. Special Study for Graduate Students. (1-4) I and II.
The Staff (Mr. Bressler in charge)
Any properly qualified graduate student who wishes to pursue a special field of study may do so if his proposed program is acceptable to the member of the staff with whom he works.

AGRICULTURAL ENGINEERING

(Department Office, 101 Giannini Hall)

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



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

LOWER DIVISION COURSE

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

Mr. Bainer, Mr. Kelly

The development and the application and use of farm machinery; the utilization of power on the farm; elements of hydrology in relation to agricultural engineering; the economics of farm buildings; elementary problems in the mechanics of agriculture.

AGRONOMY

(Department Office, 101 Giannini Hall)

Maurice L. Peterson, Ph.D., *Associate Professor of Agronomy (Chairman of the Department)*, Davis.

Duane S. Mikkelsen, Ph.D., *Assistant Professor of Agronomy*, Davis.

LOWER DIVISION COURSE

*1. Introduction to Agronomy. (3) I.

Mr. Mikkelsen

Principles and practices of field-crop production and soil management; a survey of the production and uses of field crops including pastures and other forages, cereals, edible legumes, oil, fiber, sugar, and green manure crops.

Given in the fall semester of even-numbered years.

AIR SCIENCE AND TACTICS

(Department Office, 222 Building T-9)

George H. Steel, Colonel, U.S.A.F.; *Professor of Air Science and Tactics (Chairman of the Department)*.

Roger B. Files, Lieutenant Colonel, U.S.A.F., *Associate Professor of Air Science and Tactics*.

William E. Mullin, Lieutenant Colonel, U.S.A.F., *Associate Professor of Air Science and Tactics*.

Carl J. Roeser, Major, U.S.A.F., *Associate Professor of Air Science and Tactics*.

George W. Barnes, Jr., Captain, U.S.A.F.; *Assistant Professor of Air Science and Tactics*.

Alan H. Conklin, Captain, U.S.A.F.; *Assistant Professor of Air Science and Tactics*.

Samuel H. Lyons, 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*.

Edwin G. Triner, Captain, U.S.A.F.; *Assistant Professor of Air Science and Tactics*.

* Not to be given, 1953-1954.

LOWER DIVISION COURSES

The lower division or basic courses in Air Science meet the requirements established by the Regents for military training in the first and second undergraduate years. Enrollment in Air Science is limited to students who are male citizens of the United States apparently physically fit for military service and less than 23 years of age at time of initial enrollment. Students apparently physically qualified for and desirous of air crew training will be given preference in selection. The Air Science Basic course consists of 3 hours of formal instruction per week for 2 academic years. Uniforms and textbooks as required are provided by the government, and must be returned in good condition on completion of the course.

1A. Air Science I. (2) I and II. The Staff (Mr. Newsom in charge)
Introduction to A.F.R.O.T.C. program; introduction to aviation, including basic principles of flight; fundamentals of global geography to include evolution of geographical knowledge, geographical basis of power and military aspects of global geography; and basic military training.

1B. Air Science I. (2) I and II. The Staff (Mr. Newsom in charge)
Prerequisite: course 1A.
International tensions and security structures and the role of the United States in world leadership; instruments of national military security, including the place of air power in modern war; and basic military training.

21A. Air Science II. (2) I and II. The Staff (Mr. Roeser in charge)
Prerequisite: courses 1A and 1B, or their equivalent.
Elements of aerial warfare, including identification of military aircraft; study of the various types of aerial weapons; study of types and designs of delivery aircraft; and leadership laboratory for cadet non-commissioned officers' training.

21B. Air Science II. (2) I and II. The Staff (Mr. Roeser in charge)
Prerequisite: course 21A, or its equivalent.
The air as a medium for delivery of weapons and problems associated therewith; the air base as an operational site; combat and support organizations of the U.S.A.F.; Air Force officer careers; leadership laboratory for cadet noncommissioned officers.

UPPER DIVISION COURSES

Commencing with the fall semester, 1953, a new generalized course of instruction will be offered in lieu of the specialized career options previously given. This new course is designed primarily to develop the student as a potential junior officer of the United States Air Force.

Students who have successfully completed the basic courses or have received credit in lieu thereof may apply for enrollment in the advanced course in Air Science. In general, students selected for this course are those who have shown potentials for leadership and command, whose aptitude and growth potential insures their development into efficient officer material and whose interest in becoming Air Force officers has been demonstrated. The advanced course consists of five hours of formal instruction per week for two academic years, but the student may expect that at least two additional hours per week will be required for extra activities not specifically covered in the formal program but essential in his over-all development as an officer. The number selected for enrollment in the advanced course may vary from year to year and is dependent upon the quota allocated annually and the requirements of the United States Air Force for officers in various

career fields. For admission to the upper division or advanced courses of Air Science, students must:

1. Be citizens of the United States and be regularly enrolled in the University of California.
2. Not have reached 25 years of age at the time of initial enrollment in the advanced course.
3. Be selected by the Professor of Air Science and 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; to accept a commission, if tendered, to serve on active duty for a period of not less than two years after receipt of such commission, subject to call by the Secretary of the Air Force and to remain a member of a Regular or Reserve component of the Air Force until the eighth anniversary of the receipt of such commission.
6. Pass successfully a prescribed physical examination.

Students intending to apply for air crew training (either pilot or observer) upon obtaining their commissions must meet the following additional requirements:

1. Be not more than 26½ years of age at anticipated date of graduation and commissioning.
2. Agree to participate in flight training portion of the course of instruction if any when offered.
3. Agree to accept an in-grade appointment to an Air Force Flight Training School subsequent to 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.

Students are required to attend a summer camp, normally of six weeks' duration, during the summer between their junior and senior years. Students attending this advanced summer camp will receive pay while in attendance at the rate of approximately \$75 per month, transportation allowance to and from camp, quarters, clothing, uniforms, meals, and medical service while at camp.

At the beginning of the advanced course (junior year), an officer-type uniform is furnished each student, which becomes his personal property upon his successful completion of the advanced course. During this two-year period, each student receives a monthly monetary allowance at a daily rate equal to the value of the commuted ration as announced by the Department of the Air Force (current rate is 90¢ per day.) The acceptance by the student of any of the monetary allowances listed above will make the completion of the advanced course a prerequisite to graduating from the University.

Any pay or allowances mentioned above are in addition to benefits received through the provisions of Public Law 346, providing the ceiling as limited by law on total income is not exceeded.

Successful completion of the advanced Air Force R.O.T.C. course and four years of education leading to the granting of a baccalaureate degree, qualify the student for appointment and commission by the President of the United States as a Second Lieutenant in the Air Force Reserve.

For further information about the Air Force Reserve Officers' Training Corps, consult the Professor of Air Science and Tactics, Room 214, Building T-9, Berkeley.

- 131A. Air Science III. (3) I. The Staff (Mr. Files in charge)
Prerequisite: courses 21A and 21B, or their equivalent.
The Air Force commander and his staff; problem-solving techniques; communications media within the Air Force, emphasizing military correspondence, the communications process and teaching methods; military law, courts and boards; leadership laboratory for cadet officers.
- *131B. Air Science III. (3) II. The Staff (Mr. Files in charge)
Prerequisite: course 131A, or its equivalent.
Applied air science, including aerodynamics and propulsion, aerial navigation and basic meteorology; air base organization and functions; leadership laboratory for cadet officers.
- 131C. Air Science III. (3) II. Mr. Files, Mr. Triner
Prerequisite: courses 21A and 21B, or their equivalent.
Elements of aerial warfare, including aerial targets, weapons, delivery aircraft, the air ocean, air bases, and organizations of the U.S.A.F.; careers of an Air Force officer; leadership laboratory for cadet officers.
- 141A. Air Science IV. (3) I. The Staff (Mr. Mullin in charge)
Prerequisite: courses 131A and 131B or their equivalent.
Subjects to be given during the academic year 1953-1954 will be selected from the new generalized course of instruction as considered most suitable in rounding out the over-all training of the student as an officer of the Air Force.
- 141B. Air Science IV. (3) II. The Staff (Mr. Mullin in charge)
Prerequisite: course 141A, or its equivalent.
Subjects to be given during the academic year 1953-1954 will be selected from the new generalized course of instruction as considered most suitable in rounding out the over-all training of the student as an officer of the Air Force.

ANATOMY

A Department of the School of Medicine

(Department Office, 4549 Life Sciences Building)

- Herbert McLean Evans, B.S., M.D., D.med. h.c. (Freiburg i.B., Santiago), Docteur h.c. (San Marcos, Paris), D.Sc. (Birmingham), *Professor of Anatomy, Morris Herstein Professor of Biology, and Director of the Institute of Experimental Biology, Emeritus.*
- William R. Lyons, Ph.D., M.D., *Professor of Anatomy.*
- William O. Reinhardt, A.B., M.D., *Professor of Anatomy (Vice-Chairman of the Department).*
- John B. deC. M. Saunders, M.B., Ch.B., F.R.C.S. (Edin.), *Professor of Anatomy and Lecturer in Medical History and Bibliography (Chairman of the Department of Anatomy).*
- Miriam E. Simpson, Ph.D., M.D., Docteur h.c. (Aix-Marseille), *Professor of Anatomy and Acting Director of the Institute of Experimental Biology.*
- †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.*

* Not to be given, 1953-1954.

† Absent on leave, 1953-1954.

Ian W. Monie, M.B., Ch.B. (Glas.), *Assistant Professor of Anatomy.*
 Bill C. Garoutte, M.D., *Instructor in Anatomy.*



Ralph L. Hawkins, M.D., *Lecturer in Anatomy.*

Letters and Science List.—All undergraduate courses in anatomy are included in the Letters and Science List of Courses. For further information concerning this list, see page 7.

UPPER DIVISION COURSES

101. Histology and Microscopic Organology. (6) I.
 Miss Simpson in charge, 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
 Lectures and laboratory.
 Prerequisite: Zoölogy 1A or Physiology 1, 1L. Enrollment limited to two hundred students.
 Demonstration and laboratory study of prepared human dissections, models, and microscopic slides. Not open to freshmen or to premedical or pre dental students.
103. Neuroanatomy. (4) I.
 Mr. Saunders in charge, Mr. Hawkins, Mr. Garoutte
 Lectures and laboratory. Enrollment limited to twelve students.
105. Systematic Human Anatomy. (5) I.
 Mr. Reinhardt in charge, Mr. Monie, Mr. Saunders
 Lectures. Prescribed for students in the first year of the School of Medicine. Enrollment limited. Course 105X must be taken concurrently.
- 105X. Systematic Human Anatomy (Laboratory). (6) I.
 Mr. Reinhardt in charge, Mr. Monie
 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. Reinhardt and Mr. Saunders in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

209. Human Embryology. I and II. Mr. Monie
 Credit to be arranged.
 Opportunity is offered for the study of specific problems in human embryology. Open only to students familiar with vertebrate embryology.
210. Physiological Anatomy of Reproduction. (2) I and II. Miss Simpson
 Two hours weekly.
 Informal conferences and demonstrations. Outside reading required.
211. Haematology. I and II. Miss Simpson
 Credit to be arranged.

212. *Dynamic Morphology, I and II.* Mr. Saunders
Hours and credit to be arranged.
Laboratory work, special reading, and informal conferences.
213. *Original Investigation, I and II.*
The Staff (Mr. Reinhardt 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

(Department Office, 202 Building T-2)

Edward W. Gifford, *Professor of Anthropology and Director of the Museum of Anthropology.*

Theodore D. McCown, Ph.D., *Professor of Anthropology (Chairman of the Department) and Curator of the Museum of Anthropology.*

David G. Mandelbaum, Ph.D., *Professor of Anthropology.*

Ronald L. Olson, Ph.D., *Professor of Anthropology.*

A. L. Kroeber, Ph.D., Sc.D., L.H.D., LL.D., *Professor of Anthropology, Emeritus, and Director of the Museum of Anthropology, Emeritus.*

Robert H. Lowie, Ph.D., 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 Associate Curator of South American Archaeology.*



Darrell A. Amyx, Ph.D., *Associate Curator of Ancient Mediterranean Art and Associate Professor of Art.*

Anna Hadwick Gayton (Anna Hadwick Gayton Spier), Ph.D., *Associate Professor of Decorative Art and Associate Curator of Textiles, Museum of Anthropology.*

George A. Pettitt, Ph.D., *Lecturer in Anthropology.*

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

Winfield S. Wellington, M.A., Gr.Arch., *Associate Curator of Art, Museum of Anthropology, Director of the Art Gallery, and Professor of Decorative Art.*

Letters and Science List.—All undergraduate courses in anthropology are included in the Letters and Science List of Courses. For further information concerning this list, see page 7.

Departmental Major Adviser: Mr. Rowe.

Preparation for the Major.—Required: Anthropology 1, 2A-2B (10). Recommended: Geography 2, History 4A-4B; Oriental Languages 42; Sociology and Social Institutions 1, 2; 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 197; Decorative Art 127, 175A, 193A; Geography 121A–121B, 122A–122B, 161; German 125; Linguistics 100, 130, 140, 145, 170, 190A–190B; Near Eastern Languages 100A–100B; Oriental Languages 142; Paleontology 126; Philosophy 108, 147; Psychology 141, 145; Public Health 160A; Sociology and Social Institutions 141A–141B, 166, 167; Zoölogy 114, 115.

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

LOWER DIVISION COURSES

1. General Anthropology: Physical and Biological Factors. (4) I and II.
Lectures and two section meetings a week. Mr. Heizer, Mr. McCown
Human biology in terms of human evolution, fossil man, races, race differences, and problems.
- 2A–2B. General Anthropology: Cultural Factors. (3–3) Yr.
Lectures and one section meeting a week. Mr. 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.
115. Peoples of the Philippines and Indonesia. (3) II. Mr. Gifford
Geography, races, populations, cultures, and development of the Philippines, as part of the larger Indonesian sphere of world history.
- 118A–118B. The Nature of Culture. (3–3) Yr. Mr. Mandelbaum, ———
118A. The general structure and basic processes of cultural behavior; illustrative materials from primitive societies and modern civilizations.

* Not to be given, 1953–1954.

- 118B. The dynamics of cultural life; analysis of life history materials and contemporary events. Mr. Mandelbaum.
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. Mandelbaum
Comparative survey of religion and magic.
- 125A-125B. Comparative Society. (3-3) Yr. Mr. Olson
The development of human society, with emphasis on the growth of modern institutions out of primitive kinship, social, and territorial units.
Either half of the course may be taken independently.
- *126. Invention and Technology. (3) II. Mr. Gifford
Psychology of invention; origin, history, and spread of fundamental inventions; illustrative material from the Museum of Anthropology.
- *137. Indians of California. (3) II. Mr. Heizer
Origin and relationships of the natives; prehistoric remains; shell mounds. Tribal divisions; arts; customs; industry; beliefs.
- *139. Africa. (3) I. Mr. Gifford
Races; Egyptian, Mediterranean, and Negro cultures, past and present; native achievement; Asiatic relations and influences.
141. Mexico and Central America. (3) I. Mr. Olson
Achievements of the Aztecs, Mayas, and their predecessors.
142. Peoples of the Andes. (3) II. Mr. Rowe
Culture of the Incas of Peru and of other Andean peoples.
- 143A-143B. Peoples of India. (3-3) Yr. Mr. Mandelbaum
Prerequisite: courses 1, 2A-2B, or junior standing.
A survey of the principal culture groups of India. Problems of the primitive tribes, village life, religious affiliations, caste structure, and their relation to the contemporary scene in India.
- *145. Peoples of Southeast Asia. (3) I. _____
Peoples and cultures of Burma, Thailand, Indo-China and Malaya; survey and analysis of significant population groups and of the social factors operating in these countries.
- *147. Peoples and Cultures of the Pacific Islands. (3) II. Mr. Gifford
Oceanian races and cultures; indigenous origins; Asiatic relations and influences.
- *150A-150B. Physical Anthropology. (3-3) Yr. Mr. McCown
Lecture and laboratory. Prerequisite: course 1.
Evolutionary development of man; anthropometry; analysis of data; criteria of race. Enrollment limited to twelve students; primarily for major students in anthropology and the medical sciences.
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. (3) II. Mr. Pettitt
 Methods and problems in the transmission of culture from generation to generation.
195. Field Course in Archaeological Method. (2) II. Mr. Heizer
 Lectures, museum preparation, and week-end excavations.
 Enrollment limited to eighteen students, admitted by consent of the instructor. With the consent of the instructor, may be repeated without duplication of credit.
- *196. Archaeological Method. (2) I. Mr. Heizer
 Prerequisite: course 195 and consent of 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).
 The Ancient Near East (Near Eastern Languages 100A-100B).
 Civilizations of Eastern Asia (Oriental Languages 142).
 Oriental Societies (Sociology and Social Institutions 166).
 Nomadic Societies (Sociology and Social Institutions 167).
 Social Philosophy (Philosophy 108).
 Theories of Historical Inquiry (Philosophy 147).
 Personality in Society and Culture (Psychology 141).
 Social Psychology (Psychology 145).
 History of Western Social Organization (Sociology and Social Institutions 141A-141B).
 Introduction to General Linguistics (Linguistics 100).
 Phonetics and Phonemics (Linguistics 130).
 American Indian Languages (Linguistics 170).
 Types of Linguistic Structure (Oriental Languages 177).
 Linguistics Laboratory (Linguistics 190A-190B).
 Geography of Eastern North America (Geography 121A).
 Geography of Western North America (Geography 121B).
 Geography of Middle America (Geography 122A).
 Geography of South America (Geography 122B).
 Geography of Domesticated Plants and Animals (Geography 161).
 Primitive Art (Decorative Art 127).
 Primitive and Folk Textiles (Decorative Art 175A).
 Historic Costume (Decorative Art 193A).
 Introduction to Folklore (German 125).

* Not to be given, 1953-1954.

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 10)

206. Proseminar. (2) I and II. Mr. McCown, Mr. Heizer
Introduction to research. For new graduate students in anthropology.
- 207A-207B. History and Theory of Anthropology. (2-2) Yr. Mr. Olson
Prerequisite: course 206.
- *209A-209B. Culture Problems of Eurasia and North America. (2-2) Yr.
Prerequisite: course 206. Mr. Olson
- *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.
- *218H. Culture and Personality: the Psychological Approaches. (2) II.
Mr. Mandelbaum
235. Problems in the Culture History of South America. (2) I. Mr. Rowe
Prerequisite: course 206.
237. Culture Problems of Western North America. (2) I. Mr. Heizer
Prerequisite: course 206.
Work on problems of tribal distribution and cultures.
- 243A-243B. Culture Problems of India. (2-2) Yr. Mr. Mandelbaum
Prerequisite: course 206 or consent of the instructor.
245. Culture Problems of Southeast Asia. (2) II. _____
Prerequisite: course 206.
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.

* Not to be given, 1953-1954.

- *253. Concepts and Problems in Physical Anthropology. (2) II.
 Prerequisite: course 206. 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.
- *290. Problems in the Culture History of Meso-America. (2) II. ———
299. Directed Research. (2-6) I and II. The Staff (Mr. McCown in charge)

MUSEUM OF ANTHROPOLOGY

The Museum of Anthropology, organized in 1901 with the Phoebe A. Hearst collections as nucleus, is in storage in six buildings on the campus. Major parts of the collections are in the temporary Anthropology Museum building, where special exhibits are occasionally arranged in connection with courses of instruction. The contents include 109,000 inventoried artifacts from native California, 61,000 from other parts of the New World, 43,000 from the Old World, 8,000 skeletal items, 17,000 photographs, paintings, and drawings, 2,700 photograph records. The collections are available for study by scholars and advanced graduate students. Those interested in the Museum's facilities may address the Director, Mr. E. W. Gifford.

ARCHITECTURE

(Department Office, 1 Architecture Building)

- Ernest Born, M.A., *Professor of Architecture.*
 Vernon A. DeMars, A.B., *Professor of Architecture.*
 Michael A. Goodman, M.A., *Professor of Architecture.*
 Raymond W. Jeans, M.A., *Professor of Architecture.*
 Stafford L. Jory, Gr.Arch., *Professor of Architecture.*
 Howard Moise, B.S., M.Arch., *Professor of Architecture.*
 Warren C. Perry, B.S., F.A.I.A., *Professor of Architecture.*
 Jacques Schnier, M.A., *Professor of Sculptural Design.*
 William W. Wurster, A.B., *Professor of Architecture (Chairman of the Department).*
 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.*
 George P. Simonds, M.A., *Associate Professor of Architecture.*
 Harold A. Stump, A.B., *Associate Professor of Architecture.*
 James S. Ackerman, Ph.D., *Assistant Professor of Art and Architecture.*
 Kenneth H. Cardwell, A.B., *Assistant Professor of Architecture.*
 Henry J. Lagorio, M.A., *Assistant Professor of Architecture.*

* Not to be given, 1953-1954.

Stefan A. Novak, M.A., *Assistant Professor of Sculptural Design.*
 *Richard O'Hanlon, *Assistant Professor of Sculptural Design.*
 John G. Rauma, M.Arch., *Instructor in Architecture.*



Scott Beamer, B.S., *Lecturer in Architectural Mechanics.*
 Eugene E. Crawford, B.Arch., *Lecturer in Architecture.*
 Joseph Esherick, B.Arch., *Lecturer in Architecture.*
 G. L. Gendler, B.M.E., *Lecturer in Architectural Mechanics.*
 Jack P. Hillmer, B.Arch., *Lecturer in Architecture.*
 Eric Mendelsohn, M.A., *Lecturer in Architecture.*
 Leonard Michaels, M.A., *Lecturer in Architecture.*
 Joseph P. Milano, A.B., *Lecturer in Architectural Mechanics.*
 Karl V. Steinbrugge, B.S., *Lecturer in Structural Design.*
 Lester Clark Winter, M.F.A., *Visiting Assistant Professor of Sculpture.*

Letters and Science List.—Courses 5A, 5B, 5C, 5D, 14A, 14B, 113A, 113B, 114A, 114B, 117, 146, 148A, and 148B are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

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, 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. _____
 Six hours weekly. Lecture and drafting practice.
 Study of architectural forms and composition.
2. Architectural Drawing: Descriptive Geometry. (3) I and II. Mr. Cardwell, Mr. Lagorio
 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. Cardwell, Mr. Lagorio
 Six hours weekly. Lecture and drafting practice.
 Prerequisite: course 1 and 2.
4. Elementary Design and Theory. (4) I and II. Mr. Moïse, Mr. Crawford
 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.

* Absent on leave, 1953-1954.

- 6A. Classwork in Ancient and Classic Architecture. (1) II.
Mr. Simonds, Mr. Stump
- 6B. Classwork in Medieval Architecture. (1) I. Mr. Stump, Mr. Simonds
- 6C. Classwork in Renaissance Architecture. (1) I.
Mr. Perry, Mr. Simonds, Mr. Stump
- 6D. Classwork in Modern Architecture and the Allied Arts. (1) II.
Mr. Simonds, Mr. Stump
12. Rendering in Water Color. (1) I and II.
Mr. Czaja, Mr. Downs, Mr. Jory, Mr. Goodman, Mr. Rauma, ——
Three hours weekly. Six sections.
Prerequisite: Art 2A or equivalent.
13. Rendering in Pen and Ink. (1) I and II.
Mr. Goodman, Mr. Jeans, Mr. Lagorio, ——
Three 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. Winter, 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. An introduction to space design and materials with construction in wood, metal and plaster.
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. Perry, Mr. Jory, Mr. Esherick, Mr. Michaels, Mr. Lagorio, Mr. Rauma
Eight hours weekly.
Prerequisite: courses 1, 2, 3, and 4.
- 102A-102B. Design and Theory: Senior Problems. (5-5) Yr. Beginning each semester.
Mr. Born, Mr. Czaja, Mr. Goodman, Mr. Hillmer, Mr. DeMars, Mr. Stump
Eight hours weekly.
Prerequisite: course 101A-101B.
- †102C-102D. Design and Theory. (5-5) Yr. Beginning each semester.
Eight hours weekly. Mr. Born
Prerequisite: course 102A-102B.
- 108A-108B. Architectural Mechanics. (3-3) Yr.
Mr. Milano, Mr. Beamer, Mr. Gendler
Prerequisite: course 4, Physics 2A-2B.
110. The House. (1) I and II. Mr. Jeans, Mr. Goodman
112. Advanced Water-Color Rendering. (1) I and II. Mr. Downs, Mr. Jory
Three hours weekly. Two sections.
Prerequisite: course 12 (1 unit with grade A or B).

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

- 113A-113B. Sculptural Design. (2-2) Yr. Mr. Schnier
 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. Mr. Schnier, Mr. Winter
 Six hours weekly.
 Prerequisite: course 14A-14B, or courses 1 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. Goodman, Mr. Born, Mr. Czaja, Mr. Cardwell, Mr. Rauma, Mr. Stump
 Three hours weekly. Seven sections.
 Prerequisite: Art 2A or equivalent.
117. Introduction to Housing and Planning. (3) I and II. Mr. Moïse
 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. Mr. Winter, Mr. Schnier
 Six hours weekly.
 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)

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 10.)

200. Comprehensive Graduate Problems. (5) I and II. Mr. Jeans, Mr. Simonds
 Twelve hours weekly. A semester problem, including all phases of design, structure, and construction details. Given only in conjunction with course 207.
- 201A. Design and Theory: Graduate Sketch Problems. (1) I and II. Mr. Downs, Mr. Rauma
 Prerequisite: course 102A-102B.
- 201B. Design and Theory: Graduate Problems. (7) I and II. Mr. Mendelsohn, Mr. Downs
 Prerequisite: course 101A-101B and course 102A-102B.

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

- †202. Design and Theory: Advanced Problems and Research. (6) I and II.
Prerequisite: courses 200, 201A–201B, 207. Mr. Wurster
207. Architectural Engineering. (3) I and II. Mr. Steinbrugge, Mr. Stratta
This course is coordinated with course 200 and must be taken with it.
208. Seminar in Architecture. (3) I and II. Mr. Wurster
For candidates for the degree of Master of Arts only.
209. Seminar in Professional Practice. (2) I and II. Mr. Jeans
Prerequisite: course 200, 207 and graduate standing.
A course in specification writing, professional practice, and business relations for candidates for degree of Master of Arts only.
- †298. Special Study for Graduate Students. (2–4) I and II.
By arrangement only. The Staff (Mr. Wurster in charge)

REQUIRED COURSES IN OTHER DEPARTMENTS

General Physics Lectures (Physics 2A–2B).
General Physics Laboratory (Physics 3A–3B).
Introduction to Mathematical Analysis (Mathematics 3A, 3B).
Form (Art 2A).
Strength of Materials (Engineering 18A, 18B; Civil Engineering 108F).
Elements of Framed Structures (Civil Engineering 112, 107E, 107F).
Plane Surveying (Engineering 21).

ART

(Department Office, 107 Spreckels Art Building)

- * John C. Haley, *Professor of Art*.
Walter W. Horn, Ph.D., *Professor of Art*.
J. Ward Lockwood, *Professor of Art*.
Erle Loran, *Professor of Art (Chairman of the Department)*.
Otto J. Maenchen, Ph.D., *Professor of Art*.
Stephen C. Pepper, Ph.D., L.H.D., *Mills Professor of Intellectual and Moral Philosophy and Civil Polity*.
Glenn Wessels, M.A., *Professor of Art*.
Eugen Neuhaus, Ph.D. (hon.c.), *Professor of Art, Emeritus*.
Worth Ryder, *Professor of Art, Emeritus*.
Oliver M. Washburn, A.B., *Professor of the History of Art, Emeritus*.
Darrell A. Amyx, Ph.D., *Associate Professor of Art*.
- * James McCray, M.A., *Associate Professor of Art*.
Kyle Morris, M.F.A., *Associate Professor of Art*.
Chiura Obata, *Associate Professor of Art*.
- ¹ Felix Ruvolo, *Associate Professor of Art*.
James S. Ackerman, Ph.D., *Assistant Professor of Art and Architecture*.
Herschel B. Chipp, M.A., *Acting Assistant Professor of Art*.
- † Karl Kasten, M.A., *Assistant Professor of Art*.



Alfred Frankenstein, Ph.B., *Lecturer in Art for the spring semester*.

¹ In residence fall semester only, 1953–1954.

² In residence spring semester only, 1953–1954.

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

‡ Sabbatical leave in residence, spring semester, 1953–1954.

Letters and Science List.—All undergraduate courses in art are included in the Letters and Science List of Courses. For further information concerning this list, see page 7.

Departmental Major Advisers: Appreciation and Practice of Art: Mr. Morris, Mr. Lockwood; 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 Practice of Art: Architecture 14A–14B. Recommended for prospective majors in History of Art: History 4A–4B.

The Major.—A student may elect a major 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. Haley, Mr. Kasten, Mr. Lockwood, Mr. Loran, Mr. McCray,
Mr. Morris, Mr. Ruvolo, Mr. Ryder, Mr. Wessels
2A: Form in composition using black and white media.
2B: Introduction to color in composition.
- 3A-3B. Intermediate Form and Color. (2-2) Yr. Beginning each semester.
Mr. Haley, Mr. Ruvolo, Mr. Kasten, Mr. McCray
Prerequisite: course 2A-2B.
3A: Color and form in composition.
3B: Form in composition using the human figure as subject.
- *10. An Introduction to Art. (2) I. Mr. McCray
Lectures, illustrated with lantern slides.
The understanding and appreciation of painting, sculpture, architecture, and industrial art. Open to non-majors.
12. Freehand Basic Brushwork in "Sumi" Painting. (2) I and II. Mr. Obata

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) II. 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: I, II.
Course 103A is not prerequisite to 103B.
- 104A-*104B. Advanced Drawing and Painting. (2-2) Yr. Mr. Haley
104A: II.
Course 104A is not prerequisite to 104B.
- 105A-*105B. Advanced Drawing and Painting. (2-2) Yr. Mr. Loran
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
Course 108A is not prerequisite to 108B.
- 109A-*109B. Advanced Drawing and Painting. (2-2) Yr. Mr. Ruvolo
Course 109A is not prerequisite to 109B.

* Not to be given, 1953-1954.

- *110A-110B. Advanced Drawing and Painting. (2-2) Yr. ———
 Course 110A is not prerequisite to 110B.
- 111A-111B. Advanced Drawing and Painting. (2-2) Yr. Mr. Morris
 Course 111A is not prerequisite to 111B.
- 112A-112B. Advanced Drawing and Painting. (2-2) Yr. Beginning each
 semester. Mr. Obata
 Course 112A is not prerequisite to 112B.
- 113A-113B. Advanced Drawing and Painting. (2-2) Yr. Beginning each
 semester. Mr. Wessels
 Course 113A is not prerequisite to 113B.
129. Practice in the Graphic Arts. (2) II. Mr. Kasten

Group B: Theory and Criticism

107. The Human Figure in Art, Past and Present. (2) 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, Mr. Aschenbrenner
 Prerequisite: 6 units of philosophy (at the discretion of the instructor these may be waived for students majoring in literature and the fine arts).

Group C: History of Art and Archaeology

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.

* Not to be given, 1953-1954.

- *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
Prerequisite: upper division standing.
169. History of American Art. (3) II. Mr. Frankenstein
Prerequisite: upper division standing.
- *175A-*175B-175C. Medieval Art. (3-3-3) Mr. Horn
One part is not prerequisite to another.
*175. 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.
- *176A-176B. Italian Renaissance Art. (3-3) Yr. Mr. Ackerman
176A is not prerequisite to 176B.
176A. Italian Art of the Fifteenth Century.
176B. Italian Art of the Sixteenth Century.
178. Baroque Art. (3) II. Mr. Ackerman
180. French Art from 1400 to 1800. (3) I. Mr. Ackerman
- 183A-183B. Modern Art—Emphasis on Painting. (3-3) Yr. Mr. Chipp
183A is not prerequisite to 183B.
183A. Art of the Nineteenth Century.
(Formerly numbered 183.)
183B. Art of the Twentieth Century.
(Formerly offered as 184 in First Summer Session.)

SPECIAL STUDY COURSES

- *190. Proseminar in Medieval Art. (2) II. Mr. Horn
195. Special Study in Practice of Art. (2) I and II. Mr. Loran, Mr. Morris
Prerequisite: 8 units of practice work, or equivalent, taken at another university. Restricted to art majors. May not be repeated for credit.
199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Lockwood in charge)
Prerequisite: senior standing in art, with at least a B average in the major, and approval of the department. Credit gained in course 199 will be accepted in fulfillment of requirements in Groups A, B, or C.

GRADUATE COURSES

- (Concerning conditions for admission to graduate courses, see page 10)
201. Advanced Study and Practice in a Selected Technique. (3) I and II.
I: Mr. Lockwood. Mr. Lockwood, Mr. Loran
II: Mr. Loran.

* Not to be given, 1953-1954.

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. Haley, Mr. Morris, Mr. Ryder, Mr. Wessels
269A: Mr. Ryder, Mr. Wessels.
269B: Mr. Haley, Mr. Morris.
Two hours weekly to be arranged.
Prerequisite: at least a B average in the undergraduate major in art.
Applicants must also demonstrate ability in composition in an examination which will be set at the opening of the semester. If necessary, 269B may precede 269A.
277. Seminar in the History of Renaissance Art. (2) I. Mr. Ackerman
This course may be repeated for credit.
283. Seminar in the History of Modern Art. (2) I and II. Mr. Chipp
This course may be repeated for credit.
285. Seminar in the History of Early Christian and Medieval Art. (2) I and II.
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. Kasten in charge, fall semester;
Mr. McCray in charge, spring semester)
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

(Department Office, 3 Leuschner Observatory)

- Otto Struve, Ph.D., Sc.D., *Professor of Astronomy and Director of the Leuschner Observatory (Chairman of the Department)*.
- R. Tracy Crawford, Ph.D., *Professor of Astronomy, Emeritus, and Director of the Leuschner Observatory, Emeritus*.
- Sturla Einarsson, Ph.D., *Professor of Astronomy, Emeritus, and Director of the Leuschner Observatory, Emeritus*.
- Robert J. Trumpler, Ph.D., *Professor of Astronomy, Emeritus*.
- Leland E. Cunningham, Ph.D., *Associate Professor of Astronomy*.

Louis G. Henyey, Ph.D., *Associate Professor of Astronomy.*
 Harold F. Weaver, Ph.D., *Associate Professor of Astronomy.*
 John G. Phillips, Ph.D., *Assistant Professor of Astronomy.*
 Helen Pillans, Ph.D., *Instructor in Astronomy.*
 Delbert H. McNamara, Ph.D., *Associate in Astronomy.*



C. Donald Shane, Ph.D., *Director of the Lick Observatory and Astronomer.*

Letters and Science List.—All undergraduate courses in astronomy except courses 3 and 11 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Struve, Mr. Weaver.

Preparation for the major: Physics 4A-4B-4C or equivalents; Mathematics 3A-3B, 4A-4B, or equivalents, and a course in statistics; Astronomy 7A-7B; a reading knowledge of French, German, or Russian.

The Major: The major consists of a minimum of 24 units of upper division work in astronomy and allied subjects taken in accordance with a plan approved by the major adviser. Normally, students majoring in astronomy must take courses 104A-104B, 105A-105B, and 117A-117B.

Honors in Astronomy.—Honors are recommended on the basis of excellence of work in the major.

LOWER DIVISION COURSES

1. Introduction to Astronomy. (3) I and II. Mr. Struve
 General facts and principles of the science of astronomy.
 Students who have completed course 1A may not receive full credit for course 1.
 Three lectures and one discussion section weekly.
2. Practice in Observing. (2) I and II. Miss Pillans
 One lecture and three observing hours to be arranged.
 Prerequisite: course 1 and plane trigonometry.
 Elementary work with the equatorial telescope, transit, and sextant; elementary determinations of time, latitude, and longitude, constellation study. Enrollment limited to sixteen students.
- *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
 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.

* Not to be given, 1953-1954.

*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 1 or 7A-7B. Course 105A-105B is recommended and may be taken concurrently.

104A. Precise determination of latitude, time and longitude. Precession, nutation, proper motion and refraction.

104B. Optical properties of a telescope. Differential measurement of star positions.

105A-105B. Theory and Practice of Computing. (3-3) Yr. Mr. Cunningham

Prerequisite: a working knowledge of differential and integral calculus. Interpolation, numerical differentiation, and integration. Solution of equations. Least squares. Astronomical problems.

117A-117B. Introduction to Astrophysics. (3-3) Yr.

Mr. Weaver

A laboratory period will occasionally be substituted for one of the regular periods.

Prerequisite: 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 10)

*205. Utilization of Modern Computing Machinery. (3) I. Mr. Cunningham

Prerequisite: course 105A-105B or equivalent.

Theory and practice of the solution of large astronomical problems with punch-card and electronic calculators.

207A-207B. Physical Foundations of Astrophysics. (3-3) Yr. Mr. Henyey

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.

215A-215B. Orbit Theory and Practice. (3-3) Yr.

Mr. Cunningham

Prerequisite: course 105A-105B or equivalent.

Various orbit methods. Special perturbations. Introduction to general perturbations.

217A-217B. Astrophysics. (3-3) Yr.

Mr. Henyey

Prerequisite: course 117A-117B.

The physics of stellar atmospheres.

*218A-218B. Statistical Astronomy. (3-3) Yr.

Mr. Weaver

An introduction to the principal problems of galactic structure.

*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.

* Not to be given, 1953-1954.

- 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
Introduction to research. For new graduate students in Astronomy.
292. Astrophysics Seminar. (1-3) I and II. Mr. Struve, Mr. Henyey, Mr. Phillips
293. Seminar in Orbits. (1-3) I and II. Mr. Cunningham
294. Seminar in Statistical Astronomy. (1-3) I. Mr. Weaver
298. Advanced Study and Research at Lick Observatory. (1-4) I and II. The Staff (Mr. Shane in charge)
Intended for graduate students who require observational experience as well as for those working upon observational problems for their theses.
299. Advanced Study and Research. (1-4) I and II. The Staff (Mr. Struve in charge)

LICK OBSERVATORY

The Lick Observatory at Mount Hamilton is a separate research department of the University and provides facilities for advanced astronomical work. Graduate students of superior ability are offered the opportunity to work at the Observatory under the direction of the astronomers. In the course of such work, a student may prepare the material for a doctor's or a master's dissertation. For information relating to opportunities for work at the Observatory, interested students should address the Dean of the Graduate Division at Berkeley, or the Director of the Lick Observatory, Mount Hamilton, Santa Clara County, California.

BACTERIOLOGY

(Department Office, 3531 Life Sciences Building)

- Michael Doudoroff, Ph.D., *Professor of Bacteriology.*
Sanford S. Elberg, Ph.D., *Professor of Bacteriology (Chairman of the Department).*
Albert P. Krueger, A.B., M.D., *Professor of Bacteriology and Lecturer in Medicine.*
John H. Northrop, Ph.D., Sc.D., LL.D. (*Member of the Rockefeller Institute for Medical Research*), *Professor of Bacteriology.*
Roger Y. Stanier, Ph.D., *Professor of Bacteriology.*
Edward A. Adelberg, Ph.D., *Assistant Professor of Bacteriology.*
Jacob Fong, Ph.D., *Assistant Professor of Bacteriology.*
Aileen E. Bonestell, M.A., *Associate in Bacteriology.*



- Horace A. Barker, Ph.D., *Professor of Plant Biochemistry.*
Edwin H. Lennette, M.D., Ph.D., *Lecturer in Bacteriology for the spring semester.*
Stewart H. Madin, D.V.M., *Lecturer in Bacteriology.*

Letters and Science List.—All undergraduate courses in bacteriology are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Doudoroff.

Students in the lower division are urged to consult with the major adviser concerning the specific prerequisites to be taken in the lower division as a basis for a major in bacteriology.

Preparation for the Major.—Required: course 1 (in special cases and with prior approval of the adviser, course 2 will be accepted as a substitute, provided this is passed with a grade of B and course 103 or 104 is included in the major program); Chemistry 1A, 1B, 5; 8 or 12; Zoölogy 1A or Botany 1; Physics 2A, 2B. Recommended: elementary courses in French or German; Botany 14; Chemistry 9, and additional courses in both Botany and Zoölogy.

The Major.—All courses in the department must be completed with at least a grade of C, and a grade-point average of 1.0 must be maintained in all courses acceptable for the major. Required: courses 101, and at least 4 units of other upper division courses in the department; Biochemistry 102, or 100A–100B; Biochemistry 101A or Plant Biochemistry 123 (formerly Botany 123); and the balance of 24 units chosen from any of the following: courses 102, 103, 104, 106, 199; Botany 101, 102; Food Technology 116; Chemistry 100, 102, 103, 109; Biochemistry 101B, 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) I.

Lectures and laboratory.

Mr. Doudoroff, Mr. Stanier

Prerequisite: Chemistry 1A and 8; a semester course in botany, zoölogy, or physiology (Botany 1 or 12; Zoölogy 1A or 10; Physiology 1) with at least a grade of C in each course.

A general introduction to microbiology required of students majoring in bacteriology and other students intending to do further work in microbiology. This course is designed also for students in soil microbiology, food technology, biochemistry and related fields.

2. General Bacteriology. (4) II.

Mr. Adelberg

Lectures and laboratory.

Prerequisite: Chemistry 1A.

Designed especially for students who are not majoring in bacteriology.

UPPER DIVISION COURSES

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

101. Advanced Bacteriology. (6) I.

Mr. Elberg, Mr. Fong

Lectures, demonstrations, and laboratory.

Prerequisite: course 1 or 2, Chemistry 8, Zoölogy 1A. Students intending to take this course may save time by arranging for immunization against typhoid and para-typhoid fevers prior to 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 microorganisms; mechanisms of bacterial infection; specific and nonspecific reactions in antimicrobial immunity; the antigen-antibody reaction; nature and serological specificity of antibodies; immuno-chemistry of protein and nonprotein cell substances.

103. Microbial Metabolism. (2) II. Mr. Barker, Mr. Doudoroff, Mr. Adelberg, Mr. Stanier
Prerequisite: course 1 or 2 and Biochemistry 102 or equivalent (Biochemistry 103, Botany 122).
104. Advanced General Microbiology. (4) I. Mr. Stanier, Mr. Doudoroff
Prerequisite: course 1 and Biochemistry 102.
A course designed primarily to acquaint the student with the laboratory techniques necessary for advanced work in general microbiology. Enrollment limited to eight students selected by instructors.
106. Introduction to the Animal Viruses. (2) II. Mr. Fong, Mr. Lennette
Prerequisite: course 101 with a grade of C or better.
An introduction to the animal viruses including the techniques of virology, inclusion bodies, pathogenesis, immunity and virus-host relationship.
- 106C. Laboratory in Virology. (2) II. Mr. Fong
Prerequisite: course 106, completed or in progress, and consent of instructor. Enrollment limited to six students.
A basic course in laboratory techniques for isolation, cultivation and identification of animal and bacterial viruses. Application of these procedures in diagnosis, immunology and pathogenesis of viral diseases. Studies on the nature and reproduction of viruses and the host-virus relationships.
- *107. Microbial Genetics. (2) II.
Prerequisite: any elementary course in bacteriology (Bacteriology 1 or 2 or equivalent) or 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. Beginning each semester. The Staff (Mr. Krueger in charge)
199A is not a prerequisite to 199B.
Study of the recent literature and preparation of a term paper.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Special Study and Research. I and II. The Staff (Mr. Krueger in charge)
Credit according to the work completed.
202. Seminar in Current Research. (1) I and II. The Staff (Mr. Elberg in charge, fall semester; Mr. Stanier in charge, spring semester)
Prerequisite: consent of the instructor.
Presentation of current research projects.
203. Seminar on Microbiological Metabolism. (1) II. Mr. Stanier
204. Seminar in Medical Microbiology. (1) I. Mr. Fong
205. Seminar in Immunology. (1) II. Mr. Elberg
- 206A-206B. Experimental Pathology. (3-3) Yr. Mr. Krueger, Mr. Madin
A study of host reaction to injury.

* Not to be given, 1953-1954.

BIOCHEMISTRY

(Including Departments of the College of Agriculture and the School of Medicine)

(Department Office, 229 Biochemistry and Virus Laboratory)

Hermann O. L. Fischer, Ph.D., *Professor of Biochemistry (Chairman of the Department.)*

Paul L. Kirk, Ph.D., *Professor of Biochemistry and Criminalistics.*

Choh H. Li, Ph.D., *Professor of Biochemistry.*

Wendell M. Stanley, Ph.D., Sc.D., LL.D., Docteur h.c. (Paris), *Professor of Biochemistry and Physiological Chemistry and Director of the Virus Laboratory.*

Robley C. Williams, Ph.D., *Professor of Biophysics.*

C. Arthur Knight, Ph.D., *Associate Professor of Biochemistry.*

Frederick H. Carpenter, Ph.D., *Assistant Professor of Biochemistry.*

Charles A. Dekker, Ph.D., *Assistant Professor of Biochemistry.*

Donald L. MacDonald, Ph.D., *Assistant Professor of Biochemistry.*

John B. Neilands, Ph.D., *Assistant Professor of Biochemistry.*

Arthur B. Pardee, Ph.D., *Assistant Professor of Biochemistry.*

Howard K. Schachman, Ph.D., *Assistant Professor of Biochemistry.*

Robert W. Cowgill, Ph.D., *Instructor in Biochemistry.*



Hamilton H. Anderson, M.D., *Professor of Pharmacology.*

Melvin Calvin, Ph.D., *Professor of Chemistry.*

Department of Plant Biochemistry of the College of Agriculture

(Department Office, 337 Biochemistry and Virus Laboratory)

Horace A. Barker, Ph.D., *Professor of Plant Biochemistry.*

William Z. Hassid, Ph.D., *Professor of Plant Biochemistry.*

Paul K. Stumpf, Ph.D., *Associate Professor of Plant Biochemistry (Chairman of the Department).*

Constant C. Delwiche, Ph.D., *Assistant Professor of Plant Biochemistry.*



Michael Doudoroff, Ph.D., *Professor of Bacteriology.*

Roger Y. Stanier, Ph.D., *Professor of Bacteriology.*

Department of Physiological Chemistry of the School of Medicine

(Department Office, 1557 Life Sciences Building)

Frank W. Allen, Ph.D., *Professor of Biochemistry (Vice-Chairman of the Department).*

David M. Greenberg, Ph.D., *Professor of Biochemistry (Chairman of the Department).*

Edward S. Sundstroem, M.D., *Professor of Biochemistry, Emeritus.*

†Harold Tarver, Ph.D., *Associate Professor of Biochemistry.*

Edward L. Duggan, Ph.D., *Assistant Professor of Biochemistry.*

† Sabbatical leave in residence, spring semester, 1953-1954.

Letters and Science List.—All undergraduate courses in biochemistry are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

The department offers two programs for the major: *Plan I*, a program for students expecting to pursue graduate study in biochemistry, and *Plan II*, a program with emphasis on biochemical laboratory techniques for students who do not expect to continue beyond the Bachelor of Arts degree. Any student who has completed Biochemistry 102 and wishes to become a biochemistry major should consult a biochemistry major adviser regarding an acceptable program.

Departmental Major Advisers.—Mr. Dekker, Mr. Cowgill.

Preparation for the Major.—Plan I. Required: Chemistry 1A–1B, 5, 12, either 112 or 112C, and 109 or preferably 110A–110B (112C and 109 or 110A may be taken concurrently with Biochemistry 100A); Mathematics 3A–3B, 4A; Physics 4A, 4B, 4C; Physiology 1–1L or Zoölogy 1A and one of the following: Bacteriology 1 or 2, Botany 1 or 12, Zoölogy 1B. Recommended: a course in statistics; a reading knowledge of German and one other foreign language.

Plan II. Required: Chemistry 1A–1B, 5, 8, 9, 109; Mathematics 3A–3B or 16A–16B; Physics 2A–2B, 3A–3B; Physiology 1–1L or Zoölogy 1A and one of the following: Bacteriology 1 or 2, Botany 1 or 12, Zoölogy 1B.

High school students should note that the preparation for the major is simplified if their high school programs include chemistry, physics, four years of mathematics, and two years of German. Ordinarily an average of at least 1.0 grade points per unit taken in courses required as preparation for the major is required for admission to the major.

The Major.—*Plan I.* The major must include courses 100A–100B (6), 101A–101B (6), 112 (1) and the balance of the 24 units required for the major chosen from other courses in biochemistry and in allied subjects in accordance with a plan approved by the departmental adviser. Students planning to pursue graduate study in biochemistry should maintain a grade-point average of at least 2.0 in biochemistry courses. The department will certify to the completion of the major program for graduation under Plan I only on the basis of at least a grade-point average of 1.0 in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the major in biochemistry.

Plan II. The major must include courses 100A–100B (6), 101A–101B (6), 110 (5), 112 (1) and the balance of the 24 units required for the major chosen from other courses in biochemistry and in allied subjects in accordance with a plan approved by the departmental adviser. The department will certify to the completion of the major program for graduation under Plan II only on the basis of at least a grade-point average of 1.0 in the upper division courses included in the major. Students who cannot maintain such an average may be required at any time to withdraw from the major in biochemistry.

A major in basic chemistry with emphasis on biochemistry may be taken in the College of Chemistry since course 100A–100B (6) is accepted as a chemistry course in the basic chemistry major.

Honors in Biochemistry.—Honors are recommended for students who maintain a grade-point average of 2.0 or higher. Honor students are given 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. Dekker
Prerequisite: Chemistry 8 and 9 or 12 with a grade of C or higher; Chemistry 109 or 110A (may be taken concurrently), and Physiology 1–1L or Zoölogy 1A (may be taken concurrently), or consent of instructor.

Lectures on the chemical and physical factors concerned in life processes including the chemistry and metabolism of salts, vitamins, hormones, lipids, carbohydrates, and proteins with a survey of nutrition and energy exchange. Designed for biochemistry majors.

- 101A-101B. General Biochemistry Laboratory. (3-3) Yr.
 (Formerly numbered 104.) Mr. Dekker, Mr. Carpenter
 One lecture and two three-hour laboratory periods weekly.
 Prerequisite: course 100A or 102 (may be taken concurrently).
 Laboratory practice with the more important constituents of living matter to illustrate their chemical behavior. The experimental work is planned to accompany the lectures in course 100A-100B.
102. A Brief Survey of the Principles of Biochemistry. (3) I and II.
 Mr. MacDonald, Mr. Delwiche, Mr. Neilands
 Prerequisite: Chemistry 8. Recommended: Chemistry 9, 109 and an introductory course in bacteriology, botany, or zoology.
 A survey of the chemistry of biologically important compounds and their role in animal and plant metabolism with emphasis on plant metabolism in the fall semester and on animal metabolism in the spring semester. Designed for non-biochemistry majors. Not open for credit to students who have credit in course 100A-100B or its equivalent.
107. Quantitative Microchemical Analysis. (4) I. Mr. Kirk
 One lecture and three three-hour laboratory periods weekly.
 Prerequisite: Chemistry 5, 8, and 9, with a grade of C or higher and consent of instructor. Enrollment limited to twenty-five.
 Quantitative estimation of elements and compounds on a micro basis with particular reference to biological materials.
109. Advanced Microchemical Analysis. (2-4) I and II. Mr. Kirk
 Lecture and laboratory.
 Prerequisite: course 107 with a grade of B or higher, or consent of instructor.
 A limited number of students may pursue advanced microchemical techniques and special problems.
112. Proseminar. (1) I and II. The Staff (Mr. Li in charge)
 Prerequisite: courses 100A and 101A.
 Biochemical literature and newer developments of the subject.
180. Research. (3-5) I and II. The Staff (Mr. Dekker in charge)
 Prerequisite: courses 100A and 101A or 101M with a grade of B or higher.
 A limited number of 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. Dekker in charge)
 Reading and conference for properly qualified students under the direction of a member of the staff.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Courses 201 to 212 and 222 represent selected topics in biochemistry and are intended to acquaint advanced students with recent advances made in the different fields of biochemistry. Also open to senior students with honor standing by consent of the instructor.

- *202. Carbohydrates. (2) I. Mr. Fischer
Chemistry and biochemistry of the carbohydrates.
- *203. Biochemistry of the Hormones. (2) II. Mr. Li
Survey of the biochemistry of the hormones.
204. Biochemistry of the Viruses. (2) II. Mr. Knight
Survey of the biochemistry of the viruses.
- 206A-206B. Physical Biochemistry. (2-2) Yr. Mr. Schachman
Prerequisite: Chemistry 12 or 112 or 112C, 110A-110B, Physics 4A, 4B, 4C, Mathematics 4A or consent of instructor. Recommended: course 102 or 100A-100B.
Application of modern physical concepts and experimental methods to the problems of large molecules of biological interest.
- *207. The Mechanism of Drug Action. (2) I. Mr. Anderson
The composition, synthesis, biochemical and pharmacological properties and action of chemical agents that are used in medicine; relation between chemical composition and pharmacological action; principles of chemotherapy.
- *208. The Mechanism of Drug Action Laboratory. (1) I. Mr. Anderson
Prerequisite: course 207 or an equivalent course in pharmacology.
Intended to serve as an introduction to research in the borderline field between biochemistry and pharmacology.
209. Advanced Biochemical Laboratory Methods. (4) II. Mr. Cowgill
One lecture and three three-hour laboratory periods weekly.
Prerequisite: courses 100A-100B, 101A-101B, or 102 and 123 and consent of the instructor.
Experimental techniques used in research including isolations from natural materials, chromatographic analysis and isotopic tracer methods.
210. Fats, Phospholipids, and Related Compounds. (2) I. Mr. Fischer
Chemical constitution, isolation, synthesis, stereochemistry, relation to carbohydrates and the general biological role of these compounds.
211. The Biochemistry of Enzyme Action and Biological Oxidation. (3) I.
Prerequisite: course 102 or 100A-100B. Mr. Neilands, Mr. Stumpf
Classification, sources, methods of purification, physicochemical properties, and mechanism of action of enzymes and their role in metabolic processes.
212. Enzyme Chemistry Laboratory. (3) I. Mr. Pardee
One lecture and two three-hour laboratory periods weekly.
Prerequisite: course 211 (may be taken concurrently), or consent of instructor.
Experimental methods of enzyme chemistry and biological oxidations.
280. Research. (1-9) I and II. The Staff (Mr. Carpenter in charge)
Students must enroll for not less than 4 units, except by special permission of the chairman of the department.
290. Seminar. (1) I and II. The Staff (Mr. Cowgill in charge)

299. Special Study for Graduate Students. (1-3) I and II.

The Staff (Mr. Carpenter in charge)

Reading and conference for properly qualified graduate students under the direction of a member of the staff.

Research Conference. (No credit.) I and II.

The Staff (Mr. Stanley in charge)

Members of the staff and advanced graduate students meet once a week to discuss research problems.

Plant Biochemistry

UPPER DIVISION COURSES

123. Plant Biochemistry Laboratory. (2) I. Mr. Hassid .
 Two three-hour laboratory periods weekly.
 Prerequisite: Biochemistry 102 (may be taken concurrently) and Chemistry 5 and 8.
 Introduction to methods of studying the properties and behavior of plant constituents with special emphasis on quantitative procedures.
- Microbial Metabolism (Bacteriology 103). (2) II.

GRADUATE COURSES

222. Plant Biochemistry. (2) II. Mr. Stumpf
 Prerequisite: Biochemistry 102 or 100A-100B with grade of C or higher, or consent of instructor.
 Lectures on the chemistry of important plant constituents and on processes such as photosynthesis, respiration, and carbohydrate, nitrogen and fat metabolism.
225. Microbial Metabolism Laboratory. (3) II.
 Mr. Barker, Mr. Doudoroff, Mr. Stanier
 One lecture and two three-hour laboratory periods weekly.
 Prerequisite: Biochemistry 101A or Plant Biochemistry 123 and Bacteriology 103 (may be taken concurrently) and consent of instructor.
 Experimental techniques used in research in microbial metabolism including fermentation analysis; manometric, nutritional, and tracer techniques; use of enzyme preparations; and isolation and identification of products of intermediary metabolism.
- 280P. Research. (1-9) I and II.
 Mr. Barker, Mr. Delwiche, Mr. Hassid, Mr. Stumpf
- 290P. Seminar. (1) I and II.
 Mr. Barker, Mr. Delwiche, Mr. Hassid, Mr. Stumpf
 A seminar on plant biochemistry.

Physiological Chemistry

UPPER DIVISION COURSES

- 101M. Medical Biochemistry. (8) II.
 Mr. Greenberg, Mr. Tarver, Mr. Allen, Mr. Duggan
 Four lecture and four three-hour laboratory periods weekly.
 Prescribed for students in the first year of the School of Medicine to fulfill the requirements in biochemistry.
 Lectures on the physicochemical basis of life processes, a survey of the chemical nature of lipids, carbohydrates, proteins, vitamins, and hormones, a discussion of the changes that these substances undergo in the animal body, and a general survey of the field of nutrition and energy exchange.
 Laboratory practice in biochemical procedures including urine and blood analyses.

103. Medical Biochemistry. (4) II. The Staff (Mr. Greenberg in charge)
Prerequisite: Chemistry 5, 8, and 9, or 12A, Zoölogy 1A-1B and consent of instructor.
Equivalent to the lecture part of Biochemistry 101M. Enrollment limited.
110. Advanced Biochemistry. (5) I. Mr. Allen
Two lecture and three three-hour laboratory periods weekly.
Prerequisite: courses 102 or 100A and 123 or 101A, or course 101M.
Lectures and laboratory work appertaining to blood analysis, respiratory gas analysis, and other methods that are used in biochemical laboratories and that illustrate normal and abnormal life processes.

GRADUATE COURSES

201. Intermediary Metabolism. (2) II. Mr. Tarver
Selected topics in the metabolism of amino acids and proteins.
- *205. Biochemistry of Cancer. (2) I. Mr. Greenberg
Survey of the biochemistry of neoplastic growth, tumors, and the tumor-bearing host.
- 280M. Research. (1-9) I and II. The Staff (Mr. Greenberg in charge)
Not less than 4 units except by special permission of the chairman of the department.
- 290M. Seminar. (1) I and II. The Staff (Mr. Greenberg in charge)
A seminar on the metabolism of the vertebrates.
- 299M. Special Study for Graduate Students. (1-3) I and II.
The Staff (Mr. Greenberg in charge)
Reading and conference for properly qualified graduate students under the direction of a member of the staff.

RELATED COURSES IN OTHER DEPARTMENTS

- Anatomy 101 (6), 102 (3).
Bacteriology 101 (6), 103 (2), 104 (4), 106 (2), 107 (2).
Botany 111 (4), 160A-160B (2-2), 161A-161B (2-2).
Chemistry 100 (3), 101 (3), 102 (3), 103 (3), 104 (3), 109 (3), 110A-110B (6), 111 (3), 114H (3), 115 (3).
Food Technology 112 (3), 113 (3), 120 (3).
Home Economics 118A (4), 118B (4), 101A (3), 101B (3), 112A-112B (3-3), 114 (4), 119 (3).
Physics 125 (1), 126 (2), 126L (1), 128 (1), 128L (2), 131 (2).
Physiology 100A-100B (6), 104 (2), 106 (2), 107 (3), 108 (3), 110A-110B (6), 112 (3), 120A (3), 120B (3), 120C (3)
Plant Nutrition 115 (2), 117 (2).
Soil Science 114 (3).
Zoölogy 100 (4), 101 (2), 101C (2), 102 (2), 102C (2), 103 (2), 106 (4), 107 (2), 114 (3), 121 (2), 122 (2).

BOTANY

(Department Office, 2017 Life Sciences Building)

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.*

* Not to be given, 1953-1954.

- Alva R. Davis, Ph.D., Sc.D., *Professor of Plant Physiology.*
 Ralph Emerson, Ph.D., *Professor of Botany.*
 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.*
 George F. Papenfuss, Ph.D., *Professor of Botany and Curator of Algal Collections.*
 Leonard Machlis, Ph.D., *Associate Professor of Botany.*
 Johannes M. Proskauer, Ph.D., *Assistant Professor of Botany.*
 John G. Torrey, Ph.D., *Assistant Professor of Botany.*



- Daniel I. Arnon, Ph.D., *Professor of Plant Physiology.*
 James P. Bennett, Ph.D., *Professor of Plant Physiology.*
 Eric E. Conn, Ph.D., *Lecturer in Plant Nutrition.*
 Louis Jacobson, Ph.D., *Associate Professor of Plant Nutrition.*
 Gordon Mackinney, Ph.D., *Professor of Food Technology.*
 Roy Overstreet, Ph.D., *Professor of Soil Chemistry.*
 Perry R. Stout, Ph.D., *Professor of Plant Nutrition.*
 Edward C. Stone, Ph.D., *Assistant Professor of Forestry.*

Letters and Science List.—All undergraduate courses in botany except 155 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Papenfuss.

Preparation for the Major.—Required: courses 1, 14 and 16, Chemistry 1A and 8, and Physics 2A-2B and 3A-3B. Recommended: Zoölogy 1A and elementary courses in other biological sciences; German and French under the foreign language requirement. Students who intend to major in *Functional Botany* (II below) are required to take, in addition, Chemistry 1B and 5, and are advised to take Mathematics 3A-3B. If the lower division program is crowded, one or more of the following courses may be postponed until the student reaches the upper division: courses 14 and 16, and Chemistry 1B, 5, and 8.

The Major.—The courses in botany are organized on levels of increasing specialization corresponding to the elementary (course 1), intermediate (courses 14, 16, 108, 111), and the advanced stages of instruction. Requirement for the major are: (1) course 108 and 111; (2) a course in genetics; and (3) completion of field of emphasis I or II below.

I. Structural Botany: additional upper division courses in Botany or approved courses in related departments, to complete the upper division unit requirements.

II. Functional Botany: Biochemistry 102, and three or four additional upper division courses selected from Botany, Bacteriology, Biochemistry, Chemistry, Food Technology, Plant Nutrition, Soil Science, or Zoölogy, to complete the upper division unit requirements.

LOWER DIVISION COURSES

1. General Botany. (5) I.

Mr. Papenfuss

Lectures and laboratory.

An introduction to the fundamental principles of biology as illustrated by plants, with emphasis on the morphology, physiology, and phylogenetic relations of the major plant groups.

Designed as the basic course in botany for all students of plant or animal science. Not open to students who have completed course 12.

12. Introduction to the Structure and Function of Plants. (4) I and II.
I. Mr. Emerson; II: Mr. Papenfuss. Mr. Emerson, Mr. Papenfuss
Lectures and demonstration periods. Designed primarily for students
who desire a general acquaintance with the fundamentals of botany. Not
a substitute for course 1. Not open to students who have completed course 1.
14. Comparative Morphology of Thallophytes and Bryophytes. (4) II.
Lectures and laboratory. Mr. Bonar, Mr. Proskauer
Prerequisite: course 1.
16. Comparative Morphology of Vascular Plants. (4) I. Mr. Foster
Lectures and laboratory.
Prerequisite: course 1.

RELATED COURSES IN OTHER DEPARTMENTS

- General Paleontology (Paleontology 1).
General Bacteriology and Microbiology (Bacteriology 2).

UPPER DIVISION COURSES

In addition to requirements specifically noted, the prerequisite for all upper division courses is course 1. Under exceptional circumstances Botany 12 may fulfill this requirement with the consent of the instructor.

Morphology and Taxonomy

101. Mycology. (4) II. Mr. Emerson
Lecture and laboratory.
Prerequisite: course 14.
The structure and development of the fungi. Myxomycetes, Phycomycetes, and Ascomycetes.
102. Mycology. (4) I. Mr. Bonar
Lectures and laboratory.
Prerequisite: course 14. Course 101 recommended but not required.
Fungi Imperfecti and Basidiomycetes.
104. Bryophyta and Basic Land Plants. (4) I. Mr. Proskauer
Lectures and laboratory.
Prerequisite: courses 14 and 16.
To be offered every other year.
An exploration of the ancient lines in the green land plants but predominantly a study of the present-day Bryophytes.
105. Plant Anatomy. (4) II. Mr. Foster
Lectures and laboratory.
Prerequisite: course 16 and consent of instructor.
Comparative structure and growth of the meristems; development and structure of important cell types, tissues, and tissue systems; comparative anatomy of stem, root, and leaf. Emphasis is placed upon the anatomy of gymnosperms and angiosperms.
- *107. Algology. (4) II. Mr. Papenfuss
Lectures and laboratory.
Prerequisite: course 14.
To be offered every other year.
Advanced morphology and taxonomy of algae.
108. Taxonomy of Seed Plants. (4) II. Mr. Mason
Lectures, laboratory, and field work.

* Not to be given, 1953-1954.

A survey of the spermatophytes, with lectures on phylogeny and classification; laboratory and field work with collection and identification practice.

- 110A. Phylogenetic Taxonomy. (3) I. Mr. Mason
Lecture and laboratory.
Prerequisite: courses 105 and 108.
Analysis of morphological problems fundamental to the systems of classification, with laboratory work on selected problems in morphology.
- 110B. Phylogenetic Taxonomy. (3) II. Mr. Mason
Lecture and laboratory.
Prerequisite: course 108, and Genetics 100.
110A is not prerequisite to 110B.
An introduction to population studies and experimental and other research methods applicable to taxonomy.

RELATED COURSES IN OTHER DEPARTMENTS

Plant Diseases (Plant Pathology 120).
Technique of Plant Pathology (Plant Pathology 121).
Advanced Paleobotany (Paleontology 120).
Yeasts and Related Organisms (Food Technology 116).
Microbial Metabolism (Bacteriology 103).
Soil Microbiology (Soil Science 111).
Wood Technology (Forestry 114).

Plant Physiology

111. Elementary Plant Physiology. (4) I and II. Mr. Machlis, Mr. Torrey
I: Mr. Torrey; II: Mr. Machlis.
Lectures and laboratory.
Prerequisite: Chemistry 1A and 8.
- 160A-160B. Lectures in Plant Physiology. (2-2) Yr.
160A: Mr. Machlis; 160B: Mr. Torrey. Mr. Machlis, Mr. Torrey
Prerequisite: course 111. Biochemistry 102 is recommended.
An advanced undergraduate course devoted to the comprehensive study of the physiology of plants.
- 161A-161B. Laboratory in Plant Physiology. (2-2) Yr.
161A: Mr. Machlis; 161B: Mr. Torrey. Mr. Machlis, Mr. Torrey
Prerequisite: course 111, 160A-160B (may be taken concurrently), Chemistry 5. Biochemistry 102 is recommended.
To accompany Botany 160A-160B.

RELATED COURSES IN OTHER DEPARTMENTS

General Biochemistry (Biochemistry 102).
Physical Chemistry (Chemistry 109, 111).
Physicochemical Biology (Zoölogy 101, 101C, 102, 102C, 121, 122).
Soils as a Medium for Plant Growth (Soil Science 110, 112, 113).
Principles of Forest Ecology (Forestry 103).
Properties of Colloidal Particles and Systems (Soil Science 114).
The Nutrition of Green Plants (Plant Nutrition 115, 117).
General Ecology (Zoölogy 125).

Cytology and Genetics

130. Plant Cytology. (4) I. Mr. Goodspeed
Lectures and laboratory
Anatomy and physiology of the cell.

RELATED COURSES IN OTHER DEPARTMENTS

Principles of Genetics (Genetics 100).
 Cytogenetics (Genetics 101, 101C)
 Biometrical Genetics (Genetics 102),
 Organic Evolution (Genetics 103A-103B).
 Technique of Plant Pathology (Plant Pathology 121).
 Microscopic Technique (Zoölogy 4).
 Cytology (Zoölogy 107, 107C).
 Physicochemical Biology (Zoölogy 101, 101C, 102, 102C, 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 instructor.
155. Botanical Microtechnique. (2) II. Mr. Proskauer
 Prerequisite: courses 105 and 130, or their equivalents and consent of
 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 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 10)

- 201A-201B. Research. Yr.
 Mr. Foster (in charge), Mr. Bonar, Mr. Constance, Mr. Emerson,
 Mr. Goodspeed, Mr. Machlis, Mr. Mason, Mr. Papenfuss, Mr.
 Proskauer, Mr. Torrey
 Credit according to the work completed.
 Original investigations of special problems in the field, laboratory, her-
 barium, or botanical garden.
203. Seminar in Cryptogamic Botany. (1) II.
 Mr. Proskauer (in charge), Mr. Bonar, Mr. Emerson, Mr. Papenfuss
 Prerequisite: qualified graduate students.
 A seminar on problems in fungi and lower green plants.
205. Seminar in Morphology and Taxonomy of Vascular Plants. (1) I.
 Mr. Constance (in charge), Mr. Foster, Mr. Mason

206. Seminar in Plant Physiology. (1) II.

Mr. Machlis (in charge), Mr. Arnon, Mr. Bennett, Mr. Conn,
Mr. Jacobson, Mr. Mackinney, 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 160A-160B, 161A-161B, Biochemistry 102, and consent of instructor.

Offered every other year.

Intensive reading of the classical and recent literature in the field of plant physiology with informal group discussions.

BUSINESS ADMINISTRATION

(Department Office, 113 South Hall)

* William L. Crum, M.A., Sc.D. (hon.), Ph.D., *Professor of Economics.*

Leonard A. Doyle, C.P.A., Ph.D., *Professor of Accounting.*

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.*

Maurice Moonitz, Ph.D., C.P.A., *Professor of Accounting, Lecturer in Law (Vice-Chairman of the Department of Business Administration).*

Arthur M. Ross, Ph.D., *Professor of Business Administration.*

William K. Schmelzle, M.B.A., Ph.D., *Professor of Business Administration.*

† Lawrence L. Vance, Ph.D., C.P.A., *Professor of Accounting.*

Ira B. Cross, Ph.D., *Flood Professor of Economics, Emeritus.*

Stuart Daggett, Ph.D., *Flood Professor of Transportation, Emeritus.*

Charles C. Staehling, M.S., C.P.A., *Professor of Accounting, Emeritus.*

John P. Carter, Ph.D., *Associate Professor of Business Administration.*

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.*

Choh-Ming Li, Ph.D., *Associate Professor of Business Administration.*

Sherman J. Maisel, M.P.A., Ph.D., *Associate Professor of Business Administration.*

David A. Revzan, Ph.D., *Associate Professor of Business Administration.*

Royal A. Roberts, M.B.A., *Associate Professor of Business Administration.*

Paul F. Wendt, Ph.D., *Associate Professor of Finance.*

David A. Alhadeff, Ph.D., *Assistant Professor of Business Administration.*

* Not to be given, 1953-1954.

† Sabbatical leave in residence, 1953-1954.

‡ Absent on leave, 1953-1954.

* In residence spring semester only, 1953-1954.

Frederick E. Balderston, M.A., *Acting Assistant Professor of Business Administration.*

Hans J. Brems, Ph.D., *Assistant Professor of Economics.*

Joseph W. Garbarino, Ph.D., *Assistant Professor of Business Administration.*

F. Theodore Malm, Ph.D., *Assistant Professor of Business Administration.*

Daryl G. Mitton, M.B.A., *Acting Assistant Professor of Business Administration.*

Frederic P. Morrissey, Ph.D., *Assistant Professor of Business Administration.*

Catharine De Motte Quire, Ph.D., *Assistant Professor of Accounting.*

Jack Dean Rogers, M.B.A., Ph.D., *Acting Assistant Professor of Business Administration.*

Frederick J. Seubert, M.B.A., *Acting Assistant Professor of Business Administration.*

Milo W. Smith, J.D., *Assistant Professor of Business Law.*

George J. Staubus, M.B.A., C.P.A., *Acting Assistant Professor of Business Administration.*

Dow Votaw, M.B.A., LL.B., *Assistant Professor of Business Law.*

James E. Walter, Ph.D., *Assistant Professor of Business Administration.*

Donald A. Corbin, M.B.A., C.P.A., *Associate in Accounting.*

Erick K. Erickson, M.B.A., *Associate in Accounting.*

David Felix, M.A., *Associate in Business Administration.*

James R. Longstreet, M.B.A., *Associate in Business Administration.*

Dale L. McKeen, M.B.A., *Associate in Accounting.*

Morton F. Moss, M.B.A., C.P.A., *Associate in Accounting.*

Albert H. Schaaf, A.B., *Associate in Business Administration.*

Robert R. Schutz, Ph.D., *Associate in Business Administration.*

George D. Shelby, A.B., *Associate in Business Administration.*

Reed K. Storey, B.S., *Associate in Business Administration.*

Waino W. Suojanen, M.B.A., *Associate in Accounting.*

◇

Charles C. Abbott, Ph.D., *Visiting Professor of Finance for the fall semester.*

Edward R. Hawkins, Ph.D., *Visiting Professor of Marketing.*

John W. Cowee, Ph.D., *Visiting Associate Professor of Insurance.*

Curtis C. Aller, Jr., A.B., B.L.H., *Lecturer in Business Administration.*

Samuel R. Hepworth, M.B.A., C.P.A., *Lecturer in Accounting.*

John P. Holland, Jr., B.S., C.P.C.U., *Lecturer in Business Administration.*

Dickson Reck, Ph.D., *Lecturer in Business Administration.*

Raymond A. Smardon, Jr., A.B., *Lecturer in Business Administration.*

Franklin C. Stark, J.D., *Lecturer in Business Law.*

The requirements for the curriculum in the School of Business Administration are listed in the CIRCULAR OF INFORMATION.

Letters and Science List.—Courses 1A, 1B, 10, 18, 100, and 150 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

LOWER DIVISION COURSES

1A-1B. Principles of Accounting. (3-3) Yr. Beginning each semester.

Mr. Corbin, Mr. McKeen, Mr. Moss, Mr. Staubus, Mr. Suojanen

Two lectures and one two-hour laboratory section weekly to be arranged.

Prerequisite: at least sophomore standing. 1A is a prerequisite to 1B.

It is recommended that students who plan to enter the School of Business Administration complete this course in their sophomore year.

10. General Accounting. (3) I and II. Mrs. Quire
 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. Balderston, Mr. Brems, Mr. Doyle, Mr. Felix,
 Mr. Longstreet, Mr. Maisel, Mr. Schutz, Mr. Walter
 Not open to students taking Economics 100A. Primarily for juniors.
 Prerequisite: Economics 1A-1B, 2 and junior standing.
 The development of economic analysis applicable to the problems of business enterprises in the areas of price, output, and utilization of resources; examination of the effects of business practices and policy on industry structure, consumers, labor, and government.

101. Business Fluctuations and Forecasting. (3) I and II.
Mr. Balderston, Mr. Carter, Mr. Felix, Mr. Garbarino,
 Mr. Maisel, Mr. Schutz, Mr. Shelby
 Prerequisite: Economics 1A-1B, 2 and course 100.
 Not open to students who have taken Economics 100B.
 General analysis of the factors responsible for economic instability and of the forecasting and other management problems thereby created for the business firm.

105. Business Law: Law of Business Organization and Regulation. (3) I and II. Mr. 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
 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 relation 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. Moonitz, Mr. Staehling, Mr. Staubus
A two-hour laboratory period to be arranged.
Prerequisite: course 1A-1B.
Intensive study of the advanced theory of accounts and its application.
Selected problems and reading on the various phases of accounting procedure. Required for those specializing in accounting.
122. Cost Accounting. (3) I and II.
Mr. Corbin, Mr. Doyle, Mr. Staubus, Mr. Suojanen
Lectures, and a two-hour laboratory period to be arranged.
Prerequisite: course 1A-1B.
Principles of cost compilation and cost accounting techniques including the methods of job order, process and standard costs, with attention to cost control devices and managerial use and analysis of cost accounting data; primary emphasis on industrial application.
123. Auditing. (3) I and II. Mr. Hepworth
Lectures, and a two-hour laboratory period to be arranged.
Prerequisite: course 121A.
Procedures for verification of financial records used by public accountants and internal auditors, including ethical, legal, and other aspects of the public accountant's work.
124. Budgetary Control and Accounting Systems. (3) I. Mr. Staubus
Prerequisite: courses 121A-121B, 122.
The preparation and administration of budgets, the design and maintenance of efficient accounting systems for managerial control and the quantitative analysis of specific problems confronting business management.
125. Governmental and Institutional Accounting. (2) I and II.
Mr. Erickson
Prerequisite: course 121A-121B, or consent of instructor.
126. Analysis of Financial Statements. (3) I. Mr. Corbin
(To be replaced by 121C in spring semester, 1954.)
Lectures, and a two-hour laboratory period to be arranged.
Prerequisite: course 121A-121B with at least a C average.
Analysis of financial data to measure the effectiveness of management; includes analysis from the viewpoints of the credit granter and the investor. The level of analysis employed presupposes extensive background in accounting.
131. Corporation Finance. (3) I and II.
Mr. Abbott, Mr. Crum, Mr. Longstreet, Mr. Morrissey, Mr. Walter
Prerequisite: course 1A-1B.
The corporation as one form of business organization; financial aspects of promotion and organization, operation as a going concern, expansion and consolidation, failure and reorganization; the capital market, financial instruments and institutions; public regulation of security issues and security exchanges.
133. Investments. (3) I and II. Mr. Morrissey, Mr. Walter
Prerequisite: Economics 1A-1B, 2 and course 131.
A study of the sources of, and demand for, investment capital, operations of security markets, determination of investment policy for individuals and institutions, and current procedures for analysis of different classes of securities.

135. Economics of Insurance. (3) I and II. Mr. Cowee, Mr. Holland
An introduction to the underlying principles of insurance followed by a descriptive study of the practices in the more important branches of the insurance business.
136. Life Insurance. (3) II. Mr. Cowee
Prerequisite: course 135.
A nontechnical study of principles and practice.
137. Property Insurance. (3) I and II. Mr. Cowee, Mr. Holland
Prerequisite: course 135.
138. Casualty Insurance. (3) I. Mr. Cowee
Prerequisite: course 135.
140. Production Organization and Management. (3) I and II.
Mr. Malm, Mr. Mitton, Mr. Reck, Mr. Schmelzle,
Mr. Schutz, Mr. Seubert
(Formerly numbered 190.)
Primarily for juniors.
An introduction to the theory and practice of production management; the problems of internal organization; the management of physical resources; product development; materials control; production control; production standards; managerial controls.
142. Production Planning and Control. (3) I and II. Mr. Mitton, Mr. Rogers
Prerequisite: course 140. Recommended: course 145.
Production planning and budgeting; development of the production control system, including product development, materials control, plant and equipment analysis, production standards and methods, personnel and supervision; control of production quantity through routing, scheduling, and dispatching; quality control—inspection and statistical quality control; measurement of production efficiency.
145. Industrial Procurement (3) II. 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. Aller, Mr. Galenson, Mr. Garbarino, Mr. Kerr,
Mr. Mitton, Mr. Ross, Mr. Seubert
Prerequisite: Economics 1A-1B and 2.
Students will not receive credit for both Economics 150 and course 150.
Designed to help beginning students understand labor-management issues through a study and interpretation of labor history, labor law, unionism, employer organization and policies, collective bargaining, wages, employment, social security, and problems of public policy.
151. Personnel Administration. (3) I and II.
Mr. Malm, Mr. Rogers, Mr. Smardon
Prerequisite: Economics 1A-1B, 2 and course 150 or Economics 150, or consent of the instructor.
Personnel policies and procedures, with special attention to the structure of personal relationships within the enterprise as it affects personnel management, and to the development and administration of the wage structure of a firm.

152. Collective Bargaining Systems. (3) I and II. Mr. Galenson, Mr. Garbarino
Prerequisite: course 150 or Economics 150.
The nature, instrumentalities, and structure of collective bargaining. Analysis of union agreement provisions and their economic and political significance. Bargaining experience in major industries. Determinants of peace and conflict in industrial relations.
153. Labor Law. (3) I and II. Mr. Davisson
Prerequisite: course 150 or Economics 150.
A study of federal and state laws and court decisions affecting hours, wages, strikes, boycotts, picketing, union recognition and operation, legality of collective agreements, etc. A discussion of the National Labor Relations Act, Fair Labor Standards Act, and other legislation.
160. Marketing. (3) I and II. Mr. Balderston, Mr. Hawkins, Mr. Revzan
The evolution of markets and marketing; market structure, organization and behavior; marketing functions; pricing and price policy; marketing problems of producers of raw materials, agriculturists, manufacturers, wholesalers and retailers; marketing costs and efficiency; public and private regulations.
161. Foreign Marketing. (3) I and II. Mr. Li
Prerequisite: course 160.
The marketing functions in foreign trade; organization and structure of import and export markets; export selling; foreign market analysis; price policies and price quotations; shipping procedure; customs requirements; government controls; settlement of commercial disputes.
- 162A-162B. Retail Store Management. (3-3) Yr. Mr. Roberts
Prerequisite: course 160.
163. Advertising. (3) I. Mr. Roberts
Prerequisite: course 160.
The basic concepts of advertising dealing with the preparation and execution of copy for various types of media. Study of the English used in advertising, illustration, and other elements of copy. The evaluation of principal types of media. Study of underlying psychology in copy and the psychology of the consumer as developed through product and market research.
164. Advertising Policy. (3) II. Mr. Jastram
Prerequisite: courses 100, 160, 163, or consent of 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. Roberts
Prerequisite: course 160.
Sales analysis and forecasting; organization of sales department; planning and policy determination; selection, training, compensating, and supervising sales force; territorial analysis; cost analysis, business and economic appraisal of selling.
166. Wholesaling. (3) II. Mr. Revzan
Prerequisite: course 160.
The meaning and importance of wholesaling; its place in the marketing structure; functions of wholesaling; the agency structure of wholesaling; internal managerial aspects; government regulations; trends; and costs, profits, and efficiency.

170. Transport Economics. (3) I and II. Mr. Carter
(Formerly numbered 170A.)
The demand for transportation; cost behavior of the important transport technologies, including private transportation; rate structures; government regulation; duties and responsibilities of carriers; government subsidies and promotional policies; growth rates and profit rates. Several field trips to be arranged.
- *171. Ocean Transportation. (3) II. Mr. Carter
(Formerly numbered 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
A technical survey of the purchase and sale of transportation; selection of routing; tariffs and their interpretation; rate structures and rate construction; rate claims and commission proceedings; analysis of bills of lading, loss and damage claims; plant and warehouse location.
175. Public Utilities. (3) II. Mr. Morrissey
The basis of control, administrative and judicial machinery employed, problems of service, price, competition, and monopoly.
176. Problems of Highway Transport. (3) II. _____
The movement of goods and people on highways; the organization, rates and practices of the for-hire branch of the industry; the general economic effects of highway transport developments; important problems in regulation, taxation and public policy.
180. Introduction to Real Estate and Urban Land Economics. (3) I and II. Mr. SchAAF
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) II. Mr. Li
Prerequisite: Economics 1A-1B, 2 and Economics 135.
Comparison of foreign and domestic exchange operations and problems; import-export banking; structure and operation of the free and controlled

* Not to be given, 1953-1954.

exchange markets; exchange rate policies and problems; payments arrangements; monetary areas; gold markets; and similar institutions and arrangements.

191. Management Problems and Policies. (3) I and II.

Mr. Reck, Mr. Rogers, Mr. Schmelzle

Prerequisite: senior standing and courses 100, 140, 160.

Integration of the subject matter of the required courses in business administration through the study of the problems of top management organization, administrative techniques, and policy formulation. The case method supplements extensive reading. Written reports are required.

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

The Staff (Mr. Grether in charge)

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

The Staff (Mr. Grether in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

221. Advanced Accounting Problems. (3) I and II. Mr. Moonitz, Mr. Vance
I: Mr. Vance; II: Mr. Moonitz.

Accounting problems in consignments, ventures, insurance, estates and trusts, and other topics, including problems which integrate and extend techniques and skills introduced in other courses.

222. Advanced Cost Accounting. (3) I and II.

Mr. Doyle

Prerequisite: courses 121A-121B, 122.

223. Seminar in Auditing. (3) II.

Mr. Vance

Prerequisite: courses 121A-121B, 123.

Historical background of the public accounting profession; development and current status of auditing standards; prominent recent and current professional problems; application of statistical sampling theory to auditing procedure.

226. Specialized Accounts. (2) II.

Mr. Mason

Will cover fiduciary accounting in 1953-1954. Accounting problems in estates, trusts, bankruptcies, and corporate reorganizations. Includes estate tax, gift tax, and related income tax procedure.

228. Income Tax Procedure. (3) I and II.

Mr. Mason, Mr. Smith

I: Mr. Smith; II: Mr. Mason.

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, Mr. Moonitz

229A. II: Mr. Mason; 229B. I: Mr. Moonitz.

Prerequisite: course 121A-121B.

229A. A survey of accounting literature with emphasis upon development of accounting theory. Includes early history, formal statements of principles, special depreciation problems, relation of economics and accounting, and the effect of price-level changes upon financial statements.

229B. Intensive study of current issues in accounting theory, e.g., asset valuation and income determination with emphasis upon controversial issues, special problems of regulated industries, consolidated financial statements.

- *230. Seminar in Money and Credit. (3) I and II. _____
Prerequisite: course 185 and Economics 135.
232. Money Markets and Capital Markets. (3) I. Mr. Abbott
Prerequisite: course 131 and Economics 135.
The organization and functions of, and the important influences upon, money and capital markets in the United States. Primarily concerned with private institutions operating in these markets. The influence of government financing operations and regulations is also considered.
233. Investments. (3) II. Mr. Wendt
Prerequisite: course 133 and consent of instructor.
Review of developments in institutional and individual investment policy. Tax problems and investment timing. Study of comparative investment performance of major classes of securities. Cycle theory and investment policy. Criteria of growth industries.
234. Problems in Business Finance. (3) I and II. Mr. Crum, Mr. Morrissey
I: Mr. Morrissey; II: Mr. Crum.
Application of principles of finance to the financial management of corporate enterprises, with special emphasis upon the financing of expansion. Program includes reading assignments on principles and methods of finance, and individual student reports on financial problems of particular corporations.
239. Seminar in Insurance. (3) II. Mr. Cowee
255. Seminar in Industrial Relations. (3) I. Mr. Ross
Prerequisite: Two industrial relations courses and consent of instructor.
Theoretical background for advanced study of collective bargaining and personnel administration. Wage determination; structure and operation of labor markets; origin and direction of labor movements; theory of industrial peace and conflict.
256. Seminar in Collective Bargaining. (3) II. Mr. Ross
Prerequisite: course 152 or the equivalent. Open to a limited number of undergraduate seniors with consent of 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. _____
Sources and objectives of managerial policies. Analysis of specific problems in terms of general situations. Selection of tools of personnel administration, procedures and special policies which are most appropriate and effective. Unconscious changes in or departures from broad policy.
259. Wage Policies and Wage Behavior. (3) II. Mr. Galenson, Mr. Kerr
260. Advanced Marketing. (3) I and II. Mr. Revzan
Prerequisite: course 160 and graduate standing.
Readings, case, problem, and special report work. Intended primarily for graduate students in business administration who are candidates for the professional M.B.A. degree but are not qualified for course 269A-269B.

* Not to be given, 1953-1954.

268. Marketing Investigation. (3) II. Mr. Hawkins
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, Mr. Revzan
269A. Critical review of the literature of marketing, including background and historical materials, market organization (the marketing channel, agency structure and vertical integration), marketing functions.
269B. Prices and price policies, area structure, costs and efficiency, commodity marketing, and public and private regulation.
279. Seminar in Transportation. (3) II. Mr. Carter
Analyses in selected topics of importance in the transportation field.
280. Real Estate and Urban Land Economics. (3) I. Mr. Maisel
Prerequisite: courses 106, 180, 181, and 182, or consent of instructor.
Theory of urban land utilization, problems in housing market analysis; housing finance and policy.
290. Business Investigations and Analysis. (3) I and II. Mr. Hawkins, Mr. Jastram
Meaning of research and scientific method. Forms of scientific method applicable to business research. Types of business research problems, and available types of materials. Actual research procedure, and application by student to his Business Administration 299 research project.
298. Seminar in Business Policy. (3) I and II. Mr. Schmelzle
299. Research in Business Problems. (1-6) I and II. The Staff (Mr. Grether in charge)
Primarily for candidates for the degree of Master of Business Administration.

CHEMISTRY AND CHEMICAL ENGINEERING

(Department Office, 110 Gilman Hall)

- Gerald E. K. Branch, Ph.D., *Professor of Chemistry.*
Melvin Calvin, Ph.D., *Professor of Chemistry.*
James Cason, Jr., Ph.D., *Professor of Chemistry.*
Robert E. Connick, Ph.D., *Professor of Chemistry.*
Burriss B. Cunningham, Ph.D., *Professor of Chemistry.*
William F. Giauque, Ph.D., *Professor of Chemistry.*
George E. Gibson, Ph.D., *Professor of Chemistry.*
² George Jura, Ph.D., *Professor of Chemistry.*
Wendell M. Latimer, Ph.D., *Professor of Chemistry.*
Axel R. 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.*

² In residence spring semester only, 1953-1954.

- Glenn T. Seaborg, Ph.D., *Professor of Chemistry.*
 Thomas D. Stewart, Ph.D., *Professor of Chemistry.*
 Theodore Vermeulen, Ph.D., *Professor of Chemical Engineering.*
 Charles R. Wilke, Ph.D., *Professor of Chemical Engineering (Chairman of the Division of Chemical Engineering).*
 Walter C. Blasdale, Ph.D., *Professor of Chemistry, Emeritus.*
 Joel H. Hildebrand, Ph.D., Sc.D., *Professor of Chemistry, Emeritus.*
 Charles W. Porter, Ph.D., *Professor of Chemistry, Emeritus.*
 Leo Brewer, Ph.D., *Associate Professor of Chemistry.*
 LeRoy A. Bromley, Ph.D., *Associate Professor of Chemical Engineering.*
 William G. Dauben, Ph.D., *Associate Professor of Chemistry.*
¹ William D. Gwinn, Ph.D., *Associate Professor of Chemistry.*
 Donald N. Hanson, Ph.D., *Associate Professor of Chemical Engineering.*
 Edwin F. Orlemann, Ph.D., *Associate Professor of Chemistry.*
 Richard E. Powell, Ph.D., *Associate Professor of Chemistry.*
 Henry Rapoport, Ph.D., *Associate Professor of Chemistry.*
 Donald S. McClure, Ph.D., *Assistant Professor of Chemistry.*
 Rollie J. Myers, Jr., Ph.D., *Assistant Professor of Chemistry.*
 Donald S. Noyce, Ph.D., *Assistant Professor of Chemistry.*
 Chester T. O'Konski, Ph.D., *Assistant Professor of Chemistry.*
 George C. Pimentel, Ph.D., *Assistant Professor of Chemistry.*
 David H. Templeton, Ph.D., *Assistant Professor of Chemistry.*
 Charles W. Tobias, Ph.D., *Assistant Professor of Chemical Engineering.*
 Berni J. Alder, Ph.D., *Instructor in Chemistry.*
 Charles F. Allen, Ph.D., *Instructor in Chemistry.*
 Dan F. Bradley, A.B., *Instructor in Chemistry.*
 Bruce R. McGarvey, Ph.D., *Instructor in Chemistry.*
 Eugene E. Petersen, Ph.D., *Instructor in Chemical Engineering.*
 Earle S. Scott, Ph.D., *Instructor in Chemistry.*
 Andrew Streitwieser, Jr., Ph.D., *Instructor in Chemistry.*
 William A. Klemperer, A.B., *Associate in Chemistry.*
 John E. Powers, Ph.D., *Associate in Chemical Engineering.*
 Hartland H. Schmidt, B.S., *Associate in Chemistry.*



Charles W. Koch, M.S., *Lecturer in Analytical Chemistry.*

Letters and Science List.—All undergraduate courses except 143, 144, 145A–145B, 146A–146B, 147, 149, and 152 are included in the Letters and Science List. For regulations governing this list, see page 7.

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 the CIRCULAR OF INFORMATION) or in the College of Letters and Science with a major in chemistry. In order to decide between the two alternatives, the student may note that the College of

¹ In residence fall semester only, 1953–1954.

Letters and Science has certain general lower division requirements (see the CIRCULAR OF INFORMATION) outside the preparation for the major, while the curriculum of the College of Chemistry is restricted mainly to chemistry, physics, and mathematics during the first two years. An upper division program in chemical engineering is offered in the College of Chemistry.

Letters and Science Upper Division Major Adviser: Mr. Giauque.

Preparation for the Major in the College of Letters and Science.—The recommended preparation is as follows: course 1A-1B, and one or more of courses 5, 12; Physics 4A, 4B, 4C; Mathematics 3A, 3B, 4A, 4B; and a reading knowledge of German.

The above-mentioned courses, though recommended, are actually required only in so far as they constitute prerequisites for courses included in the major. Prospective major students should familiarize themselves with such prerequisites, and the possible course sequence governed by them. Thus, Mathematics 4A is prerequisite to Chemistry 110A which in turn is a requirement of the major and is prerequisite to many upper division courses in chemistry.

High school students should note that the preparation for the major is simplified if their high school programs include chemistry, physics, four years of mathematics, and two years of German.

The Major.—The major consists of from 24 to 30 units of upper division work in chemistry and allied subjects, taken in accordance with a plan approved by the departmental adviser. Normally at least 18 units of the major must be taken in the department, and must include courses 112 and 110A-110B, and one of courses 105, 111, and 120. If one year of quantitative analysis has been completed elsewhere, course 104 may be substituted for course 105.

All units in chemistry in excess of 13 are counted as upper division units toward the major; all units in chemistry in excess of 13, taken in the upper division, will count as upper division credit toward the 36-unit requirement. Ordinarily an average of at least 1.5 grade points per unit undertaken is required for admission to, or retention in, the major.

Honor Students in the Upper Division.—Upper division students in the College of Letters and Science who propose to make chemistry their major, are placed on the honors list when they have attained a scholarship average of at least grade B. Honor students are given a larger share of personal instruction and a greater opportunity to choose courses, and work within courses, in the manner best suited to individual needs and aims. Students not in the honors group are not, except in unusual circumstances and with the express permission of the instructor, permitted to enroll for honors courses (marked H) nor for undergraduate research. Students will not ordinarily be recommended for honors in chemistry at graduation unless their work includes courses 114H and 180H or other advanced courses approved by the Committee on Honors.

Higher Degree.—See the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION.

CHEMISTRY

LOWER DIVISION COURSES

1A. General Chemistry. (5) I and II.

Mr. Powell, Mr. Giauque, Mr. Gibson, Mr. Latimer, Mr. Connick, Mr. Jura, Mr. Gwinn, Mr. McClure, Mr. O'Konski, Mr. Templeton, Mr. Brewer, Mr. Alder, Mr. Orlemann, Mr. Scott, Mr. Myers, Mr. Bradley, Mr. McGarvey

I and II: Lectures (Mr. Powell).

Prerequisite: high school chemistry or high grades in high school physics and mathematics. Admission will be determined by the student's high school grade and by the results of an aptitude test, to be given during the week of enrollment.

- 1B. General Chemistry. Qualitative Analysis. (5) II.
Mr. Latimer, Mr. Gibson, Mr. Giaque, Mr. Jura, Mr. Brewer,
Mr. Gwinn, Mr. McClure, Mr. O'Konski, Mr. Powell, Mr. Templeton,
Mr. Connick, Mr. Alder, Mr. Scott, Mr. McGarvey, Mr. Bradley
Lectures (Mr. Latimer).
Prerequisite: course 1A.
5. Quantitative Analysis. (3) I and II.
Mr. Olson, Mr. Orlemann, Mr. Pimentel, Mr. Myers
Lecture and laboratory.
Prerequisite: course 1B with a grade of C or higher.
8. A Short Survey of Organic Chemistry. (3) I and II. Mr. Stewart
Prerequisite: course 1A.
Primarily for students not majoring in chemistry.
9. Organic Chemistry—Laboratory. (3) I and II.
Lecture and laboratory. Mr. Branch, Mr. Cason, Mr. Streitwieser
Prerequisite: course 1B with a grade of C or higher. Course 8 may be
taken concurrently.
12. Organic Chemistry. (5) I and II.
(Formerly numbered 12A.) Mr. Calvin, Mr. Noyce, Mr. Streitwieser
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 chemis-
try of aliphatic compounds.
Students with previous credit in course 8 may receive only 2 units of
credit for course 12.

UPPER DIVISION COURSES

100. Organic Chemistry—Analytical Methods. (3) I and II.
Prerequisite: courses 5 and 112. Mr. Noyce, Mr. Dauben
101. Organic Chemistry—Synthetic Methods. (3) I and II.
Mr. Dauben, Mr. Rapoport, Mr. Allen
Prerequisite: course 112. A reading knowledge of German is recom-
mended.
102. Advanced Organic Chemistry. (3) I. Mr. Stewart
Prerequisite: courses 8 and 9 or 12; 109 or 110B; and a reading
knowledge of German.
Kinetics and mechanisms of organic reactions; the determination of
structure.
103. Advanced Organic Chemistry. (3) II. Mr. Branch
Prerequisite: courses 8 and 9 or 12; 109 or 110A; and a reading
knowledge of German.
Applications of electron structures and resonance to the chemical and
physical properties of organic compounds.
104. Inorganic Chemistry. (3) I. Mr. Latimer
Prerequisite: course 5.
The interpretation and correlation of inorganic reactions.
105. Advanced Quantitative Analysis. (3) I and II.
Lectures and laboratory. Mr. Orlemann, Mr. Pimentel
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. Mr. Rollefson, Mr. Templeton
110A. I: Mr. Rollefson; II: Mr. Templeton.
110B. I: Mr. Templeton; II: Mr. Rollefson.
Prerequisite: course 5, Mathematics 4A, and Physics 4B.
The general principles of physical chemistry and elementary thermodynamics.
111. Physical Chemistry—Laboratory. (3) I and II. Mr. Jura, Mr. Gwinn, Mr. O'Konski, Mr. McClure
Prerequisite: course 110A (with a grade of C or higher), and 110B (which may be taken concurrently), or 109 with consent of the instructor; also calculus.
112. Organic Chemistry. (5) I and II. Mr. Rapoport, Mr. Calvin, Mr. Streitwieser, Mr. Allen
(Formerly numbered 12B.)
Prerequisite: course 12 or 8 and 9.
Introduction to the chemistry of aromatic and heterocyclic compounds.
Simple enolate condensations.
- 112C. Organic Chemistry. (3) I and II. Mr. Calvin, Mr. Rapoport
(Formerly numbered 12C.)
Prerequisite: open only to students who received grade C or higher in course 12, taken at this University.
Equivalent to the lecture part of 112. Primarily for students in the chemical engineering curriculum of the College of Chemistry, but open to students from other colleges with the consent of the instructor.
- 114H. Physical Chemistry—Thermodynamics. (3) I and II. Mr. Giaque, Mr. Brewer, Mr. Pitzer
Prerequisite: courses 5, 110A–110B; Physics 4C or equivalent; familiarity with differential and integral calculus, and honors standing.
115. Microchemistry. (3) I and II. Mr. Cunningham, Mr. Koch
Prerequisite: senior standing in chemistry.
Synthesis and preparation of organic and inorganic samples on the milligram and microgram scale and their analysis by gravimetric and volumetric methods.
118. Chemistry of Surfaces and Colloids. (2) II. 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) II. Mr. O'Konski, Mr. Myers
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.
170. Methods and Concepts in Physical Science. (2) II. Mr. Hildebrand
Prerequisite: upper division standing and consent of the instructor.
Designed primarily as a contribution to the liberal education of students majoring in the humanities and social sciences. May be taken by honor students on the "passed" or "not passed" basis.
- 180H. Research. (2-15) I and II. The Staff (Mr. Pitzer in charge)
Prerequisite: course 110B and honors standing.
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)
Prerequisite: the consent of the instructor.
Special laboratory work for advanced undergraduates.
199. Special Study for Advanced Undergraduates. (2-3) I and II. The Staff (Mr. Pitzer in charge)
Any properly qualified student who wishes to pursue a problem of his own choice, through reading or nonlaboratory study, may do so if his proposed project is acceptable to the member of the staff with whom he works.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 207A. Organic Chemistry. (2) I. Mr. Cason
Emphasis is placed on typing of reactions according to mechanism, and the application to synthetic studies of current knowledge of reaction mechanism, molecular structure, and steric factors. Particular attention is given to displacement reactions, enolate condensations, and the Grignard reaction.
- 207B. Organic Chemistry. (2) II. Mr. Rapoport
Prerequisite: course 207A.
The chemistry of heterocyclic compounds, with emphasis on those of natural origin.
- *207C. Organic Chemistry. (2) _____
Prerequisite: course 207A
The chemistry of polycyclic compounds of biological interest, with emphasis on sterols and related compounds.
- *207D. Organic Chemistry. (2) _____
Prerequisite: course 207A.
The chemistry of the terpenes, including discussion of the mechanism of rearrangements.

* Not to be given, 1953-1954.

216. Physical Chemistry—Advanced. (3) II. Mr. Giaque
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; 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 if his proposed project is acceptable to the member of the staff with whom he works.
- Research Conference. (No credit)
Members of the instructing staff and students engaged in graduate research meet once a week to discuss the various investigations in progress in the laboratory.

CHEMICAL ENGINEERING

UPPER DIVISION COURSES

For program of upper division work in this field, see under College of Chemistry, CIRCULAR OF INFORMATION.

143. Introduction to Chemical Engineering. (3) I and II.

Mr. Hanson, Mr. Wilke
Prerequisite: course 109 or 110A or Mechanical Engineering 105A (may be taken concurrently).

A survey of chemical industry in relation to major products, equipment and economics. Problem work on weight and heat balances in representative processes.

144. Chemical Engineering Thermodynamics. (3) I and II.

Prerequisite: course 110B (may be taken concurrently), or Mechanical Engineering 103 and 105A. Mr. Tobias, Mr. Petersen

Thermal and volumetric properties of liquids and gases; interrelations of thermodynamic functions; power and refrigeration cycles; solutions and phase equilibria of multicomponent systems; critical phenomena; reaction energetics and equilibria.

145A. Unit Operations Laboratory. (3) I and II. Mr. Bromley, Mr. Petersen
Prerequisite: course 146B and Mechanical Engineering 107, or Mechanical Engineering 132.

Material and energy measurements and performance analysis on separation equipment of representative industrial types.

145B. Unit Operations Laboratory. (1-2) I and II. Mr. Bromley

Prerequisite: course 145A (may be taken concurrently).
Additional experiments in unit operations. An elective course for second semester seniors and graduate students in chemical engineering.

146A. Chemical Engineering Unit Operations. (4) II.

Prerequisite: course 110B (may be taken concurrently), 143 (with a grade of C or higher), or consent of the instructor. Mr. Hanson, Mr. Tobias

Thermodynamic and frictional effects for liquid and gas flow in process equipment. Heat transmission in solids and flow systems; radiation and pyrometry. Evaporation, mixing, filtration, crushing and grinding, mechanical separations.

146B. Chemical Engineering Unit Operations. (4) I.

Prerequisite: courses 110B, 143, and 146A or equivalent. Open to seniors in the College of Engineering concurrently enrolled in Chemical Engineering 144 or Mechanical Engineering 154, or with honor standing. Mr. Wilke, Mr. Hanson, Mr. Powers

Separation operations: distillation, absorption, humidification, extraction, crystallization, adsorption and drying.

147. Organic Chemical Unit Processes. (3) II. Mr. Stewart, Mr. Petersen

Prerequisite: courses 110B; 112 or 112C 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.

149-149H. Design of Chemical Process Plants. (2-3) II.

Prerequisite: courses 144, 146A-146B. Mr. Wilke, Mr. Bromley
Class discussion of sources of data and of design principles, with individual and team study of selected plant design and process evaluation problems. Students with honor standing will be permitted to enroll for 3 units and will complete a comprehensive design project.

152. Electrochemical Engineering. (3) I.

Prerequisite: courses 146B and 104, which may be taken concurrently, Mr. Tobias

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.

180H. Research in Chemical Engineering. (2-6) I and II.

Prerequisite: course 146B.

The Staff (Mr. Pitzer in charge)

Students with honor standing may prosecute original research under the direction of one of the members of the instructing staff. The consent of the instructor must be obtained.

GRADUATE COURSES

Chemical Engineering 146B or its equivalent is prerequisite to all courses in this group.

244. Distillation. (3) II.

Mr. Hanson

Design calculation methods for fractionation columns in binary and multicomponent separations.

245. Diffusional Operations. (3) I.

Mr. Wilke

Fundamentals of diffusion in static and flow systems. Advanced treatment of absorption, adsorption, drying and related unit operations, in relation to mass-transfer theory.

*246. Phase Equilibria in Extraction Operations. (2) I.

Mr. Vermeulen

Theory of ternary liquid systems; design of liquid-liquid contact equipment; azeotropic and extractive distillation.

249. Special Study for Graduate Students in Chemical Engineering. (2-4) I and II.

The Staff (Mr. Bromley in charge)

Properly qualified graduate students who wish to pursue independent study may work on the development of new calculation methods for a single unit operation or the application of existing design data to a single process.

250. Research in Chemical Engineering. (1-6) I and II.

The Staff (Mr. Wilke in charge)

Research facilities will be provided for graduate study in the unit physical operations and the unit chemical processes.

260. Seminar in Chemical Engineering. (2-4) I and II.

The Staff (Mr. Tobias in charge)

Reports, discussions, and group design studies in advanced fields of chemical engineering. Topics offered previously include: applications of thermodynamics; technology of high temperature; isotope-separation processes; mathematics in chemical engineering especially as applied to transient phenomena. The following topics will be offered during 1953-1954:

I. Transport properties of fluids including momentum transfer and conduction of heat and electricity (Mr. Bromley, Mr. Tobias).

II. Selected topics in chemical engineering unit operations (Mr. Wilke).

RELATED COURSES IN OTHER DEPARTMENTS

Mechanical Engineering 163. Flow Problems of the Process Industries. (3) II.

Mechanical Engineering 180. Selection of Process Equipment and Materials of Fabrication. (3) II.

Mechanical Engineering 266. Heat Convection. (3) II.

Metallurgy 111. Metallurgical Unit Operations Laboratory. (2) I.

Petroleum Engineering 209A-209B. Seminar in Petroleum Processing. (2-2) or (3-3) Yr.

* Not to be given, 1953-1954.

CHILD DEVELOPMENT

An undergraduate Group Major in Child Development is offered in the College of Letters and Science and also an undergraduate major in child development in the Department of Home Economics. Information concerning these majors is presented in the CIRCULAR OF INFORMATION.

Graduate work leading to the Master's and Ph.D. degrees is offered in the Field of Child Development and also in Education, Home Economics, and Psychology. Requirements for the field are given in the ANNOUNCEMENT IN SOCIAL SCIENCES, 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. Courses restricted to students in a single department are not included.

Growth and Development of Children. (Education 111, Mrs. Jones, Mr. Tyler)

The Exceptional Child. (Education 116, Mr. Holmes)

Children's Thinking. (Education 211B, Mr. Russell)

Child Psychology. (Home Economics 132, Miss Landreth)

Laboratory in Child Development. (Home Economics 133, Miss Landreth, Mrs. Sidwell)

Techniques with Young Children. (Home Economics 135, Miss Landreth, Miss Peters, Mrs. Sidwell)

Marriage and Family Relationships. (Home Economics 137, Mr. Landis)

The Contemporary American Family. (Home Economics 138, Mr. Landis, Mr. Vincent)

Sociology of Child Development. (Home Economics 139, Mr. Vincent)

Seminar in Psychology of Early Childhood. (Home Economics 232, Miss Landreth)

Research in Family Sociology. (Home Economics 237, Mr. Landis)

Nursery School Administration. (Home Economics 435, Miss Landreth)

Physiology of Growth and Development in the Child. (Physiology 102, Mrs. Eichorn)

Child Psychology. (Psychology 111, Mr. Jones)

Developmental Psychology. (Psychology 112, Mr. McKee)

Adolescence. (Psychology 113, Mr. Jones)

Adolescent Psychology. (Psychology 113N, Mr. McKee)

Laboratory in Child Study. (Psychology 114, 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)

Personality in Society and Culture. (Psychology 141, Mr. Sarbin)

Mental Deficiency. (Psychology 160, Miss Bridgman)

Personality Development. (Psychology 161, Mrs. Schumacher)

Introduction to Clinical Methods. (Psychology 165, Mr. Tuddenham)

Seminar in Developmental Psychology. (Psychology 212E, Mr. McKee)

Child Health. (Public Health 125, Miss Bierman)

The Field of Social Welfare. (Social Welfare 100, Mr. Chernin)

CITY AND REGIONAL PLANNING

(Department Office, 101 City and Regional Planning Building)

T. J. Kent, Jr., M.C.P., *Professor of City Planning (Chairman of the Department)*

Francis Violich, B.S., *Associate Professor of City Planning and Lecturer in Landscape Architecture.*



Catherine Bauer (Catherine Bauer Wurster), A.B., *Lecturer in City Planning.*

Mellier G. Scott, Jr., *Lecturer in 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 7.

The Department of City and Regional Planning, established in July, 1948, offers a two-year graduate program of professional training in the field of urban planning leading to the degree Master of City Planning.

The program includes courses in the theory and practice of urban planning offered by the department, and courses in related fields of study offered by members of other departments. Some of these courses may be open to qualified undergraduate students.

UPPER DIVISION COURSES

110. Introduction to City Planning. (3) I. Mr. Scott

Survey of city planning as it has evolved in United States since 1800 in response to serious physical, social, and economic problems; examination of major concepts and procedures used by contemporary city planners and local governments to improve the urban environment. The course is open to majors in all fields.

*121. Urban Aesthetics. (2) II.

Development and present-day significance of the form of the urban environment; importance of urban form to the well-being of the individual and society; techniques available or necessary to make urban areas more satisfying aesthetically.

* Not to be given, 1953-1954.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Seminar in City Planning History and Theory. (2) I. Mr. Violich
Historical background of the modern city planning movement, and the theory and practice of contemporary city planning.
202. Seminar in City Planning Principles and Methods. (2) II. Mr. Violich
Description and analysis of the methods and techniques used in the practice of contemporary city planning.
203. Seminar in City Planning Law and Administration. (2) I. Mr. Kent
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
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. Kent
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. Kent
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. Violich
Practical application of urban planning theory to problems of towns, cities, metropolitan regions, and urban counties, including advanced problems of replanning and redevelopment of existing communities. Individual problems, supplemented by group projects worked out in collaboration, requiring preliminary and final reports.
299. Directed Research. (2-4) I and II. The Staff (Mr. Violich in charge)
Prerequisite: a limited number of exceptional senior students may be admitted.

CLASSICS

(Department Office, 5218 Dwinelle Hall)

- Murray B. Emeneau, Ph.D., *Professor of Sanskrit and General Linguistics.*
Arthur E. Gordon, Ph.D., *Professor of Latin (Chairman of the Department).*
Louis Alexander MacKay, M.A. (Oxon.), *Professor of Latin.*
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.O., *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 C. Helmbold, Ph.D., *Associate Professor of Classics.*
 William Kendrick Pritchett, Ph.D., *Associate Professor of Greek.*
 Ben L. Charney, Ph.D., *Assistant Professor of Latin.*
 Frederic Peachy, Ph.D., *Assistant Professor of Classics.*
 Elroy L. Bundy, M.A., *Acting Instructor in Classics.*



- C. Douglas Chrétien, Ph.D., *Professor of Speech and Lecturer in Linguistics.*
 J. A. O. Larsen, Ph.D., *Sather Professor of Classical Literature for the spring semester.*

Letters and Science List.—All undergraduate courses in Classics, Greek, Latin, and Sanskrit are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Peachy.

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

The Major in Classics.—Required: Greek 100, 101, 102, 103; Latin 105, 106, 107, 108.

GREEK

Major Adviser: Mr. Peachy.

Preparation for the Major.—Required: Greek 1 or 1A-1B. Recommended: Latin 1A-1B or 1, 2, 3, 4.

The Major.—The following courses must be included in the major of 24 units: (a) Greek 100, 101, 102, 103, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Greek. The remaining units of the 24 should be chosen, with the advice of the department, from the following: upper division courses in Classics, Greek, Latin, Sanskrit, and in the History of Ancient Art; History 111A.

LATIN

Major Adviser: Mr. Peachy.

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

The Major.—The following courses must be included in the major of 24 units: (a) Latin 105, 106, 107, 108, unless they have been taken in the lower division; (b) at least 6 units in advanced upper division courses in Latin. The remaining units of the 24 should be chosen, with the advice of the department, from the following: upper division courses in Classics, Latin, Greek, Sanskrit; Art 153 (Aegean); Art 154A-154B (Greek); Art 159 (Roman); History 111B; but the department will consider as well other courses which the student may suggest.

CLASSICS

COURSES WHICH DO NOT REQUIRE A KNOWLEDGE OF THE GREEK OR THE
LATIN LANGUAGE

(Courses in this group are designated Classics 34, Classics 35, etc.)

LOWER DIVISION COURSES

- 10A-10B. Ancient Greek and Roman Civilization. (3-3) Yr. Mr. Gordon
 10A: Greek. 10B: Roman.
 (Formerly numbered 182A-182B.)
 Lectures and discussion; illustrative material. Either semester may be taken independently.
34. Epic Poetry: Homer and Vergil. (2) II. Mr. Gordon
 A study of the *Iliad*, *Odyssey*, and *Aeneid* with reference to content, structure, significance, and influence.
35. Greek Tragedy. (2) I. Mr. Peachy
 Lectures on twelve Greek tragedies.
- 37A-37B. Survey of Greek Literature. (2-2) Yr. Mr. Helmbold
 A study of the main movements and personalities in classical Greek literature, Homer to Lucian.

UPPER DIVISION COURSES

127. Rome and the Conquest of the Hellenistic World. (2) II. Mr. Larsen
135. Greek and Roman Comedy. (2) II. Mr. Bundy
 Prerequisite: Classics 35.
 The form and development of comedy in Greece and Rome, with study of selected texts.
138. The Greek and Roman Historians. (2) II. Mr. Pritchett
 Lectures on the major classical historians.
- 140A-140B. The Latin and the Greek Element in English. (2-2) Yr.
 140A. The Latin Element in English. Mr. Charney
 140B. The Greek Element in English.
 A nontechnical course designed primarily for students who have not had Latin or Greek. Either part may be taken independently.
151. Greek Religion. (2) I. Mr. Fontenrose
 The worship of the gods in ancient Greece; cults and religious ideas.
170. Classical Archaeology. (2) Mr. Smith
 †170A. Vase Painting in Greece and Italy to 600 B.C.
 ‡170B. Vase Painting in Greece and Italy in the sixth century.
 170C. Vase Painting in Greece and Italy from 500 B.C. (I)
171. Archaeological Method. (2) Mr. Smith
 †171A; ‡171B; 171C. (II)
 A series of courses giving practice in the interpretation of classical antiquities in the Anthropological Museum of the University of California, and elsewhere.
178. Greek and Roman Mythology. (3) II. Mr. Fontenrose
 Myths, legends, and folk tales of ancient Greece and Italy; their place in the literature and art of both the ancient and the modern world.
- 180A-180B. The Latin Classics in English. (2-2) Yr. Mr. MacKay
 180A. The Republic.
 180B. The Early Empire.
 Open to lower division students by consent of instructor.

† Not to be given, 1953-1954; to be given, 1954-1955.

‡ Not to be given, 1953-1954 or 1954-1955; to be given, 1955-1956.

197. India. (2) I. Mr. Emeneau
The social, economic, and political structure of modern India.



For graduate courses in Classics, see page 75.

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. Peachy
1A-1B. Greek for Beginners. (3-3) Yr. Mr. Pritchett, Mr. Bundy
*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. Bundy
101. Homer. (3) II. Mr. Fontenrose
102. Plato: *Apology and Crito*. (3) I. Mr. Peachy
103. Drama. (3) II. Mr. Pritchett
115. Senior Course in Greek Drama. (3). Mr. Helmbold
115A. Aristophanes. II.
†115B. Sophocles.
‡115C. Aeschylus.
120. Senior Course in Greek Prose Authors. (3). Mr. Pritchett
120A. Demosthenes. I.
†120B. Thucydides.
‡120C. Herodotus.
127. Rome and the Conquest of the Hellenistic World. (1) II. Mr. Larsen
Selections from Polybius, Livy, and inscriptions; to accompany Classics 127.
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.

* Not to be given, 1953-1954.

† Not to be given, 1953-1954. To be given, 1954-1955.

‡ Not to be given, 1953-1954 or 1954-1955. To be given, 1955-1956.

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

LATIN

(Courses in this group are designated Latin 1, Latin 2, etc.)

Language and Literature

LOWER DIVISION COURSES

1. Elementary Latin. Double Course. (5) II. Mr. Bundy
Sections meet five hours per week.
- 1A-1B. Elementary Latin. Beginners' Course. (3-3) Yr.
Mr. Charney, Mr. Fontenrose, Mr. MacKay, Mr. Peachy
2. Elementary Latin (continuation of 1A-1B or 1). (4) I and II. Mr. Green
Sections meet five hours per week.
Prerequisite: two years of high school Latin or Latin 1 or consent of the instructor.
3. Latin Prose Readings. (4) I. Mr. Smith
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) II. Mr. Smith
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. Green
Prerequisite: at least completion of Latin 2.
Recommended to accompany Latin 3 and 4.
- 20A-20B. Introduction to Latin Literature. (3-3) Yr.
Mr. Gordon, Mr. Bundy
Prerequisite: Latin 1A-1B or Latin 1 or equivalent.
Reading and translation of representative selections, prose and poetry.
- 48A-48B. Language Review of Elementary Latin Including Elementary Readings. (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 part may be taken independently.
Does not fulfill requirement (b) or (e) for the Associate in Arts degree in the College of Letters and Science.

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. Green
106. Horace: *Odes and Epodes*. (3) II. Mr. MacKay
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. MacKay
145. Senior Course in Latin Poetry. (3) Mr. Fontenrose
 †145A. Lucretius.
 145B. Augustan Poets. I.
 †145C. Juvenal.
150. Senior Course in Latin Prose Authors. (3) Mr. Charney
 †150A. Sallust.
 150B. Seneca. II.
 †150C. Tacitus.
166. Latin Verse Composition. (1) I. 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**UPPER DIVISION COURSES**

- 190A-190B. Elementary Sanskrit. (3-3) Yr. Mr. Emeneau
199. Special Study for Advanced Undergraduates. (1-5) I and II.
 Mr. Emeneau

CLASSICS**GRADUATE COURSES**

All graduate courses in this department are designated Classics (Classics 213, etc.).

(Concerning conditions for admission to graduate courses, see page 10)

200. Proseminar. (3) I. Mr. Helmbold
 An introduction to the general literature of classical philology, to methods of research, and to textual criticism.
205. Livy. (3) I. Mr. Gordon
215. Herodotus. (3) II. Mr. Fontenrose
216. Thucydides. (3) I. Mr. Pritchett
225. Pindar. (3) I. Mr. Bundy
235. Greek Tragedy. (3) II. Mr. Peachy
249. Latin Lyric and Elegiac. (3) I. Mr. MacKay
255. Lucan. (3) II. Mr. Helmbold
260. Latin Epigraphy. (3) II. Mr. Gordon
- 271A-271B. Advanced Course in Archaeological Method. (2-2) Yr.
 Mr. Smith

† Not to be given, 1953-1954. To be given, 1954-1955.

‡ Not to be given, 1953-1954 or 1954-1955. To be given, 1955-1956.

- 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.*
Bertrand H. Bronson, Ph.D., *Professor of English.*
Yuen Ren Chao, Ph.D., Litt.D., *Agassiz Professor of Oriental Languages and Literature.*
Michele DeFilippis, Ph.D., *Professor of Italian.*
Assar G. Janzén, Ph.D., *Professor of Scandinavian.*
Louis Alexander MacKay, M.A. (Oxon.), *Professor of Latin.*
Oleg A. Maslenikov, Ph.D., *Associate Professor of Slavic Languages and Literature.*
Warren Ramsey, Ph.D., *Associate Professor of French and Comparative Literature.*
David W. Reed, Ph.D., *Assistant Professor of English.*
Arnold H. Rowbotham, Ph.D., *Professor of French (Chairman of the Committee).*
Aldo Scaglione, Dottore in Lettere, *Assistant Professor of Italian.*
Arturo Torres-Rioseco, Ph.D., *Professor of Latin American Literature.*

Instruction in comparative literature is not organized as a single administrative unit in the University, but the relevant courses are offered by a number of departments. The degree of Master of Arts will be conferred upon qualified graduate students who complete the requirements. Prospective candidates for the degree should consult the chairman of the committee in charge.

Letters and Science List.—All undergraduate courses are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Preparation for the Major.—Required: an adequate knowledge of two foreign languages; 12 upper division units in each of two literatures, read in the original, or an equivalent competence, tested by examination. Recommended: further study in courses dealing with more than one literature, such as Modern European Drama; Dramatic Art 160A-160B, Dramatic Theory; English 44A-44B, Masterpieces of Literature; Philosophy 136A-136B-136C, Aesthetics. Philosophy 146, Philosophy in Literature.

The Major.—Twenty units of upper division or graduate courses and a thesis, in accordance with Plan I of the requirements for the degree of Master of Arts. A subcommittee will be in charge of the candidate's program and will be responsible for approving and directing the work on the thesis.

UPPER DIVISION COURSE

- *121. Romanticism in Western Europe. (3) I. Miss Bonwit
Prerequisite: Knowledge of French or German (preferably both) required.
The Movement in France and Germany, with references to English Romanticism.

* Not to be given, 1953-1954.

- 151A-151B. The Renaissance in the Literatures of Italy, France and England. (2-2) Yr. Mr. Scaglione

A course in the ramifications of the Renaissance movement in the countries named, with special reference to Italy, including discussions of the different phases of the movement and the contribution of various great writers to it.

GRADUATE COURSES

- 201A-201B. The Symbolist Movement in European Literature. (2-2) Yr.

Mr. Ramsey

A study of Symbolism, especially in French, German, English and Spanish literatures.

298. Special Study for Graduate Students. (1-4) I and II.

Committee in charge

CRIMINOLOGY

(Department Office, 218 Building T-2)

Douglas M. Kelley, M.D., Med. Sc.D., *Professor of Criminology.*

Paul L. Kirk, Ph.D., *Professor of Criminalistics and Professor of Biochemistry (Department of Biochemistry).*

Austin H. MacCormick, A.B., M.A., *Professor of Criminology.*

Arthur H. Sherry, A.B., LL.B., *Professor of Criminology and Law.*

Orlando W. Wilson, A.B., *Professor of Criminology (Chairman of the Department).*

M. Edwin O'Neill, M.S., *Associate Professor of Criminalistics.*



Jesse L. Carr, M.D., *Clinical Professor of Pathology and Legal Medicine and Lecturer in Criminology for the fall semester.*

John D. Holstrom, A.B., *Lecturer in Criminology.*

The requirements for the curricula in the School of Criminology are listed in the CIRCULAR OF INFORMATION.

UPPER DIVISION COURSES

Prerequisite: junior standing, except sophomore students scheduled to attain junior standing in midyear who may enroll in basic courses in the fall semester.

- 100A-100B. Crime Causation, Prevention, and Correction. (3-3) Yr.

Course 100A not prerequisite to 100B.

Mr. MacCormick

Orientation survey of the causes of juvenile delinquency and adult crime, methods of prevention, and current practices in the correctional treatment of offenders in institutions and on probation and parole.

101. Crime Investigation. (2) I.

Mr. Wilson

Principles involved in the investigation of crimes; 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 except for criminalistic majors.
 Introduction to the principles of police organization and administration, discussion of police statistics, criminal identification, and investigation; educational methods for combating crime and vice, and controlling traffic.
107. Personal Identification. (3) II. Mr. O'Neill
 A study of methods used in the identification of persons, living and dead; fingerprint identification; Bertillonage; sight recognition; portrait parle; anatomical bases, including skeletal remains to ascertain sex, race, age, size, and identity.
111. Physical Evidence. (2) I. Mr. O'Neill
 Lecture and laboratory.
 Prerequisite: course 101 (may be taken concurrently).
 Enrollment limited to criminology majors.
 Search at crime scenes for physical evidence and photographing, recording, preserving, and transporting it to the laboratory. Cast preparation and tests conducted at crime scenes.
113. Legal Medicine. (3) I. Mr. Carr
 Prerequisite: Physiology 1.
 Effect of impact of criminal actions upon the human body; physical, chemical, and other traumatic influences. Survey of body fluids, tissues, different classes of poisons, their recognition, and untoward effects. Pathological changes in death and their significance in criminology.
- 115A-115B. Legal Relations Involved in Criminology. (3-3) Yr. Mr. Sherry
 Prerequisite: enrollment restricted to criminology majors.
 Basic principles of the law of crimes, criminal procedure and evidence; the enforcement processes of the criminal law; the legal relation of the police function to the prosecuting function, the judicial function and the administration of justice; constitutional limitations of the police power.
151. Microchemical Testing of Physical Evidence. (5) II. Mr. Kirk
 Lecture and laboratory.
 Prerequisite: Chemistry 5, 12A, and 12C, with a grade of C or higher and consent of instructor.
 Application of microchemical and microscopic methods to the examination of physical evidence.
153. Advanced Techniques in Evidence Examination. (3) I and II. Mr. Kirk
 Laboratory.
 Prerequisite: course 151 and consent of instructor.
 A limited number of students may pursue advanced microchemical examination of evidence and special problems in criminalistic techniques with emphasis on instrumental methods and the newer chemical separation techniques.
155. Comparative Microscopy. (3) II. Mr. O'Neill
 Lecture, demonstrations, and laboratory.
 Prerequisite: course 111. Recommended: Botany 1 and Zoölogy 4.
 Comparative studies of gross and microscopic characteristics of crime

exhibits including glass, metal, wood, cloth, paper, string, and rope; examinations of tools and tool marks; principles of comparison of bullets and cartridge cases; reproduction by impressions, casts, and photographs.

157. Questioned Documents. (3) I. Mr. O'Neill
Lecture, demonstrations, and laboratory.
Prerequisite: course 111 and consent of instructor.
Problems of handwriting, handprinting, and typewriting in the examination of questioned documents, including studies of erasures, alterations, and obliterations; methods of restoring and deciphering effaced writing; document photography; investigation of anonymous letters.
161. Psychiatric Aspects of Criminology. (3) II. Mr. Kelley
Prerequisite: Criminology 103.
Abnormal personalities are examined from a clinical diagnostic viewpoint in relation to anti-social activities; the etiology, psychopathology, prognosis, and treatment of the common mental disorders are considered in their medico-legal aspects.
162. Therapeutic Theories in Preventive Criminology. (3) II. Mr. Kelley
Prerequisite: course 161 (may be taken concurrently) or satisfactory equivalents.
The relationships of mental hygiene and psychiatry to criminological problems are explored from the viewpoint of those methodologies tending to prevent the formation of criminal patterns or to ameliorate already established trends through various psychotherapeutic techniques.
163. Interrogation and Detection of Deception. (4) I. Mr. Kelley
Prerequisite: course 161.
Three lectures and one three-hour laboratory section each week.
All phases of interrogation including techniques for deception detection are studied from an historical, psychological, physiological and psychiatric point of view. Laboratory experiments and techniques designed to uncover attempts at deception in unlawful situations, together with theory and practice of report writing are presented.
164. Instrumental Detection of Deception. (2) II. _____
One lecture and one three-hour laboratory section each week.
Prerequisite: course 163.
Advanced evaluation is undertaken of instrumental methods studied in their physiological, psychological and legal aspects. Past and present techniques are surveyed through study with various apparatus and from this experience theoretical postulations for future development are evolved and appraised.
171. Police Planning. (2) II. Mr. Wilson
Prerequisite: course 105B or consent of instructor.
Considerations in discovering and analyzing needs, formulating policies, developing plans and procedures, and evaluating their effectiveness. Analysis of distribution of personnel, measures of performance and service, selection, training and discipline, M. O., operating programs, procedural manuals, and tactics.
172. Plant Security. (2) I. _____
The prevention of losses to private enterprises and government establishments from sabotage, other crimes, and accidents. Problems related to national defense, the organization and operation of security forces, and the use of protective devices.

182. Institutional Treatment of the Criminal and Delinquent. (2) I.
Mr. MacCormick
Modern philosophy and methods in the treatment of adult criminals and juvenile delinquents in correctional institutions.
184. Non-Institutional Treatment of the Criminal and Delinquent. (2) II.
Mr. MacCormick
Modern philosophy and methods in the non-institutional treatment of adult criminals and juvenile delinquents through probation, parole, and community services.
- 195A-195B. Proseminar in Criminalistics. (1-1) Yr. Mr. Kirk
199. Research and Special Study for Advanced Undergraduates. (1-4) I and II. The Staff

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 291A-291B. Seminar in Police Administration. (2-2) Yr. Mr. Wilson
292. Seminar in Organized Crime. (2) II. Mr. Sherry
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. The Staff

DECORATIVE ART

(Department Office, 104 Decorative Art Building)

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, Museum of Anthropology, and Director of the Art Gallery.*

Mary F. Patterson, *Associate Professor of Decorative Art and Design, Emeritus.*

Anna Hadwick Gayton (Anna Gayton Spier), Ph.D., *Associate Professor of Decorative Art and Associate Curator of Textiles, Museum of Anthropology.*

²Lea 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.*

John E. French, Ph.D., *Assistant Professor of Decorative Art.*

Willard V. Rosenquist, M.A., *Assistant Professor of Decorative Art.*

Charles E. Rossbach, M.F.A., *Assistant Professor of Decorative Art.*

² In residence spring semester only, 1953-1954.

* Absent on leave, 1953-1954.

James W. Baughman, M.A., *Acting Instructor in Decorative Art.*

Mrs. Juanita O. Hall, *Acting Instructor in Decorative Art.*

Willis C. Kauffman, M.A., *Acting Instructor in Decorative Art.*

Lynnette G. Stanaitis, A.B., *Acting Instructor in Decorative Art.*

Letters and Science List.—All undergraduate courses in decorative art are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Wellington, Miss Gladding.

Entrance with Advanced Standing.—All undergraduate transfer students requesting advanced standing are required to present examples of their work for evaluation by the staff.

Preparation for the Major.—Required: course 6A-6B (4), 7A-7B (4), and Art 2A (2). Recommended: Architecture 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 and Social Institutions 141A (3), 141B (3), 142 (3), or 145 (3).

Courses 175A-175B, 176A, 193A-193B, 195A-195B should normally be taken in the junior year. Courses 130A-130B, 196A-196B should be taken in the senior year.

Honors.—Senior students who have attained at least a B average in their major courses may enroll for course 199.

Honors at graduation are awarded to students who have completed their major work with distinction and have attained uniformly high grades in all their college work.

Exhibits.—Students' work may be retained by the department as exhibit material for a specified time.

LOWER DIVISION COURSES

6A-6B. Theory of Design and Color. (2-2) Yr. Beginning each semester.

Miss Nelson, Mr. French, Mrs. Hall, Mr. Rossbach, Mr. Baughman,
Mrs. Stanaitis, Mr. Rosenquist, Mr. Kauffman

6A surveys the basic elements of the subject and their relation to everyday life through experience in designing with line, space, and color.

6B recapitulates and extends this experience.

7A-7B. Theory of Design and Color. (2-2) Yr. Beginning each semester.

Mrs. Miller, Mr. French, Mrs. Stanaitis, Mr. Baughman, Mrs. Hall
Prerequisite: course 6A-6B.

Analysis of traditional and contemporary designs. Second-year problems that emphasize the integration of design theory with specific properties of material, process and function.

UPPER DIVISION COURSES

127. Primitive Art. (3). Miss Nelson
 127A. Form as it applies to primitive art; the primitive arts of Paleolithic West Europe, South and West Africa and Arctic North America. (3) I.
 127B. The primitive arts of Oceania and South America. (3) II.
 *127C. The primitive arts of Middle and North America. (3) II.
 Prerequisite: 127A is prerequisite to 127B and 127C, but 127B is not prerequisite to 127C.
- 130A-130B. Interior Design. (2-2) Yr. Mr. Wellington
 130A is prerequisite to 130B.
 Lectures: the design, selection, and arrangement of furniture with special consideration for its relation to the architectural background.
- 160A-160B. Advanced Design. (2-2) Yr. Beginning each semester. Miss Gladding
 Prerequisite: courses 6A-6B, 7A-7B, and Art 2A. With consent of instructor, 160A and 160B may be taken out of their normal sequence in either semester. Enrollment limited by laboratory facilities.
 A study of pattern beyond the single unit of design, executed in various media.
166. Principles of Three-dimensional Abstract Design. (3) I and II. Mr. Rosenquist
 Enrollment limited by laboratory facilities.
 Prerequisite: some advanced design experience and consent of instructor.
 Basic elements of three-dimensional space from low relief to full round and mobile forms. Laboratory problems executed in simple techniques.
- *167. Sources of Industrial Design. (2) II. Mr. French
 Thought and effort important to the development of machine art from its inception during the Industrial Revolution.
- 175A-175B. Primitive and Folk Textiles. (2-2) Yr. Miss Gayton
 Textile arts in their historical and cultural settings.
 175A. Native America; Oceania; Indonesia.
 175B. Egypt; Persia; Peasant, Medieval, and Renaissance Europe.
 Either half of this course may be taken independently.
- 176A-176B. Textile Design. (2-2) Yr. Mrs. Miller, Mr. Rossbach
 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 1953-1954 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 instructor.
 Enrollment limited by laboratory facilities; preference will be given to students majoring in decorative art.
- 180A-180B. Survey of Expression in Materials. (3-3) Yr. Mr. Wellington
 A study of form as exemplified by significant objects made from metals,

* Not to be given, 1953-1954.

wood, glass, clay, etc. Either half of this course may be taken independently. Offered every other year.

- 193A-193B. Historic Costume. (3-3) Yr. Miss Gayton
Costumes of various times and places with reference to design, material, cultural factors, and contemporary arts.
193A. Native America; Indonesia; Asia.
193B. Classic Mediterranean; Medieval to Modern Europe.
Either half of this course may be taken independently.
- 195A. The Great Periods in Interior Design. (3) I. Miss Gladding
The study of the periods as applied to domestic interiors.
- 195B. American Decorative Art from the First Colonial Periods to 1850. Miss Gladding
(3) II.
Spanish, English, Dutch Colonial Periods, and the Federal Period. Lectures, with slides, from material in museum collections and private houses showing the work of the more significant artists, housewrights, and craftsmen.
- *196A-196B. Interior Design. (2-2) Yr. Beginning each semester. Mr. Wellington
Offered every other year.
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 (Mr. Rossbach in charge)
Prerequisite: senior standing in decorative art and a B average or higher in major courses. Candidates for the master's degree will be expected to consult with the graduate adviser concerning specific requirements.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- Seminars in Decorative Art. (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. Mr. French
Analytic and critical studies of selected phases of industrial design.
299. Directed Research. (2-4) I and II. The Staff (Mr. Wellington in charge)

* Not to be given, 1953-1954.

DRAMATIC ART

(Department Office, 1205 Dwinelle Hall)

Fred O. Harris, M.F.A., *Professor of Dramatic Art (Chairman of the Department)*.

Leslie J. Mahoney, M.A., *Assistant Professor of Dramatic Art.*

Hubert S. White, Jr., A.B., *Assistant Professor of Dramatic Art.*

John Barton, M.A., *Instructor in Dramatic Art.*

David S. Hawes, M.A., *Instructor in Dramatic Art.*

Seth Powers Ulman, Ph.D., *Instructor in Dramatic Art.*

Letters and Science List.—All undergraduate courses are included in the Letters and Science List, except the following: courses 190, 191, 192, and 193. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Harris.

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 140A-140B (3-3), English 114A-114B (3-3), 117A-117B (3-3), 117E (3), Classics 103 (3), 108 (3), Spanish 105 (3), 109A-109B (2-2), 111A-111B (2-2), French 115A-115B (2-2), 120A-120B (2-2), German 104 (3), 106 (3), 109 (3), Italian 100 (3), Scandinavian 106 (3), 107 (3), Slavic 135 (2).

(D) Recommended Courses: Lower Division: Classics 34 (2), 35 (2), English 1A-1B (3-3), Music 27A-27B (3-3), Speech 2A-2B (3-3). Upper Division: Classics 178 (2), Philosophy 136A-136B (3-3), course 407 (3).

The University Theater

Under the direction of the Department of Dramatic Art, the University Theater presents a major and a studio series of play productions. These presentations have a twofold purpose: (1) to present to the University community a program of distinguished dramas of all times and all countries; (2) to afford the students in the University an effective experience in dramatic art. Participation in the presentations is open to all students.

The studio theater in Dwinelle Hall provides facilities for an extensive and varied program of student experiments in acting, playwriting, and directing.

LOWER DIVISION COURSE

10A-10B. Theory of Acting. (3-3) Yr. Beginning each semester.

Mr. Barton, Mr. Harris, Mr. Hawes, Mr. Mahoney

UPPER DIVISION COURSES

Group A. Dramatic Art: Theory and Practice

Not more than 6 units from courses 190, 191, 192, and 193 will be credited toward the major.

120. Theory of Stage Design. (3) II. Mr. Harris
130. Advanced Theory of Acting. (3) Mr. Barton, Mr. Hawes
Prerequisite: course 10A-10B, and consent of instructor.
- *130A. Greek Drama. (3) II. _____
- 130B. Shakespearean Drama. (3) I and II. Mr. Barton
- 130C. Seventeenth- and Eighteenth-Century Drama. (3) I. Mr. Hawes
Mr. Hawes
- 130D. Modern Drama. (3) II. Mr. Hawes
135. Theory of Directing. (3) I. Mr. Barton
- 152A-152B. Creative Playwriting. (3-3) Yr. Beginning each semester. Mr. White
Prerequisite: upper division standing and consent of the instructor.
- 160A-160B. Dramatic Theory. (3-3) Yr. Mr. Ulman
160A is not prerequisite to 160B.
190. Laboratory Projects in Acting. (1-6) I and II. The Staff (Mr. Mahoney in charge)
Prerequisite: courses 10A-10B, 407, and consent of the department.
191. Laboratory Projects in Directing. (1-6) I and II. Mr. Harris
Prerequisite: courses 10A-10B, 120, 135, 407, and consent of instructor.
192. Laboratory Projects in Stagecrafts. (1-6) I and II. The Staff (Mr. Harris in charge)
Prerequisite: courses 10A-10B, 120, and consent of the department.
193. Laboratory Projects in Playwriting. (1-6) I and II. Mr. White
Prerequisite: course 152A-152B and consent of instructor.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Harris in charge)
407. Speech for the Stage. (3) I and II. Mr. Mahoney
Prerequisite: course 10A-10B, and consent of instructor.

Group B. Dramatic Literature and History of Drama

The attention of the student is directed to the Group Major in Dramatic Literature described in the CIRCULAR OF INFORMATION.

UPPER DIVISION COURSES

- 140A-140B. The Theater in Western Civilization. (3-3) Yr. Mr. Ulman
140A is not prerequisite to 140B.

RELATED COURSES IN OTHER DEPARTMENTS

- Classics 35. Greek Tragedy. (2) I.
(Given in English.)

* Not to be given, 1953-1954.

- Classics 135. Greek and Roman Comedy. (2) II.
(Given in English.)
- English 114A-114B. The English Drama. (3-3) Yr.
English 117A-117B. Shakespeare. (3-3) Yr.
English 117E. Shakespeare. (3) I.
- *French 115A-115B. Modern French Drama. (2-2) Yr.
French 120A-120B. The Seventeenth Century. (2-2) Yr.
Greek 103. Drama. (3) II.
- German 104. Dramas of the Nineteenth Century. (3) II.
German 106. Schiller's Dramas. (3) I.
German 109. Goethe's Verse Dramas. (3) II.
- *Italian 100. Survey of Modern Drama from Goldoni to the Present. (3) II.
- Latin 108. Roman Comedy. (3) I.
- Scandinavian 106. History of Scandinavian Drama. (3) I.
(Given in English.)
- Scandinavian 107. The Plays of Ibsen. (3) II.
(Given in English.)
- Scandinavian 109. Scandinavian Drama of the Twentieth Century. (3) II.
- Slavic 135. The Russian Drama. (2) I.
(Given in English.)
- Spanish 105. Modern Peninsular Drama: From the Romantic Movement to the Present. (3) I.
- Spanish 109A-109B. The Spanish Drama of the Sixteenth and Seventeenth Centuries. (2-2) Yr.
- *Spanish 111A-111B. Cervantes. (2-2) Yr.

ECONOMICS

(Department Office, 119 South Hall)

- Joe S. Bain, Jr., Ph.D., *Professor of Economics.*
Robert A. Brady, Ph.D., *Professor of Economics.*
- ¹ Norman S. Buchanan, Ph.D., *Professor of Economics.*
John B. Condliffe, Sc.D., LL.D., *Professor of Economics.*
- ² William L. Crum, M.A., Ph.D., Sc.D. (hon.c.), *Professor of Economics.*
Malcolm M. Davison, J.D., Ph.D., *Professor of Economics.*
Howard S. Ellis, Ph.D., LL.D., *Flood Professor of Economics.*
Robert A. Gordon, Ph.D., *Professor of Economics.*
Ewald T. Grether, Ph.D., LL.D., *Flood Professor of Economics.*
Charles A. Gulick, Ph.D., *Professor of Economics.*
Emily H. Huntington, Ph.D., *Professor of Economics.*
Frank L. Kidner, Ph.D., *Professor of Economics.*
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 (Chairman of the Department).*
Ira B. Cross, Ph.D., LL.D., *Flood Professor of Economics, Emeritus.*
Stuart Daggett, Ph.D., *Flood Professor of Transportation, Emeritus.*
Lucy W. Stebbins, A.B., Litt.D., *Professor of Social Economics, Emeritus.*
Robert Dorfman, Ph.D., *Associate Professor of Economics.*
Earl R. Rolph, Ph.D., *Associate Professor of Economics.*

* Not to be given, 1953-1954.

¹ In residence fall semester only, 1953-1954.

² In residence spring semester only, 1953-1954.

George F. Break, Ph.D., *Assistant Professor of Economics.*
 Hans J. Brems, Ph.D., *Assistant Professor of Economics.*
 Gregory Grossman, Ph.D., *Assistant Professor of Economics.*
 Forest G. Hill, Ph.D., *Assistant Professor of Economics.*
 Donald R. Hodgman, Ph.D., *Assistant Professor of Economics.*
 Harvey Leibenstein, Ph.D., *Assistant Professor of Economics.*
 John M. Letiche, Ph.D., *Assistant Professor of Economics.*
 Peter O. Steiner, Ph.D., *Assistant Professor of Economics.*
 Michael Gort, M.A., *Associate in Economics.*
 Edward S. Herman, Ph.D., *Associate in Economics.*
 Robert M. Robinson, Ph.D., *Associate in Economics.*



Charles C. Abbott, Ph.D., *Visiting Professor of Finance for the fall semester.*
 David A. Alhadeff, Ph.D., *Assistant Professor of Business Administration.*
 William J. Baumol, Ph.D., *Visiting Associate Professor of Economics for the spring semester.*
 Alford A. Carleton, Ph.D., *Visiting Professor of Political Science for the spring semester.*
 Griffith C. Evans, Ph.D., *Professor of Mathematics.*
 Edward R. Hawkins, Ph.D., *Visiting Professor of Marketing.*
 Choh-Ming Li, Ph.D., *Associate Professor of Business Administration.*
 Hermann L. Meyer-Lindenberg, Ph.D., *Lecturer in Economics.*
 Arthur M. Ross, Ph.D., *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 7.

Departmental Major Advisers.—Mr. Hill, Chairman; Mr. Break, Mr. Hodgman, Mr. Kidner, Mr. Dowd, Mr. Robinson, Mr. Rolph.

Preparation for the Major.—Required: courses 1A-1B and 2, and a minimum average grade of C in these courses. Recommended: course 10, Business Administration 1A-1B, and at least an introductory course in another social science (6 units in political science, history, or sociology and social institutions preferred). It is recommended that students who intend to make economics their major complete courses 1A-1B and 2 by the end of their sophomore year.

The Major.—Required: 24 units of upper division economics. Courses 100A-100B (6); 110, 112, or 113 (3); and 135 (3) are required and should be taken in the junior year. (Course 135 should be taken before course 100B.) The remaining 12 units shall be selected by the student with the advice and approval of a departmental major adviser. The selection shall contain at least one two-semester sequence of courses, in order to ensure that each student shall have a significant degree of emphasis and depth in a particular field beyond the introductory semester. A course (3 units) in another department may be included among the 12 units, if it is approved by the Chairman of the Major Advisers' Committee as appropriate to the student's program.

It is strongly recommended that each student elect upper division courses in other related social sciences. Except under extraordinary circumstances, no more than 9 units of economics and business administration combined may be taken in one semester.

The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses taken in satisfaction of the major requirement. Students who do not maintain a C average may be required at any time to withdraw from the major in economics.

Economics majors on the Honors List of the College of Letters and Science are encouraged to enroll in Course 199 for special study, or to ask admission to a graduate course (with permission of the instructor concerned) during their senior year.

LOWER DIVISION COURSES

- 1A-1B. Elements of Economics. (3-3) Yr. Beginning each semester.

Mr. Gordon, Mr. Grossman, Mr. Kidner, Mr. Robinson

Prerequisite: 1A is prerequisite to 1B.

Two lectures; one weekly recitation section to be arranged.

2. Economic Statistics. (3) I and II.

Mr. Break, Mr. 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. Bain, Mr. Gort, Mr. Hill, Mr. Hodgman, Mr. Leibenstein, Mr. Steiner

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. Letiche

102. Advanced Economic Theory. (3) II.

Mr. Leibenstein

Prerequisite: course 100A-100B.

Analysis of the determinants of the aggregate level of output and employment, and of the allocation of resources. Includes advanced value and distribution theory, and a brief review of modern monetary theory.

104. Economic Policy. (3) I and II.

Mr. Buchanan, Mr. Landauer

Open to all qualified upper division students with consent of instructor.

Primarily for non-majors in Economics.

105. Economics of Consumption. (3) I.

Miss Huntington

A general survey of consumption in the United States, with an analysis of the determination of consumer demands, and of the relation of the consumer to the price systems.

- 106A-106B. Social Reform Movements. (3-3) Yr. Mr. Landauer
 106A. European and American movements for social reform prior to 1914.
 106B. European and American movements for social reform since 1914.
110. Economic History since 1850. (3) I. Mr. Knight
 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. Grossman
113. Economic History of the United States. (3) I and II. Mr. Mosk
114. Economic Problems of Latin America. (3) I and II.
 Mr. Mosk, Mr. Meyer-Lindenberg
115. Economic Problems of the Far East. (3) I and II. Mr. Li
118. Economic Problems of Soviet Russia. (3) I and II.
 Mr. Grossman, Mr. Hodgman
 The Soviet economic inheritance and economic developments in Soviet Russia from 1917 to the present; Soviet agriculture, industry, trade, labor, planning, financial and price systems; analysis of the role of wages, prices, interest, profit, and investment in the Soviet economic system.
119. Economic Problems of Africa. (3) II. Mr. Mosk
- 121A-121B. Industrial Organization. (3-3) Yr. Mr. Bain
 The organization and structure of industries and their markets in the American economy, competitive behavior, price policy, and market performance in such industries; public policy in the regulation of industry.
122. Theory of Domestic Trade. (3) II. Mr. Hawkins
 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. Economics of Regulation and Control. (3) I and II. Mr. Gort
 The role of government in the regulated sectors of the American economy; economic criteria for efficient control of prices, production, and the flow of investment funds.
- 130A-130B. Public Finance and Taxation. (3-3) Yr. Beginning each semester.
 Mr. Break, Mr. Davisson, Mr. Rolph
 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. Break
 Prerequisite: courses 135 and 100A or Business Administration 100.
 It is recommended that this course be taken in the senior year.

135. Money and Banking. (3) I and II.
Mr. Abbott, Mr. Alhadeff, Mr. Herman, Mr. Hodgman, Mr. Kidner
Primarily for juniors.
Monetary and banking institutions; monetary theory, international
monetary relations, monetary policy.
137. Money, Banking and Monetary Policy. (3) II. Mr. Ellis
Prerequisite: course 135.
Analysis of the monetary system of the United States and of other
countries; problems involved in monetary management, evaluation of pro-
grams for monetary and banking reform.
142. Economic Statistics. (3) I and II. Mr. Crum, Mr. Herman
I: Mr. Herman; II: Mr. Crum.
Prerequisite: course 2 or the equivalent.
150. Labor Economics. (3) I and II. Mr. Ross, Mr. Gulick
The social background of labor legislation and trade unionism.
Students will not receive credit for both course 150 and Business Admin-
istration 150.
152. Labor Economics. (3) I. Mr. Gulick
Comparative survey of American and foreign labor movements.
180. Problems of Poverty. (3) I. Miss Huntington
Facts, conditions, and current explanations of poverty; public and
private action to prevent destitution; theories concerning minimum stand-
ards of living.
185. Social Insurance. (3) II. Miss Huntington
An analysis of the theories underlying social insurance and social in-
surance legislation throughout the world.
- 188A-188B. The Economics of Population Change. (3-3) Yr. Mr. Leibenstein
History, determinants, and economic consequences of population
growth; life tables, reproduction rates, and other demographic measures;
problems of population forecasting; relationships of population changes to
employment, investment, and the development of underdeveloped areas.
- 190A-190B. International Economic Relations. (3-3) Yr. Beginning each
semester. Mr. Condliffe, Mr. Letiche
Fundamental factors in international economic relations.
197. Problems in International Economic Relations. (3) II. Mr. Letiche
Prerequisite: course 190A-190B.
Research in problems of international economic policy for advanced
undergraduate students.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
Mr. Hodgman, Mr. Landauer
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 in-
structor. Undergraduate courses are not prerequisite to graduate courses,
except where indicated.

- 200A-200B. Advanced Economic Theory. (3-3) Yr.
Mr. Baumol, Mr. Brems, Mr. Dorfman
National income analysis, macro-economics; demand and cost theory;
income distribution; theory of employment.
200A. I: Mr. Brems, Mr. Dorfman.
200B. II: Mr. Baumol, Mr. Dorfman.

- 201A-201B. History of Economic Thought. (3-3) Yr. Mr. Brady
 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. Baumol
 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. Brems
205. Theory of Economic Change and Development. (3) I. Mr. Hill
 Theory of economic change; relation of such theories to general economic theory. Institutional patterns of development; changes in resource and product composition.
- 206A-206B. Social Reform Movements. (3-3) Yr. Mr. Landauer
207. Mathematical Methods of Economics. (3) II. Mr. Dorfman
 The study of theoretical economics with reference to methods of mathematical formulations.
- *208. Mathematical Economics. (3) II. Mr. Evans
 Prerequisite: Mathematics 121.
210. Seminar in Economic History. (3) II. 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) II. Mr. Mosk
- 217A-217B. Problems in Economic Planning. (3-3) Yr. Mr. Brady
 217A. General theory of economic planning.
 217B. Study of economic planning in different countries.
218. Seminar on the Soviet Economy. (3) II. Mr. Hodgman
 Prerequisite: course 118 and reading knowledge of Russian. Consent of the instructor required.
 Problems in research and analysis.
- 221A-221B. Industrial Organization. (3-3) Yr. Mr. Bain
 The organization and structure of the American enterprise economy, with special reference to manufacturing and processing industries. Competitive behavior, price policy, and workability of competition in such industries.
- 230A-230B. Public Finance. (3-3) Yr. Mr. Rolph, Mr. Break
 Public finance and taxation theory; public debt and fiscal policy; public policy with respect to taxation.
231. 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.
 Mr. Gordon

* Not to be given, 1953-1954.

- *234. Business Conditions, Domestic and Foreign. (3) II. Mr. Kidner
Prerequisite: course 233A-233B, or consent of instructor.
A seminar involving practice in analyzing business conditions in the United States and reviewing recent developments in foreign countries.
- 235A-235B. Advanced Money and Banking. (3-3) Yr. 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
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. Break, Mr. Dorfman
240A. Statistical theory as applied to economics.
240B. Application of statistical techniques.
241. Statistical Methods of Social Investigation. (3) II. Miss Huntington
- 250A-*250B. Advanced Labor Economics. (3-3) Yr. Mr. Gulick
250A: I and II.
Prerequisite: two courses in labor, including some European labor history, and consent of instructor. Course 250A is not prerequisite to 250B.
An intensive reading course covering classic and current material.
- 252A-252B. Seminar in Labor Economics. (3-3) Yr. Mr. Gulick, Mr. Taylor
Section 1, Mr. Gulick, deals with labor in industry.
Section 2, Mr. Taylor, deals with labor in agriculture, domestic and foreign.
Credit may be given for work in each section.
- 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 and II.
Mr. Carleton, Mr. Condliffe
Open to graduate students in any department.
I: Research on current problems of international economic interest.
Mr. Condliffe
II: American Policy toward the Peoples of the Near and Middle East.
Mr. Carleton, Mr. Condliffe
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. _____
 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. Davisson
 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

(Department Office, 207 Haviland Hall)

- William A. Brownell, Ph.D., LL.D., *Professor of Education (Chairman of the Department)*.
- Guy T. Buswell, Ph.D., LL.D., *Professor of Education*.
- Harold D. Carter, Ph.D., *Professor of Education*.
- Luther C. Gilbert, Ph.D., *Professor of Education*.
- George C. Kyte, Ed.D., *Professor of Education*.
- John U. Michaelis, Ph.D., *Professor of Education*.
- Edgar L. Morphet, Ph.D., *Professor of Education*.
- ²J. Cecil Parker, Ed.D., *Professor of Education*.
- Theodore L. Reller, Ph.D., *Professor of Education*.
- David H. Russell, Ph.D., *Professor of Education*.
- Frederick T. Tyler, Ph.D., *Professor of Education, Department Executive Officer*.
- Edna W. Bailey, Ph.D., *Professor of Education and Associate Director of Supervised Teaching, Emeritus*.
- Frank N. Freeman, Ph.D., LL.D., D.Sc., *Professor of Educational Psychology, Emeritus*.
- Frank W. Hart, Ph.D., LL.D., *Professor of Education, Emeritus*.
- Merton E. Hill, Ed.D., *Professor of Education, Emeritus*.
- George A. Rice, Ed.D., *Professor of Education, Emeritus, and Director of Supervised Teaching, Emeritus*.
- Lester A. Williams, Ph.D., *Professor of Education, Emeritus*.
- Lars H. Peterson, Ph.D., *Associate Professor of Education, Emeritus*.
- ¹Glenn E. Barnett, Ed.D., *Associate Professor of Education and Director of the University Elementary School*.
- Bertrand Evans, Ph.D., *Associate Professor of English and Education*.
- Clifford P. Froehlich, Ed.D., *Associate Professor of Education*.
- Jack A. Holmes, Ph.D., *Associate Professor of Education*.

* Not to be given, 1953-1954.

¹ In residence fall semester only, 1953-1954.

² In residence spring semester only, 1953-1954.

- Mary C. Jones, Ph.D., *Associate Professor of Education.*
 Frederic Lilge, Ph.D., *Associate Professor of Education.*
 S. E. Torsten Lund, Ph.D., *Associate Professor of Education.*
 Arthur H. Brayfield, Ph.D., *Assistant Professor of Education.*
 Howard S. Bretsch, Ph.D., *Assistant Professor of Education.*
 Thomas B. Edwards, Ph.D., *Assistant Professor of Education.*
 Walter D. Loban, Ph.D., *Assistant Professor of Education.*
 Jack London, Ph.D., *Assistant Professor of Education.*
 Richard D. Mosier, Ph.D., *Assistant Professor of Education.*



- Clinton C. Conrad, Ph.D., *Lecturer in Education and Director of Supervised Teaching.*
 Enoch Dumas, Ed.D., *Lecturer in Education, Associate Director of Supervised Teaching, and Supervisor of Elementary Education.*
 Laurence F. Foster, Ph.D., *Lecturer in Education and Supervisor of Audio-Visual Education.*
 John E. French, Ph.D., *Supervisor of Art Education in the Elementary School and Assistant Professor of Decorative Art.*
 Mabel F. Gifford, A.B., *Lecturer in Education for the spring semester.*
 Margaret B. Hanson, M.A., *Lecturer in Education and Supervisor of the Teaching of Home Economics.*
 M. Ray Hitch, M.A., *Lecturer in Education and Supervisor of the Teaching of Business Education.*
 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.*
 Herman A. Spindt, Ph.D., *Lecturer in Education.*
 David VanderSlice, M.D., *Lecturer in Education.*



- Marilyn H. Anderson, M.A., *Supervisor of Elementary 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.*
 Ruby L. Hill, M.A., *Assistant Supervisor of Elementary Education.*
 Harry H. Hindman, A.B., *Supervisor of the Teaching of Physical Education for Boys.*
 James W. Hoge, M.A., *Supervisor of the Teaching of Mathematics.*
 Katharyn Hole, *Supervisor of the Teaching of Art.*
 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.*
 Margaret Ryan, M.A., *Supervisor of the Teaching of English and Speech.*
 Karl E. Schevill, Ph.D., *Supervisor of the Teaching of Foreign Languages.*
 James R. Squire, M.A., *Supervisor of the Teaching of English.*
 Josie W. Stewart, M.A., *Supervisor of the Teaching of Kindergarten Work.*

Olive Stewart, M.S., *Supervisor of the Teaching of Social Studies.*

Portia F. Wagenet, A.B., *Supervisor of the Teaching of Physical Education for Girls.*

Rosalie V. Zari, M.A., *Supervisor of Junior High School and Elementary Education.*

Letters and Science List.—Courses 108, 110, and not more than 3 units from 101, 102, and 105 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. W. A. Brownell and Mr. F. T. Tyler.

Preparation for the Major.—Psychology 1A and Zoölogy 10, and not less than 6 units in economics (preferably 1A-1B) or political science (preferably 1, 2) or sociology and social institutions (preferably 100A-100B) or philosophy (preferably 6A-6B).

The Major.—The major here described is the 24-unit major for the A.B. degree in the College of Letters and Science. *A major in education is not an acceptable major for a Certificate of Completion of the teacher-training curricula.*

Required: 18 units in education including the following 11 units: Education 101, 106, 110, 119, and a sequence of courses consisting of one of the following groups with additional courses from the remaining groups sufficient to make a total of 7 units.

- I. History of Education, courses 102; 105.
- II. Educational Psychology, courses 111; 115 or 116 or 117 or 118.
- III. Elementary Education: courses 130; 118; 134 or 138.
- IV. Vocational Education: courses 160; 161 or 162; 164.
- V. Secondary Education: courses 170; 117 or 172.
- VI. Social Education: course 111.

The remaining 6 units may be chosen, with the approval of the department, from upper division courses in the Letters and Science List in the following departments: Economics, Education, History, Philosophy, Political Science, Psychology, or Zoölogy. Students who transfer from normal schools or teachers colleges will not be permitted to elect courses in education for these 6 units. It is recommended that students include Philosophy 104 in the major program. Courses numbered in the 300 series are not accepted toward the major for the A.B. degree.

The department will certify to the completion of a major for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain this average may be required at any time to withdraw from the major in education.

TEACHER-TRAINING CURRICULA

Special provision is made for the professional training of teachers of two classes:

A. Those preparing to become teachers in elementary and secondary schools or in colleges.

B. Those preparing to engage in school administration or supervision, to become principals or superintendents of public schools, or to teach in teachers' college or in college departments of education.

For detailed requirements see ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

For courses offered at Davis see GENERAL CATALOGUE, DEPARTMENTS AT DAVIS.

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) II. Mr. Lilge
Education as an instrument of political power and propaganda; its dependence on national cultural traditions. Especially valuable to students pursuing the study of a specific region.
106. Philosophy of Education. (2) I and II. Mr. Lilge
The great educational classics and their meaning for modern man.
- *108. Universities in the Modern World. (2) I. _____
Various ideas of a university and their implications for general education, professional training and social service; philosophical and comparative analysis.
110. Introduction to Educational Psychology. (3) I and II.
Mr. Buswell, Mr. Carter, Mr. Gilbert, Mr. Holmes
Original nature and tendencies of man; the learning process; individual differences and their measurement.
111. Growth and Development of Children. (2) I and II.
Prerequisite: course 110. Mrs. Jones, Mr. Tyler
The processes through which the normal human being reaches maturity, acquires effective use of his bodily equipment and learning capacity, and makes satisfactory personal and social adjustments. Directed observation of normal children.
112. The Improvement of Reading in Schools. (2) II. Mr. Buswell
Psychology of learning as it relates to effective reading readiness programs, development of word meaning, organization and analysis, improvement of comprehension, recall, skimming and speed reading, study skills and higher mental processes, provision for individual differences in ability and interest, place of skills in modern reading program.
114. Statistical Methods in Education. (2) I. Mr. Carter
Prerequisite: course 110. Mathematics D is also recommended.
- *115. Objective Tests and Measurements. (2) I. Mr. Carter
Prerequisite: course 110 or equivalent, and 114.
Principles and functions of measurement in education; varieties of measurement in common use; the construction and validation of objective examinations; the improvement of school marks.
116. The Exceptional Child. (2) I. Mr. Holmes
Prerequisite: course 110 or a course in psychology additional to Psychology 1A.
117. Psychology of High School Subjects. (2) I and II. Mr. Gilbert
Prerequisite: course 110.
A psychological analysis of the various subjects of the high school curriculum with a survey of psychological experiments.

* Not to be given, 1953-1954.

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.
- *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, Mr. Michaelis
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 and II.
Prerequisite: courses 110 and 130. Mr. Dumas
Objectives, standards of attainment, and types of instruction in arithmetic, oral and written English, spelling, and penmanship; diagnostic and remedial techniques; criteria for selection, placement, and organization of the content of these subjects.
132. Art and Music in the Elementary School. (2) I and II.
Prerequisite: courses 110 and 130. Mr. French in charge, Mr. Kyme
Enrollment limited to facilities available.
Functions, organization, instructional planning, implications of research in child development for teaching and selection of materials, and evaluation of educational outcomes in the art and music curricula in elementary schools.
134. Reading and Literature in the Elementary School. (2) I and II.
Prerequisite: courses 110 and 130. Mr. Russell
Objectives, standards of attainment, types of reading instruction, diagnostic and remedial techniques, reading readiness, place of reading in the activity program. Introduction to children's literature, children's interests in reading, criteria for selection of content, the place of supplementary and library reading.
138. Social Studies in the Elementary School. (2) I and II. Mr. Michaelis
Prerequisite: courses 110 and 130.
Aims, content, and outcomes; unified social studies versus separate courses; critical analysis of typical units and courses of study; selection, sequence, and organization of units; the place of textbooks and supplementary materials; relation to the Three R's, the arts, and elementary sciences.
149. See under *Special Education*, page 106.
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.

* Not to be given, 1953-1954.

- *152. Health Problems in the Secondary Schools. (2) I. _____
153. Mental Hygiene—Elementary. (2) I. Mrs. Jones
Prerequisite: course 110.
A basic course concerned with problems of childhood.
- *154. Mental Hygiene—Advanced. (2) I. _____
Prerequisite: course 153 or equivalent.
160. Vocational Education. (2) I. Mr. Moore
Philosophy and organization of vocational education of less than college grade, with particular reference to principles underlying education for industry, agriculture, commerce, homemaking, and continuation education.
161. Occupational and Educational Information. (2) I. Mr. Brayfield
Lecture and laboratory.
Labor market organization and dynamics; job analysis and community occupational surveys; investigation of training opportunities. Sources and interpretation of data.
162. Occupational Testing. (2) I and II. Mr. Brayfield
Prerequisite: course 114 or 119.
Theory and practice in occupational testing; emphasis upon aptitude, interest, and personality measures; validity, reliability, and normative data. Supervised work in test administration, scoring, and interpretation.
164. Introduction to Student Personnel Work. (2) I and II. Mr. Froehlich
Nature and scope of the student personnel program in schools and colleges; role of teacher, counselor, and administrator. Survey of basic tools and techniques.
165. Business Education in Secondary Schools. (3) I and II. Mr. Hitch
This course is prerequisite to 320E, Section 13.
166. Home Economics Education. (3) I and II. Mrs. Hanson
Designed for teachers, student dietitians, and nutritionists in public health.
170. Secondary Education. (2) I and II. Mr. Lund, Mr. Loban, Mr. Edwards
Prerequisite: courses 110 and 111; ordinarily juniors will not be admitted. (These requirements will be administered without exception for all University of California students. Graduates from other institutions may take the prerequisites together with the course, but are advised that this will be a decided handicap.)
172. Junior High School Education. (2) I. Mr. Loban
Prerequisite: course 110 (may be taken concurrently).
174. Reading and Literature at the Secondary Level. (2) II. Mr. Loban
A survey of the literature read by adolescents, together with an examination of their reading problems and interests; an analysis of reading as employed in subject-matter areas other than English; an evaluation of relevant research with application to the classroom.
181. Adult Education. (3) I and II. Mr. London
The functions and possibilities of adult education in our society. The resources available to those who do educational work with adults in public schools and other community agencies. The role of the public schools in facilitating coöperation among these agencies.

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

GRADUATE COURSES

As a condition for enrollment in a graduate course the student must submit to the instructor in charge of the course satisfactory evidence of preparation for the work proposed; adequate preparation will consist normally of the completion of at least 12 units of upper division work basic to the subject of the graduate course.

The admission of undergraduates to graduate courses is limited to seniors who have an average grade of at least B in the basic courses; the study-list limits in such cases are the limits imposed by the rules of the Graduate Division.

- 200A. The School in the Social Order. (3) I and II. Mr. Mosier
A study of the interrelations of the school and society, of the complexity of the culture in which education functions, and of the political and social relations of the school to contemporary American society.
- 200B. Psychological Foundations of Education. (3) I. Mr. Brownell
(Formerly numbered 210A.)
Prerequisite: 8 units in Educational Psychology and/or Psychology.
A systematic course designed to organize and to integrate the field of Educational Psychology at an advanced level.
- 200C. Foundations of Curriculum Development. (3) II. Mr. Parker
A basic course in the general concepts, principles and practices of curriculum development, and the construction and evaluation of specific curricula.
- 200D. Public School Organization and Administration. (3) II. Mr. Bretsch
The principles and practices of educational administration with respect to the teacher and the administrative personnel, state and local administrative organization, finance and business procedures, public relations. (Enrollment restricted to non-majors in administration.)
- 201A-*201B. History of Education. Seminar. (2-2) Yr. Mr. Mosier
Admission on consultation with 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. Lilge
Admission on consultation with the instructor.
209. Philosophical Issues in Contemporary Education. (2) I. Mr. Lilge
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. The Learning Process. (2) I. Mr. Buswell
Prerequisite: consent of instructor.
Limited to human learning and directed particularly to problems of school learning in the areas of skills, concept formation, problem solving, and aesthetic appreciation. Doctoral candidates in Educational Psychology may not register for this course.

* Not to be given, 1953-1954.

211B. Children's Thinking. (2) II.

Mr. Russell

Prerequisite: consent of instructor.

A study of children's learning and thinking from the developmental point of view, with particular reference to the influence of the home and the school; the role of perceptual and emotional factors in children's thinking; the development of children's concepts, problem-solving abilities, and creative thinking.

*212. Analysis of Difficulties in Reading and Language Arts. (2) II.

Mr. Buswell

Clinical procedures in the study of pupils who are failing in reading, spelling, and oral and written composition; various types and causes of failures; use of educational and psychological tests and informal analyses; corrective methods.

213. Individual Intelligence Tests in Guidance. (2) I.

Mr. Holmes

Prerequisite: course 110, 111, 114, and consent of instructor.

A critical analysis of the history and techniques of individual intelligence testing. Individual intelligence tests and their use in assaying various intellectual components.

*214A. Advanced Statistics with Application to Methods of Educational Investigation. (2) I.

Mr. Carter

Prerequisite: a course in elementary statistics and consent of instructor.

For students conducting investigations involving statistical analysis, or expecting to teach tests and measurements and statistical methods in colleges.

215. Advanced Educational Psychology.

Prerequisite: consent of instructor.

A systematic and critical appraisal of the scientific literature of the field.

215A. Principles and Theories of Psychological Measurement. (4) I.

Mr. Carter

The development and application of methods of measuring human behavior, including intelligence, interests, attitudes, adjustment, etc. Primarily for doctoral candidates in Educational Psychology.

*215B. Psychology of Learning. (4) I and II.

Mr. Buswell

Learning and learning theory. Primarily for doctoral candidates in Educational Psychology.

215C. Human Development: Individual Differences. (4) I.

Mr. Tyler

The facts, principles, and generalizations concerning the nature of, and the factors related to, individual differences in human growth and development. Primarily for doctoral candidates in Educational Psychology.

215D. Human Development: Personal and Social Adjustment. (4) II.

Mrs. Jones

Factors in personal-social relationships, patterns of adjustment and mature behavior, parent-teacher relationships and resources for guiding normal personality development. Primarily for doctoral candidates in Educational Psychology.

216A-216B. Educational Psychology. Seminar. (2-2) Yr.

Mr. Buswell, Mr. Carter, Mr. Tyler, and the Staff

* Not to be given, 1953-1954.

- 217A. Experimental Education. (2) I and II. Mr. Gilbert
Admission on consultation with instructor.
Laboratory experiments, with special reference to the more elaborate techniques applied to the various school subjects. The course includes voice recording, photographing eye movements in reading and spelling, analysis of rhythm in reading, arithmetic, and writing, and studies of the motor responses accompanying appreciation. Each member of the class will participate in all experiments.
- 217B. Experimental Education. (2) II. Mr. Gilbert
Prerequisite: course 217A.
Students will be expected to complete an advanced laboratory project.
- 218A-218B. Investigations in Language Arts Education. (2-2) Yr. Mr. Russell
Prerequisite: consent of instructor.
A study of available and needed research in selected areas of the language arts. Some emphasis will be given to topics such as communication in modern life, child development in language abilities, language and thought, interrelationships of language and personality and curricular problems in the language arts. Students will work intensively in one area of special interest.
- *219. Investigations in Arithmetic Education. (2) II. Mr. Brownell
Prerequisite: consent of 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 instructor.
- *226. Curriculum Construction. (2) II. Mr. Parker
- *227. Problems in Curriculum Development Practicum. (2) I. Mr. Parker
Prerequisite: two courses in elementary and/or secondary curriculum, teaching experience, graduate standing, and consent of instructor.
Designed especially for teachers, principals, and superintendents who wish to make specific plans and develop materials for specific curriculum problems in their schools.
- *229. In-Service Programs for School Personnel. (2) II. Mr. Parker
Prerequisite: school experience.
Current practices, problems, principles, and procedures in in-service education programs for public school personnel with emphasis upon evaluation. Designed for principals, directors, supervisors, superintendents and for teachers with interest or responsibility for in-service education.
- 230A-*230B. Elementary Education Seminar. (2-2) Yr. Mr. Barnett
Prerequisite: 12 units in education with teaching experience and consent of instructor.
231. Administration of Elementary Education Practicum. (2) I and II. Mr. Kyte
Admission on consultation with instructor.
- 232A-232B. The Elementary School Curriculum Seminar. (2-2) Yr. Mr. Russell
Admission on consultation with instructor.
Current research and original investigation relating to the curriculum of the elementary school.

* Not to be given, 1953-1954.

- 233A-233B. Supervision of Elementary Education Practicum. (2-2) Yr.
Admission on consultation with instructor. Mr. Kyte
- 234A-234B. Supervision of Elementary Education Seminar. (2-2) Yr.
Admission on consultation with instructor. Mr. Kyte
235. The Elementary School Curriculum. (2) I and II. Mr. Kyte
Admission on consultation with instructor.
237. Trends in Elementary Education. (2) I. Mr. Barnett
Prerequisite: graduate standing and completion of at least 12 units in education.
A survey of current practices descriptive of the emerging elementary school in the United States with special attention to their implications for the student's own professional needs.
- 240A-240B. Educational Administration Seminar. (2-2) Yr.
Mr. Bretsch, Mr. Morphet, Mr. Reller
- 241A-241B. Introduction to Educational Administration. (4-4) Yr.
Prerequisite: consent of instructor. Mr. Morphet, Mr. Reller
A comprehensive introduction to the principles, practices and literature of educational administration. Required for the master's degree in educational administration and for various administrative credentials.
242. Advanced Study in the Theory and Practice of Educational Administration.
Prerequisite: Education 241A-241B and consent of instructor.
Designed to provide opportunity for advanced study in the theory and practice of educational administration at elementary, secondary and adult education levels. Opportunity will be provided for exhaustive study of the basic related disciplines and problems in the respective areas.
- 242A. Local, state, and federal organization; education and government; educational law. (2-4) I. Mr. Morphet
- 242B. Administration of educational programs and services; pupil personnel services. (2-4) II. Mr. Bretsch, Mr. Reller
- 242C. Administrative organization and personnel administration. (2-4) I. Mr. Bretsch
- 242D. Finance and business administration. (2-4) II. Mr. Morphet
- 242E. School-community relations and schoolhousing. (2-4) I. Mr. Reller
- 258A-258B. Social Studies Education Seminar. (2-2) Yr. Mr. Michaelis
Prerequisite: consent of instructor.
Research on problems in social studies education for advanced students.
- 260A-260B. Student Personnel Work Seminar. (2-2) Yr.
Mr. Brayfield, Mr. Froehlich
Prerequisite: course 164 and consent of instructor.
Research in the field of student personnel activities.
264. Organization and Administration of Student Personnel Services. (2) II.
Prerequisite: course 164 and consent of instructor. Mr. Brayfield
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.

266. Counseling Theory. (2) I. Mr. Froehlich
Prerequisite: courses 119, 161, 162, 164, and consent of instructor.
Basic counseling theory, schools of counseling, survey of counseling techniques.
267. Advanced Counseling. (2) II. Mr. Froehlich
Prerequisite: course 266 and consent of instructor. Restricted to doctoral candidates in the field of student personnel work.
Psychological foundations of counseling; diagnostic procedures and treatment; evaluation of counseling. Illustrative case materials.
- 270A-270B. Secondary Education Seminar. (2-2) Yr. Mr. Lund, Mr. Loban, Mr. Edwards
Admission on consultation with instructor.
- 272A. Secondary School Curriculum: Basic Principles. (2) I. Mr. Edwards
Prerequisite: courses 110, 111, 170, or their equivalent, graduate standing, and consent of instructor.
For advanced students who wish to make a thorough study of basic principles of curriculum development, with special reference to the secondary school.
- 272B. Secondary School Curriculum: Techniques of Curriculum Making. (2) II. Mr. Parker
Prerequisite: course 272A, graduate standing, and consent of instructor.
273. Supervision in Secondary Schools. (2) I and II. Mr. Edwards
Prerequisite: course 130 or 170, teaching experience, and consent of instructor.
The organization, function, and techniques of supervision with special reference to secondary schools.
275. Secondary Education: Survey. (2) I and II. Mr. Lund
Survey and critical review of secondary education literature, including research studies, yearbooks, reports, and other documents. Admission on consultation with instructor.
279. The Junior College Practicum. (2) I and II. Mr. Spindt
281. Adult Education Seminar. (2) I and II. Mr. London
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.
292. Research Techniques. Seminar. (2) I. Mr. Buswell
Research problems in education; historical and scientific methods; design of investigations; bibliographical techniques, statistical methods, survey methods, and laboratory techniques; methods of reporting results.
293. Surveys and Field Studies. (2) I. Mr. Bretsch
The theory, techniques, procedures, and results of surveys and field studies.
298. Directed Research. Seminar. (2-4) I and II. The Staff (Mr. Brownell in charge)
Admission only with consent of instructor in charge.
Open only to candidates for the Ph.D. and Ed.D. degrees who have passed the departmental qualifying examinations and who present an approved plan of research, and in special cases, to students who present evidence of qualifications and approved plans for carrying on a particular type of research.

313. School Psychologist Internship. (4) II. Mr. Holmes
Prerequisite: course 213 and the consent of instructor.
Four to eight hours per week will be spent in supervised field work in which interns will make case reports and will participate in case conferences and staff meetings concerned with diagnosis and prognosis and the formulation of remedial procedures.
325. Field Work in Student Personnel Services. (2) I and II. Mr. Brayfield
Prerequisite: course 164, and consent of instructor.
Supervised field work in schools and other community agencies.
340. Directed Field Study and Internship in Educational Administration. (2-4) II. Mr. Reller
Prerequisite: course 241A-241B, 293, and consent of instructor.

Supervised Teaching

Students must reserve a three-hour period daily. *Applications for admission* to these courses must have been made in Room 107, Haviland Hall, not later than April 6, 1953, for the fall semester, 1953; not later than November 2, 1953, for the spring semester, 1954; and not later than April 5, 1954, for the fall semester, 1954. Enrollment is limited to available facilities.

320. Secondary Supervised Teaching, Professional Methods. I and II. Mr. Conrad, and Supervisory Staff
The University of California will accept only those candidates who meet the requirements set up by the State Department of Education in health, including specifically sight and hearing, and will not admit to courses 320A and 320C inexperienced applicants who are over 35 years of age.
Education 320A, 320C, 320E, 323, 324, and 330C are scheduled as extra-session courses, to begin with the opening of the public schools and to end with the closing of the semester in the public schools. Thus teaching assignments in the fall semester, 1953, will begin on or about September 14 and end January 29. For the spring semester, 1954, they will begin on or about February 1 and end June 18. Students should make arrangements accordingly.
A limited number of internships in junior or senior high schools may be made available in the fall semester, 1953, or in the spring semester, 1954, for students who wish to enroll only in supervised teaching and methods courses in one semester and to spend practically all of their time during the school week in teaching and allied assignments in the public schools. Students should consult Mr. Conrad.

- 320A. Secondary Supervised Teaching. (3) I and II. Mr. Conrad, and Supervisory Staff
Lectures, conferences, observation, and supervised teaching.
Prerequisite: courses 110, 111, 170, 320B. Course 320E (major field) must be taken concurrently with course 320A. In order to enroll in Education 320A, students should meet the grade-point requirements listed above (page 99) and must have been admitted to the Graduate Division.
Note that this is an extra-session course, beginning and ending with the semester in the public schools (see above).
- 320B. Audio-Visual Instructional Materials and Techniques. (2) I and II. Mr. Foster
Lectures, conferences, demonstrations, laboratory experiences.
Prerequisite: course 110.
Course 320B should be taken in the semester preceding enrollment in 320A.

Theoretical and psychological factors; implications of research studies; operation of equipment; selection, evaluation, and utilization of materials; preparation of handmade slides, graphic displays, materials for opaque projection, duplicated and fugitive materials; the services offered teachers by the audio-visual departments of school systems.

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

Mr. Conrad, and Supervisory Staff

Conferences, observation, and supervised teaching.

Prerequisite: courses 110, 111, 170, 320A, 320B. Students must reserve a three-hour period daily.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 104).

320E. Methods of Teaching. (2) I and II.

Mr. Conrad, and Supervisory Staff

Lectures, conferences, and laboratory.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 104).

All students enrolled in 320A, 320C or 324 must carry concurrently one of the following sections:

Sec. 2. Life Science and Physical Science.

Mr. Polson

Sec. 3 Mathematics.

Mr. Hoge

Sec. 4. English.

Miss Ryan, Mr. Loban, Mr. Squire

Sec. 5. Foreign Languages.

Mr. Schevill

Sec. 7. Social Studies.

Mrs. 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. Hanson

Prerequisite: course 166.

Sec. 12. Music.

Mr. Kyme

Sec. 13. Business Education.

Mr. Hitch

Course 165 is prerequisite to supervised teaching in business education.

Sec. 16. Junior College.

Mr. Conrad

*Sec. 17 Special Education.

Admission on approval of instructor. Hours to be arranged.

School Library Administration (Librarianship 206).

Miss Boyd

This course is required of all applicants for the special secondary credential in public school librarianship; it must be taken in addition to course 320E to fulfill the requirements for the general secondary credential with major in Librarianship.

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.

Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 104).

* Not to be given, 1953-1954.

324. Junior College Supervised Teaching. (4) I and II. Mr. Conrad
 Conferences, observation, and supervised teaching.
 Prerequisite: course 170 or 279, which may be taken concurrently if circumstances require. Course 320E, Sec. 16, must be taken concurrently.
 Sec. 1. Limited to teaching assistants employed by the University.
 Sec. 2. Open to all other candidates for the Junior College Credential.
 For students enrolled in Section 2 this is an extra-session course, beginning and ending with the semester in the public schools (see page 104).
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.
 For students enrolled in Education 330C this is an extra-session course, beginning and ending with the semester in the public schools (see page 104).
- 330A. Introduction to Elementary Teaching. (2) I and II.
 Mr. Barnett, Mr. Michaelis
 Lectures, conferences, laboratory, and field work.
 Observations and participation in public school work. Students must reserve at least one two-hour period for field work each week.
- 330C. Elementary Supervised Teaching. (6) I and II.
 Mr. Dumas, and Supervisory Staff
 Prerequisite: courses 110, 111, 130, 131, 132, 134, 138, 330A; Decorative Art 6A; Music A, 27A; History 189A or 189B; Physical Education 26, Section on Elementary School Skills (or equivalents).
 Conferences, observation, and supervised teaching.
 Note that this is an extra-session course, beginning and ending with the semester in the public schools (see page 104).
- 330E. Methods of Teaching in Elementary School or Junior High School. (2) I and II.
 Mr. Dumas and Supervisory Staff
 Restricted to candidates for the General Junior High School Credential or for the General Elementary School Credential. Must be taken concurrently with course 330C.
331. Elementary Supervised Teaching: Materials of Instruction and Class Management. (2) I and II. Mr. Dumas in charge
 Restricted to candidates for the General Junior High School Credential or for the General Elementary School Credential. Must be taken concurrently with course 330C.

Special Education

- *149. Administration, Organization, and Procedures in Special Education. (2) I.
- *326. Supervised Teaching in Special Education. (4) II.
 Prerequisite: course 149, which may be taken concurrently if circumstances require. Course 320E, Sec. 17, must be taken concurrently with 326. Open only to candidates for a credential in special education and only after consultation with the instructor in charge of the course.

370. Speech Defects and Disorders with Corrective Techniques. (2) II.
Prerequisite: course 110. Mrs. Gifford
Designed to give students, teachers and administrators a broader understanding of the causes and treatment of speech defects and disorders. Includes classification of speech defects and disorders, theories of functional and organic disorders of voice and speech; the causes and treatment of stuttering and articulatory defects, and methods used in the speech correction classes in the public school in California.
- *379. Educational Treatment of Cerebral Palsied Children. (2) II. ———
Admission only on consultation with 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 328A. Methods of Teaching Vocal Techniques. (2) I.
Music 328B. Methods of Teaching Vocal Techniques. (2) II.
Music 329A. Methods of Teaching Stringed Instruments. (1) I and II.
Music 329B. Methods of Teaching Brass Instruments. (1) I.
Music 329C. Methods of Teaching Wood-Wind Instruments. (1) II.
Music 329D. Methods of Teaching Percussion Instruments. (1) I.
Music 329E. Ensemble: Literature for School Orchestra and Band. (1) II.

ENGINEERING

(Department Office, 218 Engineering Building)

- Everett D. Howe, M.S., *Professor of Engineering.*
Morrhough P. O'Brien, B.S., *Professor of Engineering (Chairman of the Department).*



- Herbert V. Wiley, B.S., *Lecturer in Engineering.*

CIVIL ENGINEERING AND IRRIGATION

(Division Office, 9 Engineering Building)

- Frank Baron, M.S., D.Sc., *Professor of Civil Engineering and Director of the Structural Engineering Laboratory.*
Harmer E. Davis, M.S., *Professor of Civil Engineering, and Director of the Institute of Transportation and Traffic Engineering.*
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 and Director of the Sanitary Engineering Laboratories.*
Bruce Jameyson, B.S., *Professor of Civil Engineering.*
Paul F. Keim, M.Sc., *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., Sci.D., *Professor of Civil Engineering.*
Egor P. Popov, Ph.D., *Professor of Civil Engineering.*

* Not to be given, 1953-1954.

- Thomas R. Simpson, B.S., *Professor of Irrigation Engineering (Chairman of the Division of Civil Engineering and Irrigation)*.
- * George E. Troxell, B.S., *Professor of Civil Engineering*.
- Raymond E. Davis, C.E., D.Eng., *Professor of Civil Engineering, Director of Engineering Materials Laboratory, Emeritus*.
- Charles Derleth, Jr., C.E., LL.D., *Professor of Civil Engineering, Emeritus*.
- Bernard A. Etcheverry, B.S., *Professor of Irrigation and Drainage, Emeritus*.
- Sidney T. Harding, B.S., *Professor of Irrigation, Emeritus*.
- Charles G. Hyde, B.S., LL.D., *Professor of Sanitary Engineering, Emeritus*.
- Boris Bresler, M.S., *Associate Professor of Civil Engineering*.
- * Tung Yen Lin, M.S., *Associate Professor of Civil Engineering*.
- Bernard D. Tebbens, Sc.D., *Associate Professor of Industrial Hygiene Engineering*.
- Ray W. Clough, Jr., Sc.D., *Assistant Professor of Civil Engineering*.
- Frederick L. Hotes, M.S., *Assistant Professor of Irrigation Engineering*.
- John Hugh Jones, M.S., *Assistant Professor of Civil Engineering*.
- Warren J. Kaufman, Sc.D., *Assistant Professor of Sanitary Engineering*.
- Francis H. Moffitt, M.C.E., *Assistant Professor of Civil Engineering*.
- Gerald T. Orlob, M.S., *Assistant Professor of Sanitary Engineering*.
- Erman A. Pearson, Sc.D., *Assistant Professor of Sanitary Engineering*.
- David Pirtz, M.S., *Assistant Professor of Civil Engineering*.
- Karl S. Pister, Ph.D., *Assistant Professor of Civil Engineering*.
- Milos Polivka, M.S., *Assistant Professor of Civil Engineering*.
- Charles F. Scheffey, M.S., *Assistant Professor of Civil Engineering*.
- Alexander C. Scordelis, M.S., *Assistant Professor of Civil Engineering*.
- Harry B. Seed, Ph.D., *Assistant Professor of Civil Engineering*.
- Cameron M. Smith, D.C.E., *Assistant Professor of Civil Engineering*.
- Bernard A. Vallerga, M.S., *Assistant Professor of Civil Engineering*.
- Carl L. Monismith, B.S., *Instructor in Civil Engineering*.
- Frank B. Clendenen, M.E., *Associate in Civil Engineering*.
- Edward Q. Moulton, M.S., *Associate in Civil Engineering*.
- David K. Todd, M.S., *Associate in Civil Engineering*.



Alexander Klein, M.S., *Lecturer in Civil Engineering*.

ELECTRICAL ENGINEERING

(Division Office, 131 Cory Hall)

- Leonard J. Black, Ph.D., *Professor of Electrical Engineering*.
- Charles F. Dalziel, E.E., *Professor of Electrical Engineering*.
- Thomas C. McFarland, M.S., *Professor of Electrical Engineering*.
- Paul L. Morton, Ph.D., *Professor of Electrical Engineering (Chairman of the Division)*.
- Lester E. Reukema, Ph.D., *Professor of Electrical Engineering*.
- Burtis L. Robertson, Ph.D., *Professor of Electrical Engineering*.
- * Samuel Silver, Ph.D., *Professor of Engineering Science*.
- John R. Whinnery, Ph.D., *Professor of Electrical Engineering (Vice-Chairman of the Division)*.

* Absent on leave, 1953-1954.

* In residence spring semester only, 1953-1954.

Dan M. Finch, B.S., *Associate Professor of Electrical Engineering.*
 Joseph T. Gier, M.S., *Associate Professor of Electrical Engineering.*
 Troy D. Graybeal, D.Eng., *Associate Professor of Electrical Engineering.*
 Robert M. Saunders, M.S., *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. Woodyard, Ph.D., *Associate Professor of Electrical Engineering.*
 Diogenes Angelakos, Ph.D., *Assistant Professor of Electrical Engineering.*
 Karl Hinrichs, M.S., *Acting Assistant Professor of Electrical Engineering.*
 Ralph S. Mackay, Ph.D., *Assistant Professor of Electrical Engineering.*
 George L. Matthaei, Ph.D., *Assistant Professor of Electrical Engineering.*
 Torben H. Meising, Ph.D., *Assistant Professor of Electrical Engineering.*
 Wilson S. Pritchett, M.S., *Assistant Professor of Electrical Engineering.*
 Malcolm R. Currie, M.S., *Instructor in Electrical Engineering.*
 Albert S. Hoagland, M.S., *Acting Instructor in Electrical Engineering.*
 Aldo J. Test, B.S., LL.B., *Acting Instructor in Electrical Engineering.*



Herbert R. Johnston, M.S., *Lecturer in Electrical Engineering.*
 George K. Tajima, M.S., *Lecturer in Electrical Engineering.*

ENGINEERING DESIGN

(Division Office, 124 Building T-7)

Clyne F. Garland, M.S., *Professor of Engineering Design (Chairman of the Division).*
 Alexander S. Levens, M.S., C.E., *Professor of Engineering Design.*
 Walter W. Soroka, Sc.D., *Professor of Engineering Design.*
 James L. Meriam, Ph.D., *Associate Professor of Engineering Mechanics.*
 Carl W. Nelson, Ph.D., *Associate Professor of Engineering Design.*
 Clinton J. Ancker, Jr., M.S., M.E., *Assistant Professor of Engineering Design.*
 Cyril P. Atkinson, M.S., *Assistant Professor of Engineering Design.*
 Kenneth E. Barnhart, Jr., M.S., *Acting Assistant Professor of Engineering Design.*
 Francis R. Berry, Jr., M.S., M.E., *Assistant Professor of Engineering Design.*
 Donald M. Cunningham, M.S., *Assistant Professor of Engineering Design.*
 Joseph Frisch, M.S., *Assistant Professor of Engineering Design.*
² Werner Goldsmith, Ph.D., *Assistant Professor of Engineering Design.*
 Albert L. Hale, M.S., *Acting Assistant Professor of Engineering Design.*
 Charles W. Radeliffe, M.S., *Acting Assistant Professor of Engineering Design.*
 William S. Rouverol, M.S., *Assistant Professor of Engineering Design.*



George E. Davis, M.A., *Lecturer in Engineering Design.*
 Winfield W. Sisson, B.S., *Lecturer in Engineering Design.*

² In residence spring semester only, 1953-1954.

MECHANICAL ENGINEERING

(Division Office, 115 Engineering Building)

E. Paul DeGarmo, M.S., *Professor of Mechanical Engineering.*Everett D. Howe, M.S., *Professor of Engineering (Chairman of the Division of Mechanical Engineering).*² Hans Albert Einstein, D.S.T., *Professor of Hydraulic Engineering.*Francis W. Hutchinson, M.S., M.E., *Professor of Mechanical Engineering.*Harold A. Johnson, M.S., *Professor of Mechanical Engineering (Vice-Chairman of the Division).*Joe W. Johnson, M.S., *Professor of Hydraulic Engineering.*Henry A. Schade, Dr. Ing., *Professor of Naval Architecture and Director of Engineering Research.*Leonid Michael Tichvinsky, D.E.M., *Professor of Mechanical Engineering.*Carl J. Vogt, M.S., *Professor of Mechanical Engineering.*Baldwin M. Woods, Ph.D., *Professor of Mechanical Engineering.*Israel I. Cornet, Ph.D., *Associate Professor of Mechanical Engineering.*^{*}Louis E. Davis, M.S., *Associate Professor of Mechanical Engineering.*Robert M. Drake, Jr., Ph.D., *Associate Professor of Mechanical Engineering.*Robert V. Dunkle, M.S., *Associate Professor of Mechanical Engineering.*Leonard Farbar, M.S., *Associate Professor of Mechanical Engineering.*Raymond C. Grassi, M.S., *Associate Professor of Mechanical Engineering.*Harold W. Iversen, 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., *Associate Professor of Mechanical Engineering.*Erich G. Thomsen, Ph.D., *Associate Professor of Mechanical Engineering.*James S. Campbell, Jr., M.M.E., *Assistant Professor of Mechanical Engineering.*Richard A. Fayram, M.S., *Assistant Professor of Mechanical Engineering.*Rostislav A. Galuzevski, M.S., *Assistant Professor of Mechanical Engineering.*Warren H. Giedt, Ph.D., *Assistant Professor of Mechanical Engineering.*Lawrence M. Grossman, Ph.D., *Assistant Professor of Mechanical Engineering.*Alan D. K. Laird, Ph.D., *Assistant Professor of Mechanical Engineering.*James T. Lapsley, Jr., M.S., *Assistant Professor of Mechanical Engineering.*Bruce G. McCauley, M.B.A., 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 S. Starkman, M.S., *Assistant Professor of Mechanical Engineering.*Lawrence Talbot, Ph.D., *Assistant Professor of Mechanical Engineering.*♣Virgil E. Schrock, M.E., *Instructor in Mechanical Engineering.*David C. Ipsen, Ph.D., *Lecturer in Mechanical Engineering.*

* Absent on leave, 1953-1954.

♣ On military leave, 1953-1954.

² In residence spring semester only, 1953-1954.

Frank L. Maker, M.E., *Lecturer in Mechanical Engineering.*
 Roland W. Pinger, M.E., *Lecturer in Mechanical Engineering.*
 Herman Thal-Larsen, M.S., *Lecturer in Mechanical Engineering.*

MINERAL TECHNOLOGY

(Division Office, 114 Hearst Memorial Mining Building)

Anders J. Carlson, C.E., Ph.D., *Professor of Petroleum Engineering.*
 John E. Dorn, Ph.D., *Professor of Metallurgy.*
 Ralph R. Hultgren, Ph.D., *Professor of Metallurgy.*
 Earl R. Parker, Met.E., *Professor of Metallurgy (Chairman of the Division of Mineral Technology).*
 Joseph A. Pask, Ph.D., *Professor of Ceramics.*
 John A. Putnam, Ph.D., *Professor of Petroleum Engineering.*
 S. Frederick Ravitz, Ph.D., *Professor of Metallurgy.*
 Lysle E. Shaffer, E.M., *Professor of Mining (Vice-Chairman of the Division of Mineral Technology).*
 Lester C. Uren, B.S., *Professor of Petroleum Engineering.*
 * Edward H. Wisser, B.S., *Professor of Mineral Exploration.*
 * David W. Mitchell, Ph.D., *Associate Professor of Metallurgy.*
 Bernard York, E.M., *Associate Professor of Mining.*
 Wilbur H. Somerton, Pet.E., *Assistant Professor of Petroleum Engineering.*
 Jack Washburn, M.S., *Instructor in Metallurgy.*



Granville S. Borden, B.S., *Lecturer in Mineral Technology.*
 William E. Colby, LL.B., *Lecturer in Mineral Technology.*
 Kenneth K. Kelley, Ph.D., *Lecturer in Metallurgy.*
 Frank G. Miller, Ph.D., *Lecturer in Mineral Technology.*
 George J. Young, B.S., *Lecturer in Mineral Technology.*

TRANSPORTATION ENGINEERING

(Division Office, 100 Building T-11)

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., Sci.D., *Professor of Civil Engineering.*



Fred N. Finn, M.S., *Lecturer in Transportation Engineering.*
 Robert Horonjeff, B.S., *Lecturer in Transportation Engineering.*
 W. Norman Kennedy, B.S., *Lecturer in Transportation Engineering.*
 Wayne H. Snowden, B.S., *Lecturer in Transportation Engineering.*
 Parker D. Trask, Ph.D., *Lecturer in Geological Engineering.*
 Cecil J. Van Til, M.S.C.E., *Lecturer in Transportation Engineering.*

* Absent on leave, 1953-1954.

² In residence spring semester only, 1953-1954.

Inspection trips may be a part of the academic program of any course given by the divisions of the Department of Engineering.

Lower division courses in the Department of Engineering which are of general interest to students in various curricula are listed under Engineering.

In addition to the prerequisites noted, Engineering students must complete the Engineering Examination, Lower Division.

ENGINEERING

LOWER DIVISION COURSES

- 1A-1B. Plane Surveying. (3-3) Yr. Beginning each semester.
 The Staff (Mr. Moffitt in charge)
 Prerequisite: trigonometry and one high school unit in mechanical drawing.
 Principles; field practice; calculations and mapping.
- 2A-2B. Supplementary Course in Plane Surveying: Field Work. (1-1) Yr. Beginning each semester.
 The Staff (Mr. Moffitt in charge)
 Open only to students entering the college at Berkeley with 2 units of credit for recitations and lectures in courses 1A-1B.
8. Materials of Engineering Construction. (2) I and II.
 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. The Staff (Mr. Moffitt in charge)
 Lectures and field work.
 Prerequisite: trigonometry and one high school unit in mechanical drawing. Prescribed for students in architecture and landscape architecture; not open to students in engineering.
 Principles; field practice; calculations and mapping.
22. Engineering Graphics. (2) I and II. 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 (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. Rouverol in charge)
Prerequisite: Physics 4A, Mathematics 4A and 4B (Mathematics 4B may be taken concurrently). Course 23 strongly recommended.
Force systems and equilibrium conditions with emphasis on engineering problems covering structures, machines, distributed forces, and friction. Includes graphical and algebraic solutions and an introduction to the method of virtual work.
40. Elementary Metallurgy. (3) I and II. Mr. Dorn
Two lectures and one laboratory period per week.
Prerequisite: Chemistry 1A, Physics 4A and 4B or 4C (may be taken concurrently).
An elementary course for students in agricultural, industrial, mechanical, and process engineering describing the relationships between microstructure, composition, heat and mechanical treatment, and physical properties of metals and alloys. Heat treatment of steel and nonferrous metals, production of steel, aluminum, and magnesium. Description of many engineering alloys.
Not open to metallurgy majors. Students specializing in metallurgy should take Chemistry 1B and Metallurgy 150A.
- 40K. Elementary Metallurgy. (2) I and II. Mr. Dorn
Prerequisite: same as for course 40.
- 40L. Elementary Metallurgy Laboratory. (1) I and II.
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. Grassi in charge)
Two lectures, one three-hour 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 three-hour demonstration period, and one three-hour laboratory period per 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 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, Mr. Rouverol
Prerequisite: freshman standing in an engineering program of study.

The fields of engineering; the great engineers and their achievements; the profession and its trends. The engineering student in a university; the engineer in his profession and as a member of society.

UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of the lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

100. Materials and Methods Used in Manufacturing. (3) I and II.

Mr. Lapsley, Mr. Grassi

Prerequisite: junior standing in Business Administration. Not open to students in engineering.

Study of the common materials (metals and non-metals), processes and equipment used in modern manufacturing.

113. Introduction to the Professional Aspects of Engineering. (2) I and II.

The Staff (Mr. Wiley 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, or Physics 112, or Chemistry 110B; Electrical Engineering 100A, 101, or 110A, or Physics 110A; Civil Engineering 108A.

Derivation of formulas used in the theory of investment; economy studies applied to original and alternative investments in engineering enterprise; replacement problems; relation of personnel and quality control factors to engineering economy; economy studies of governmental projects.

197. Summer Course in Hydroelectric Inspections. (4)

Mr. Dalziel

Prerequisite: senior or graduate standing in engineering; enrollment subject to consent of instructor.

Three-week inspection trip to selected hydroelectric projects in California. At the conclusion of the trip, the remainder of the Summer Session will be spent in the preparation of a written report. Inspections will include various types of dams, canals, conduits, penstocks, valves, hydraulic turbines, electric generators, transformers, switchgear, protective devices, and high-voltage transmission apparatus.



Courses characteristic of the various curricula offered by the College of Engineering are described under the several divisions of the department, as follows:

CIVIL ENGINEERING AND IRRIGATION

Civil Engineering

UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of the lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

101. Elementary Photogrammetry (3) I. Mr. Moffitt
 Prerequisite: Engineering 1A-1B.
 Geometry of single vertical photograph; stereoscopy and parallax measurement; principles of radial line plot; mosaics; oblique photographs. Laboratory includes flight planning, stereoscopic studies, topographic compilation by stereo-plotting, radial line plot, tilt determination, and orientation in multiplex.
- 102A. Route Surveying. (3) I and II. Mr. Moffitt
 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. Jones
 Prerequisite: course 102A.
 Influence of location upon earning power, with particular reference to effect of changes in distance, grade, and curvature upon operating expenses; plotting of maps, profiles, and mass diagrams; drafting of railroad structures.
- 103A. Supplementary Course in Route Surveying: Field Work. (1) I and II. The Staff (Mr. Moffitt in charge)
 Open only to students entering the college at Berkeley with 2 units of credit for recitations and lectures in course 102A.
104. Railroad Engineering. (2) I. Mr. Jones
 Prerequisite: course 102B.
 Grading, tunnels, signaling, track, yards, maintenance, line and grade changes.
- †105. Higher Surveying and Geodesy. (2) II. Mr. Moffitt
 Prerequisite: Engineering 1A-1B.
 Methods of geodetic surveying; adjustment of observation; geodetic positions; map projections.
106. Highway Engineering. (2) I and II. Mr. 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.
- 107A. Framed Structures. (3) I and II. Mr. Eberhart, Mr. Pirtz
 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. Scordelis, 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, Mr. Scordelis
 Prerequisite: senior standing and courses 112 and 107E, the latter may be taken concurrently.
 For architectural students. Stress computations and design of structures in wood, steel, and reinforced concrete, particularly of buildings.

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

- 107G. Analysis of Airplane Structures. (3) I and II.
 Mr. Eberhart, Mr. Bresler
 Prerequisite: course 107A or Engineering Design 106.
 Solution of typical stress analysis problems; load requirements; thin web beams; monocoque construction; plate stringer combinations; beam columns; space frames.
- 108A. Strength of Materials. (3) I and II.
 Prerequisite: Engineering 35. The Staff (Mr. Popov in charge)
 Elastic and ultimate resistance of materials; stress analysis for bars, beams, columns, and shafts; deflections and combined stresses; elements of design for wood and steel structures.
- 108C. Civil Engineering Laboratory. (1) I and II.
 The Staff (Mr. Kelly in charge I; Mr. Troxell in charge II)
 Prerequisite: Engineering 8 and course 108A, the latter 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 and II.
 The Staff (Mr. Polivka in charge I; Mr. Troxell in charge II)
 Prerequisite: Engineering 8 and course 108A, the latter may be taken concurrently.
 Physical tests of cement, aggregates, and concrete; proportioning and properties of concrete mixtures.
- 108F. Materials Testing Laboratory. (1) I and II.
 The Staff (Mr. Kelly in charge)
 Prerequisite: for engineering students, course 108A (may be taken concurrently); for architecture students, Engineering 18B.
 For students in agricultural, electrical, industrial 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. Vallerga 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, Mr. Kaufman, Mr. Orlob
 Prerequisite: Mechanical Engineering 103.
 Flow in sewers; fundamental considerations; design and construction of sewerage works.
- 109B. Design of Water Purification and Sewage Disposal Facilities. (2) II.
 Prerequisite: course 111B. Mr. Gotaas, Mr. Kaufman
 Engineering design of water purification and sewage treatment facilities; includes aeration, coagulation, sedimentation, decomposition, filtration, biology, oxidation and disinfecting processes.

- 111A. Water Supply Engineering. (2) I and II.
Mr. Pearson (in charge), Mr. Gotaas, Mr. Kaufman, Mr. Orlob
Prerequisite: Mechanical Engineering 103.
Water supply demands, yields of water sources; design and construction of water works.
- 111B. Chemistry and Biology of Water Purification and Sewage Treatment. (2) I. Mr. Langelier
Prerequisite: course 123.
The chemical and biological character of water and sewage; theory of water purification and sewage disposal processes.
112. Elements of Framed Structures. (2) I and II. Mr. Smith, Mr. Pirtz
Prerequisite: Engineering 18A-18B.
For students in architecture.
Analytical and graphical stress analysis for framed structures.
113. Foundations. (2) I and II. 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. Keim (in charge), 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
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.
Prerequisite: courses 123 and 125.
The science and practice of environmental sanitation in municipal, county, and state departments.
133. Elementary Structural Design. (3) I and II. Mr. Bresler, Mr. Smith
Prerequisite: course 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. Polivka
 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.
 Prerequisite: courses 107A, 133, and 135. Mr. Eberhart
 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. D. S. Berry
 Prerequisite: enrollment in a course in City and Regional Planning, or upper division or graduate standing in other fields (except Civil Engineering), and consent of 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.
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. Einstein
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 and course 106 (may be taken concurrently).
Street and highway traffic problems; principles of design of thoroughfares on the basis of operational characteristics; traffic regulation and control.
175. Airphoto Analysis and Interpretation. (3) II. Mr. Van Til
Prerequisite: senior standing in engineering or geology.
Principles of aerial photography and photogrammetry; the use of airphotos in identifying land forms, in locating transportation facilities, and in the interpretation of soil and drainage conditions for highway and airport site selection.
181. Engineering Construction. (3) I and II. Mr. Keim
Prerequisite: senior standing in engineering.
A study of the construction industry: its development, components, economic importance; fundamental principles that underlie construction practices, methods and equipment, their application and limitations; economic factors involved in planning, organizing, and operating a construction force.
190. Engineering Reports. (2) II. Mr. Kelly
Prerequisite: junior standing in civil engineering.
Application of written and oral expression to the preparation of technical reports and articles.
198. Directed Group Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Simpson 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. Simpson in charge)
Prerequisite: senior standing in engineering with scholarship average of B or higher.
Individual study and/or investigation of a subject in civil engineering in which the student has a special interest.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

208. Advanced Soil Mechanics. (3) II. Mr. Seed
Prerequisite: courses 108H, 113, and Mechanical Engineering 103.
Lectures, reading assignments, laboratory problems, and reports on advanced topics in soil mechanics.
220. Advanced Structural Analysis and Design. (3) I. Mr. Jameyson (in charge), Mr. Seordelis
Prerequisite: courses 136 and 137.
Lectures and computations in the analysis of statically indeterminate structures by moment distribution, column analogy, and other methods; design of building frames for wind and earthquake loadings.

221. Experimental Structural and Stress Analysis. (3) I. Mr. Clough
 Prerequisite: courses 136 and 137.
 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.
231. Dynamics of Structures. (3) II. Mr. Clough
 Prerequisite: Engineering Design 102B, courses 136, 137.
 Analysis of stresses and deflections in structures due to the application of dynamic loads. Approximate and "exact" methods for determining the response of buildings, bridges, frames, etc., to earthquake accelerations, wind gusts, moving loads, bomb blasts, etc.
235. Analysis and Design of Masonry Dams. (3) II. Mr. Hotes
 Prerequisite: graduate standing in civil engineering, courses 111A and 135.
 Lecture and design course. Selection of location and type; stability analysis, stress analysis of gravity, arch, multiple-arch, dome, and slab-buttress dams; problems imposed by construction conditions and use of mass concrete.
236. Advanced Bridge Design. (3) I. Mr. Scheffey
 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

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

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. J. W. Johnson
 Prerequisite: Mechanical Engineering 103, and graduate standing.
 The theory underlying the design of hydraulic structures, with particular reference to variable flow, channel waves, tides, transportation of detritus by stream, beach erosion, and the use of hydraulic models.
280. Concrete Construction Practice. (2) I. Mr. Kelly
 Prerequisite: courses 108E, 135, and graduate standing.
 Lectures and seminars. Consideration of broad aspects of concrete construction; technical requirements; selection of materials; control of quality; practices in the construction of dams, highways, airfields, canals, bridges, buildings, hydraulic structures.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
The Staff (Mr. Eberhart in charge)
 Prerequisite: graduate standing.
 Group study of selected topics: dynamic behavior of structures, earthquake design, analysis and design of buildings, properties of soils, foundation engineering, microscopy of water and sewage, refuse collection and disposal, advanced sanitary engineering design, and advanced topics in hydraulic engineering.
- 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.

Graduate Seminars. (No credit) I and II.

The Staff (Mr. Eberhart in charge)

Meetings of the staff and graduate students for discussion of current developments and research in various fields of Civil Engineering and Irrigation. Seminars scheduled in each of the following groups: Sanitary, Irrigation and Water Resources, and Structures (including Materials and Soil Mechanics).

Irrigation

Courses 101, 102A, 102B, 103, 104, 107, and 112 are designed to meet the needs of engineering students. Courses 106, 113 are designed for students in the College of Agriculture. Courses 103, 104, 106, and 113 are also open to students in other colleges.

UPPER DIVISION COURSES

The basic prerequisite for all upper division courses is satisfaction of lower division requirements in an engineering program of study and completion of the Engineering Examination, Upper Division. Additional prerequisites are indicated.

101. Irrigation Institutions and Economics. (2) II. Mr. Simpson
Prerequisite: course 103 or 113.
Water rights, irrigation institutions and organizations.
- 102A. Irrigation Engineering. (2) I and II. Mr. Simpson (in charge)
Prerequisite: Mechanical Engineering 103.
Investigation and general planning of irrigation systems; conveyance of water; silt problems; design of canals, tunnels, flumes, pipelines, inverted siphons.
- 102B. Irrigation Engineering. (2) I. Mr. Hotes
Prerequisite: 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 (in charge)
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 and II. Mr. Hotes
Prerequisite: junior standing and course 103 or 113.
Structure of soils and soil water and their relation to drainage; theory and principles of drainage; planning drainage systems; protection of lands against flood and tidewaters; organization of drainage and levee districts; methods of apportionment of assessments.
- *106. Irrigation Development and Organization. (2) II. _____
Prerequisite: Economics 1A-1B. For students in colleges other than Engineering.
Principles and administration of rights to use of water; organizations for and financing of irrigation developments.
During 1953-1954 students may take course 101 as a substitute for course 106.

* Not to be given, 1953-1954.

- *107. Operation and Maintenance of Irrigation Systems. (2) I. _____
Prerequisite: course 113 for agriculture students; courses 102A and 103 for engineering students.
112. Irrigation Design. (2) I and II. Mr. Hotes
Prerequisite: Civil Engineering 135 and Mechanical Engineering 103.
Design of structures such as flumes, drops, inverted siphons, and head-gates with estimates of cost.
- *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 1953-1954 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. Hotes 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. Hotes in charge)
Prerequisite: senior standing in engineering with scholarship average of B or higher.
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 10)

202. Advanced Irrigation Design. (2) I and II.
Prerequisite: course 112. Mr. Simpson (in charge), Mr. Hotes
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.

* Not to be given, 1953-1954.

- 100A-100B. Electrical Circuits and Machinery. (3-3) Yr. Beginning each semester. Mr. Robertson (in charge), Mr. Hoagland, Mr. Black
Prerequisite: Mathematics 14A or 4A-4B, Physics 4B.
Required for students in agricultural, industrial, and mechanical engineering.
- 100A. Voltage generation; circuit constants; single-phase and polyphase circuit analysis; single-phase transformers; polyphase connections of transformers.
- 100B. Machine windings and induced voltages; synchronous, induction, direct current, and single-phase machines; rectification; electronic tubes and their associated circuits; practical engineering problems.
101. Electrical Engineering. (3) I and II. Mr. H. R. Johnston, Mr. Test
Open to engineering students not registered in agricultural, electrical, industrial, or mechanical engineering.
Prerequisite: Mathematics 4A, Physics 4B.
Electric power generation, transmission, distribution, and utilization.
- †102. Electrical Engineering Laboratory. (1) I and II. Mr. Test
One three-hour period per week to be arranged. Sections limited to fifteen students.
Prerequisite: course 101, which should be taken concurrently if possible.
Experiments designed to illustrate electrical theory and afford practice in the operation of electrical equipment. Designed to accompany and supplement course 101.
- 103A-103B. Nuclear Accelerators. (2-2) Yr. Mr. Woodyard
Prerequisite: course 106 or 100B or Physics 110B or 121. (Prerequisite course may be taken concurrently with course 103A).
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: courses 100A-100B or 110A-110B (may be taken concurrently).
Introductory experiments illustrating principles of design and operation of alternating and direct-current motors and generators, transformers, vacuum tubes, single and polyphase circuits, metering and control equipment.
105. Electrical Measurements in Engineering. (3) I and II.
The Staff (Mr. Pritchett in charge)
Two lectures and one three-hour laboratory period per week.
Prerequisite (may be taken concurrently): course 100A, or 101, or 110A, Mathematics 110A.
Electrical measurements using direct current and low-frequency alternating current. Principles and characteristics of indicating and recording instruments, including oscillographs; potentiometer, bridge, and comparison methods; applications of these in the measurement of temperature, pressure, strain, etc., in various fields of engineering.

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

106. Basic Electronics. (4) I and II. The Staff (Mr. Tajima 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. Electric and Magnetic Circuits. (3-3) Yr. Beginning each semester. Mr. Pritchett, Mr. McFarland, Mr. Woodyard
 Prerequisite: Mathematics 14A or 4A-4B, Physics 4B.
 Required for students in electrical engineering.
 110A. Single-phase alternating current circuits.
 110B. Polyphase circuits, magnetic circuits, transformer theory.
- 111A-111B. Electrical Machinery. (3-3) Yr. The Staff (Mr. McFarland in charge)
 Prerequisite: courses 104A-104B, 106 (for 111B only), and 110A-110B. Recommended: Engineering Design 102B.
 111A. Polyphase and single-phase induction machines, synchronous machines, direct-current machines.
 111B. Synchronous machines, polyphase conversion apparatus, application problems.
- 116A-116B. Engineering Electronics and Radio Engineering. (3-3) Yr. Mr. Scott
 Prerequisite: courses 106 and 110B.
 Design and operating characteristics of radio transmitters and receivers for amplitude modulation, frequency modulation, television and radar; propagation of electromagnetic waves and the design of antennas and antenna arrays.
- 117A-117B. Electromagnetic Fields and Waves. (3-3) Yr. Mr. Angelakos (in charge), Mr. Reukema
 Prerequisite: course 106.
 The mathematics of vector fields, static electric and magnetic fields. Maxwell's equations. Applications to problems in wave propagation, skin effect, wave guides and cavity resonators, electromagnetic radiation, and ultra-high-frequency techniques.
- 118A-118B. Power System Protection. (2-2) Yr. Mr. Dalziel
 Prerequisite: course 111A (may be taken concurrently).
 Symmetrical components, analysis of short circuits, decrement curves, power system protection, instrument transformers, and metering errors.
121. Transient Phenomena. (3) II. Mr. Robertson
 Prerequisite: courses 100B or 110B, 104B, Engineering Design 102B.
 Physical and mathematical analysis of transient phenomena, primarily in electrical circuits; single, mesh, and coupled circuits; circuit response to varying voltage; general rules and theorems on circuits; equivalent systems; practical applications.
- 122A-122B. Electric Power Transmission and Distribution. (3-3) Yr. Mr. Dalziel
 Prerequisite: courses 110A-110B and Mathematics 110.
 Physical concepts of inductance, a-c resistance, capacitance. Development of mathematical expressions for distribution and transmission line parameters. Distribution system studies. Steady-state analysis of long lines. Determination of normal operating characteristics of power systems. Traveling waves, corona, mechanical design.

123A-123B. Telephone Engineering. (3-3) Yr.

Mr. Reukema

Prerequisite: courses 106 and 110B.

Telephone, telegraph, radio, and television transmission over open-wire, cable, and coaxial lines; design of transmitters and receivers, electrical filters, equalizers, phase distortion correctors, delay circuits, impedance matching circuits, and other electrical networks, and their coordination in communication circuits.

126. Industrial Electronics. (4) I and II.

Mr. Sloan

Prerequisite: courses 106 and 110B.

Basic principles of electronic devices and circuits commonly found in industrial applications, including: cold-cathode tubes; thyatron circuits; special power supplies and amplifiers; electronic heating; multivibrator type circuits; interval timers; testing, measurement, and control methods; current electronic developments.

127. Automatic Regulators. (4) II.

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 and 110A-110B (completed), and 116A (may be taken concurrently).

Experiments illustrating the fundamental principles involved in the operation of communication circuits and electronic devices. Particular consideration is given to the special methods of measurement, and special techniques, which must be employed at high frequencies.

132B. Electrical Communications Laboratory. (2) II.

The Staff (Mr. Black in charge)

Prerequisite: courses 116A, 132A and 117A or 123A (completed), 116B and 117B or 123B (to be taken concurrently).

Selected experiments illustrating the fundamentals of electronics and the generation, propagation, and radiation of electromagnetic energy. Particular consideration is given to the ultra-high-frequency and microwave regions.

133A. Electrical Machinery Laboratory. (2) I and II.

The Staff (Mr. 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) I.

Mr. Hinrichs

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: courses 106 and 110B.
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: courses 106 and 110B.
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.
- 151A-151B. Switching and Computing Circuits. (3-3) Yr. Mr. Meisling
Prerequisite: course 106.
The functional and electrical design of switching circuits. Techniques and circuit components for digital information. Applications in high-speed digital computers and in industrial control.
- 152A-152B. Digital Computers. (2-2) Yr. Mr. Morton
Prerequisite: Mathematics 110 or 119A-119B; 128 recommended.
Applications of digital computers to mathematical and statistical problems of engineering, business administration, and science. Characteristics of punched-card and electronic computers. Numerical analysis. Elementary programming.
- 153A-153B. Digital Computer Laboratory. (1-1) Yr. Mr. Morton
Prerequisite: to be taken concurrently with courses 152A-152B.
Experiments in the use of digital equipment.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Morton in charge)
Prerequisite: courses 106 and 110B, additional requirements may be specified by the instructor in each group.
Group study of selected topics in electrical engineering, usually related to new developments. For 1953-1954 studies are planned in transistor circuitry and miniaturization.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Morton in charge)
Prerequisite: courses 106 and 110B. Enrollment limited to senior students whose scholastic record shows at least a grade B average.
Individual study and/or research on a problem chosen by the student and carried out under guidance of an instructor. Enrollment is subject to additional requirements imposed by the instructor concerned.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

200A-200B. Research Literature. (2-1) Yr.

The Staff (Mr. Matthaei in charge)

200A will be offered in both the fall and spring semesters; 200B will be offered in the spring semester only.

Prerequisite: graduate standing. This course must precede or accompany graduate research in electrical engineering (course 299A or 299B should be taken concurrently).

Individual study of the historical background and present status of research in the field of special interest to each student, culminating in written and oral reports presented to the staff and students of electrical engineering.

206. Theory of High Frequency Tubes. (3) I.

Mr. Whinnery

Prerequisite: courses 116A-116B, 117A-117B, and graduate standing.

A study of the interchange of energy between electromagnetic fields and various electron streams operating under transit time conditions, with applications to the theory of space-charge controlled tubes, velocity modulation tubes, magnetrons, and traveling wave tubes.

210A-210B. Applied Electromagnetic Theory. (3-3) Yr.

Mr. Angelakos

Prerequisite: courses 117A-117B or Physics 110A-110B.

Advanced treatment of classical electromagnetic theory and its application to engineering problems. Electrostatics, magnetostatics, time varying fields. Interactions between electromagnetic fields and moving charges.

211A-211B. Electrical Machinery. (3-3) Yr.

Mr. Saunders

Prerequisite: courses 111B and 133B.

Generalized machine, machines with stationary and moving reference axes, interconnected machines, revolving magnetic fields, generation of emf, current flow in conductors, production of torque, leakage paths and fields; applications of these principles to the theory of existing machines.

216. Antenna Theory. (3) II.

Mr. Angelakos

Prerequisite: courses 117A-117B or equivalent.

Fundamental antenna concepts. Consideration of circuit properties and radiation patterns of linear and loop antennas. Coupled antennas, antenna arrays and reflector-type antennas. Measurement techniques and practices.

217. Microwave Networks. (3) II.

Mr. Whinnery

Prerequisite: courses 117A-117B, 123A-123B, and graduate standing.

A study of the application of network theory, including the general theorems, the methods of analysis, and the measurement techniques, to microwave guides, cavity resonators, and antennas.

218A-218B. Power System Stability. (2-2) Yr.

Mr. Dalziel

Prerequisite: for 218A, course 118A (may be taken concurrently); for 218B, courses 118A, 218A, and 118B (may be taken concurrently); 111A. Recommended: courses 111B, 122A-122B.

Reduction of power networks, steady-state and transient stability limits of power systems.

220A-220B. Electro-Acoustics. (2-2) Yr.

Mr. Black

Prerequisite: Recommended: courses 123A-123B or 117A-117B.

Analysis of vibrating systems; principles and apparatus involved in the production, propagation, measurement, and reception of sound.

222. Operational Circuit Analysis. (2) I. Mr. Robertson
 Prerequisite: course 121.
 Application of operational methods of circuit analysis, in particular the LaPlace Transformation, to systems having lumped or distributed constants.
- 223A-223B. Network Theory. (3-3) Yr. Mr. Matthaei
 Prerequisite: course 123B and Mathematics 185, the latter may be taken concurrently.
 223A. Network analysis utilizing determinants, matrices, the complex frequency plane, the electro-static potential analogy, Fourier and LaPlace transforms as tools. Mathematical properties of two-terminal network impedance functions. Canonical forms for L-C, R-C, and R-L networks.
 223B. General methods for synthesis of 2-terminal networks. Mathematical properties of 4-terminal networks. Realization of transfer functions in passive 4-terminal networks. Synthesis of filter and amplifier transfer functions to meet prescribed performance specifications.
- *225. Pulse Techniques Laboratory. (1) I. Mr. Mackay (in charge)
 Prerequisite: seminar on pulse techniques.
 Properties of multivibrators, delay lines, counters, differentiators, and blocking oscillators, and effects of variation of parameters thereon. Pulse generation, measurement. Proper use of fast oscilloscopes and other measuring devices.
- 226A-226B. Advanced Industrial Electronics. (3-3) Yr. Mr. O. J. M. Smith
 Prerequisite: course 126.
 Electronic instrumentation and control, heating, metallurgical testing, medical applications, geophysical apparatus, electrolytic processes and calculators.
- 227A-227B. Feedback Control Systems. (3-3) Yr. Mr. O. J. M. Smith
 Prerequisite: course 127 or equivalent, Mathematics 185, and course 222, which should be taken concurrently.
 Design criteria, maximization of information-to-noise ratio, design templates for power density spectra, attenuation-phase plane, and s plane. Nonlinear and discontinuous systems, including hysteresis, backlash, and stiction. Pole loci, stability, correlation functions, stabilization by curve prediction, human servo link.
- 251A-251B. Digital Computer Systems. (3-3) Yr. Mr. Meisling
 Prerequisite: courses 151A-151B, 152A (may be taken concurrently).
 Design of digital systems, including overall planning, combination of functional elements, design of electric circuitry, and planning of tests and check procedures. Analysis and synthesis of switching networks using adaptations of symbolic logic. Design examples, tests and demonstrations.
- 252A*-252B. Applications and Programming of Digital Computers. Mr. Morton
 (2-2) Yr.
 Prerequisite: courses 152A-152B.
 Study of types available, order codes, and checking procedures. Preparation and use of sub-routines libraries. Logical design of computers.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
 The Staff (Mr. Morton in charge)
 Prerequisite: specific preparation as imposed by instructor in each group.
 Advanced group study in electrical engineering; topics vary from

* Not to be given, 1953-1954.

year to year. Seminars will be arranged on research project subjects or new fields open to research; possible topics for 1953-1954 are solid-state electronic devices, information theory, and special machines.

299A-299B. Individual Study or Research. (1-5; 1-5) Yr. Beginning each semester. The Staff (Mr. Morton in charge)

Prerequisite: course 200A or 200B (should be taken concurrently).
Investigation of advanced electrical engineering problems.

PROFESSIONAL COURSE

400. The Electron Microscope. (1) I and II. Mr. Mackay

Prerequisite: Physics 2A-2B and 3A-3B, or 4A-4B-4C; Chemistry 1A and 8 or 1B; primarily for persons who expect to use an electron microscope in scientific research.

General limitations on all microscopes; different types of electron microscopes with their principles, limitations, and capabilities; magnification calibration; vacuum systems and gauges; photographic techniques; specimen preparation, including sectioning, replica production, and shadowing techniques; the practical attainment of high resolving power.

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. Rouverol in charge)

Prerequisite: Mathematics 4A-4B, Physics 4A, Engineering 35.

Kinematics and kinetics of a particle and of rigid bodies as applied to engineering problems. Force, energy, and momentum methods of solution. Introduction to mechanical vibrations.

102C. Advanced Mechanics. (3) II. Mr. Meriam

Prerequisite: course 102B. Mathematics 110A-110B 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. Ancker in charge)

Two lectures and two three-hour laboratory periods per week.

Prerequisite: Engineering 24, course 102B, and Civil Engineering 108A.

Application of the principles of mechanics, physical properties of materials, and shop processes to the design of machine parts. Empirical and rational methods are employed.

111. Graphical and Mechanical Computations. (3) I. Mr. Levens

Two lectures and one hour of supervised computation per week.

Prerequisite: senior standing in engineering, mathematics, or science.

Functional scales; theory and construction of nomographic charts for three or more variables; graphical integration and differentiation. Representation and analysis of experimental data.

170. Mechanics of Machinery. (3) I and II. Mr. Garland

Prerequisite: course 102B and Mathematics 110A-110B.

Analysis of motions and forces in mechanisms. Introduction to the theory of mechanical vibrations with applications to dynamic balancing, critical speeds, governed systems, and vibration isolation.

171. Design of Mechanical Equipment. (3) I. Mr. Nelson
Two lectures and one three-hour laboratory period per week.
Prerequisite: course 106.
Application of engineering principles to the design of complete machines. Analysis of curved beams, centrifugal stresses, thermal stresses, and other selected topics. Theoretical and empirical methods. Economic aspects in material selection and processing.
172. Stress Analysis of Machine Parts. (3) II. The Staff (Mr. Cunningham in charge)
Two lectures and one three-hour laboratory period per week.
Prerequisite: course 106, Mathematics 110A-110B, and senior standing in engineering.
Experimental and theoretical methods for the determination of stresses and deflections in typical machine members. Factors affecting failure and the choice of working stresses. Laboratory experiments making use of brittle lacquers, various types of strain gauges, photoelasticity and other methods.
173. Acoustics of Machinery. (3) II. Mr. Soroka in charge
Prerequisite: course 102B and Mathematics 110A-110B. Recommended: course 170.
Lectures and demonstrations in the measurement, analysis and correction of noise in machinery installations. Noise transmission through building structures. Sound-proofing. Acoustic filters. Ultrasonic applications.
180. Elements of Analog Computers. (3) I. Mr. Atkinson
Prerequisite: course 102B or equivalent; Electrical Engineering 100A, 110A, or 101; students majoring in mathematics, physics or chemistry with equivalent background may be admitted at the discretion of the instructor.
Introduction to analog computers, emphasizing basic elements used in their construction and operation. Representation of fundamental mathematical processes by mechanical, electro-mechanical, electrical and electronic devices. Integrators, differentiators, multipliers, adders, etc. Use of analog laboratory equipment.
198. Group Studies for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Garland in charge)
Prerequisite: senior standing in engineering, plus particular courses to be specified by the instructor for each group.
Studies in selected special subjects in the fields of engineering graphics, dynamics, elasticity, analog computing methods, engineering plastics, and design of mechanical equipment.
199. Individual Study or Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Garland in charge)
Prerequisite: senior standing in engineering with scholarship average of B or higher plus particular courses to be specified by the instructor in each instance.
Individual study or research on a special problem in graphics, dynamics, elasticity, or design of mechanical equipment. Enrollment is subject to consent of an instructor and to the availability of laboratory facilities.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

280. Application of Analogs to Engineering Problems. (3) II. Mr. Soroka
Prerequisite: graduate standing in engineering, physics, or mathematics.

Lectures and demonstrations in the simulation of physical systems by various analogies. Analogs of linear and nonlinear algebraic and differential equations. Membranes, conducting sheets, electrical networks, electronic and mechanical computing devices applied to engineering problems.

- 284A-284B. Advanced Dynamics of Machinery. (3-3) Yr. Mr. Soroka
Prerequisite: graduate standing. Recommended: course 170.
Theory of mechanical vibrations. Linear and nonlinear systems. Self-excited vibrations. Methods of Newton, Lagrange, Stodola, and Rayleigh-Ritz applied to complex lumped and distributed systems. Practical approximate methods of analysis.
- 285A. Basic Theory of Elasticity. (3) I. Mr. Nelson
Prerequisite: graduate standing, differential equations, and strength of materials.
Fundamental concepts and methods of the mathematical theory of elasticity with application to engineering problems.
- 285B. Advanced Theory of Elasticity. (3) II. Mr. Nelson
Prerequisite: course 285A.
A continuation of course 285A including the study of torsion, curvilinear coordinates, three-dimensional problems, flat plates, and other selected topics.
- *287A. Advanced Engineering Dynamics. (3) I. _____
Prerequisite: course 102B or Physics 105B, Mathematics 110A-110B or equivalent; graduate standing in engineering, mathematics or physics. Course 284A-284B recommended.
Applications of advanced dynamics to engineering problems. Dynamics of constrained systems using generalized coordinates. Lagrange's equations with applications to engineering systems. Resistance to motion. Vibrations about a steady state of motion. Stability of mechanical systems. Wave propagation in elastic and plastic materials.
- *287B. Impact. (3) II. _____
Prerequisite: course 287A. Course 284A-284B recommended.
Analysis of stress-strain histories and impact loading of beams and plates. A study of the collision of bodies. Applications. Discussion of recent literature.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
Prerequisite: graduate standing. The Staff (Mr. Garland in charge)
Seminars in specialized subjects such as dynamics, elasticity, stress analysis, design of pressure vessels, impact. Different subjects will be offered in successive semesters.
- 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.

* Not to be given, 1953-1954.

103. Elementary Fluid Mechanics. (3) I and II.
The Staff (Mr. Laird and Mr. J. W. Johnson in charge)
Prerequisite: Engineering Design 102B (may be taken concurrently).
The principles of mechanics applied to the statics and to the flow of incompressible and compressible fluids.
- 105A. Thermodynamics. (3) I and II. The Staff (Mr. Tichvinsky in charge)
Prerequisite: Chemistry 1B or 8; Physics 4C; Mathematics 4B; Engineering Design 102B (may be taken concurrently).
Energy transformations, reversibility, availability; thermal properties of gases and vapors. Theoretical cycles and practical engine forms, mechanisms and performance.
- 105B. Thermodynamics. (3) I and II. 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. Iversen in charge)
Prerequisite: courses 105A, 105B, 103. (Courses 105B and 103 may be taken concurrently). For electrical engineering students, courses 105A, 109 may be taken concurrently. For chemical engineering students, Chemical Engineering 144 and 146A, one of which may be taken concurrently.
Experimental work accompanied by calculations and reports on fluid flow, heat transfer, mechanics, combustion, internal combustion and other heat engines and power plants.
109. Introduction to Fluid Mechanics and Applied Thermodynamics.
(3) I and II. Mr. Ipsen
Prerequisite: course 105A. Not open to students taking course 103 or 105B.
For students in electrical engineering only.
The elements of mechanics applied to the statics and dynamics of incompressible and compressible fluids. The application of thermodynamics to heat transmission, vapor and gas mixtures, and power cycles.
115. Reversed Thermodynamic Cycles and Refrigeration. (3) I.
Mr. Hutchinson
Prerequisite: course 105B. Not open to students who have taken course 117.
Theory and practice of refrigeration, illustrated by study trips to actual plants.
116. Industrial Air Conditioning Methods Economics. (3) II.
Mr. Hutchinson
Prerequisite: course 105B. Not open to students who have taken course 117.
Theory and practice of air conditioning, illustrated by study trips to actual plants.
- *117. Combined Refrigeration and General Air Conditioning. (3) I.
Prerequisite: course 105B.
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.

* Not to be given, 1953-1954.

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. Oppenheim, Mr. Dunkle
 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
 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)
 Prerequisite: course 103 (may be taken concurrently), 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 mechanics, heat transfer, and dynamics.

132. Process Unit Operations Laboratory. (4) I. Mr. Farbar
Prerequisite: courses 103, 105A.
Laboratory investigations of process unit operations and performance of some process equipment.
143. Motion and Time Study. (3) I and II. Mr. McCauley (in charge)
Prerequisite: Engineering 41, 42, or 100; Business Administration 140 (may be taken concurrently), Mathematics 130E recommended.
Principles of motion economy; study of hand motions and their simplification through the use of process charts, micromotion analysis, and workplace design; equipment layout; theory and practice of time study, rating of worker performance, and standard data theory.
145. Tool Engineering. (3) I and II. Mr. Galuzevski
Two lectures and one three-hour laboratory period per week.
Prerequisite: course 143 (may be taken concurrently); Engineering 41, Engineering Design 106.
Admission will be determined by a qualifying examination on the subject matter of Engineering 24, 40, 41, and Engineering Design 106. This examination will be given during registration week.
The selection of tooling for production; design of tools, jigs, fixtures, dies and production type gauges; design and tooling of automatic machines.
146. Wage Incentives and Job Evaluation. (2) I and II. Mr. Keachie, Mr. McCauley
Prerequisite: course 143, Business Administration 140, Mathematics 130E recommended.
Development of wage incentive and job evaluation plans, classification, mathematical and graphical analysis, uses and limitations. The area wage survey, statistical analysis of wage structure. Merit rating and governmental regulations on wages and salaries.
147. Industrial Engineering. (3) II. Mr. Grassi
Two one-hour lectures and one three-hour work period per week.
Prerequisite: courses 145, 146, Engineering 120, Business Administration 100, 140. (Course 146, Engineering 120, and Business Administration 100 may be taken concurrently.)
Problems involved in the design and operation of production facilities; product analysis, plant location, plant services, equipment selection, plant design, production planning and scheduling, production control, personnel factors.
151. Industrial Heat Transfer. (3) I and II. Mr. Drake, Mr. Giedt
Prerequisite: courses 103, 105B. Recommended: Mathematics 110A-110B.
The study of the basic principles of heat transfer and their application to the design of industrial equipment. Steady-state and transient problems of conduction by analytical and graphical methods. Free and forced convection. Transfer of radiant energy.
152. Industrial Mass Transfer. (3) II. Mr. Stewart, Mr. Snyder
Prerequisite: courses 105B or 151, 103 or Chemical Engineering 146A.
Mass transfer processes both with and without simultaneous heat transfer applied to process equipment involving evaporation, evaporative cooling, humidification, dehumidification and gas absorption.

154. Thermodynamics. (3) I. Mr. Grossman
 Prerequisite: course 105B or Chemical Engineering 143 and course 103.
 Recommended: Mathematics 110A-110B.
 Engineering applications of the first and second laws of thermodynamics. Thermodynamics of the pure component and of mixtures and solutions in flow systems, separation processes, combustion reactions, and phase equilibria.
161. Applied Fluid Mechanics. (3) I and II. Mr. Iversen
 Prerequisite: course 103.
 The theory of viscous and turbulent flow with related phenomena; hydraulic machinery (including pumps, fans, compressors, turbines, and hydraulic couplings), similarity criteria and model laws.
162. Elementary Hydrodynamics. (3) I. Mr. Putnam, Mr. Laird
 Prerequisite: course 103 and Mathematics 110A-110B.
 Stream function, potential function, and conformal transformation with applications to engineering problems. Theory and application of viscous and compressible flows.
163. Flow Problems of the Process Industries. (3) II. Mr. Farbar
 Prerequisite: courses 103 and 105A. For chemical engineering students, Chemical Engineering 146A-146B.
 Flow properties of mixtures and suspensions, plastic flow, multiphase flow, materials handling, mixing and pumping equipment.
164. Instrumentation and Automatic Control. (2) I and II. Mr. Thal-Larsen, _____
 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, courses 103 and 105A or Chemical Engineering 146A.
 Principles of corrosion. The selection of equipment and its design specification for chemical and petroleum process industry. Consideration of process operating requirements, such as pressure, temperature, corrosion.
198. Directed Group Studies for Undergraduates. (1-5) I and II. The Staff (Mr. H. A. Johnson in charge)
 Prerequisite: upper division standing in Engineering.
 Group 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, mechanical engineering instruments laboratory, and special design problems.
199. Individual Study and Research for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Seban 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 10)

Graduate standing is required for admission to these courses. In addition, graduate students must have completed at least Mathematics 110A-110B before undertaking any of the following courses, except as noted.

230. Engineering Analysis. (3) I. Mr. Schaaf
Prerequisite: graduate standing in engineering or Mathematics 110A-110B.
Methods of theoretical analysis of typical engineering systems. Practice in setting up and solving engineering problems in heat transfer, fluid mechanics, electrical network, mechanical vibrations, and elasticity.
243. Advanced Motion and Time Study. (3) I. Mr. L. E. Davis
Prerequisite: courses 143, 146, Mathematics 130E (Mathematics 110A-110B not required).
This course is a continuation on an advanced level of the subject matter presented in course 143; presentation of complex problems of production measurements and methods development; introduction to research techniques in development of fundamental data.
245. Advanced Metal Cutting. (3) I. Mr. Galuzevski
Prerequisite: course 145 or equivalent. Mathematics 110A-110B not required.
Theoretical aspects of metal cutting. Chip formation; selection and use of cutting tools; machinability and tool life; heat transfer problems and selection of cutting fluids. Tooling of screw machines. Relation of dimensional control to interchangeable manufacturing.
265. Heat Conduction. (2) I. Mr. H. A. Johnson
Prerequisite: courses 151 and 230 (may be taken concurrently).
Study of steady-state, transient, and periodic problems of heat conduction using both mathematical and numerical methods of solutions. Introduction to problems of thermal stress.
266. Heat Convection. (3) II. Mr. Seban
Prerequisite: courses 151, 162, and 230.
Mathematical analysis of convection problems, including boundary layer theory and heat transfer during laminar and turbulent flow. Discussion of allied topics such as boiling, condensation, and mass transfer.
267. Thermal Radiation. (2) I. Mr. Dunkle
Prerequisite: course 151 (may be taken concurrently).
The transfer of radiant energy, gaseous radiation, geometrical and spectral characteristics of systems involving thermal radiation.
268. Advanced Problems in Thermodynamics. (3) II. Mr. Grossman
Prerequisite: course 154.
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. _____
Recommended: course 161 or 162.
The design and performance of all types of pumping machinery.

* Not to be given, 1953-1954.

272. Flow in Porous Media. (3) II. Mr. Putnam
 Recommended: course 162 or Mathematics 270.
 Applications of fluid mechanics and thermodynamics to flow of single-phase and multiphase fluids in porous media, with application to reservoir problems.
276. Mechanics of Real Fluids. (3) II. Mr. Laitone
 Prerequisite: course 230. Recommended: courses 161 and 162.
 Theory of viscous and turbulent flow with applications to fundamental flow problems.
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. H. A. Johnson in charge)
 Seminars may be organized in appropriate fields such as aerodynamics, rarefied gas dynamics, principles of combustion, industrial engineering, metal cutting, air conditioning, dynamics, pressure vessel design, thermodynamics, heat transfer, Diesel engines, furnace design, vacuum systems design, lubrication, gas turbines, automatic control and nuclear engineering. 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. Seban 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: enrollment limited to senior students in engineering, chemistry, geology, or physics with a scholarship average of B or higher.
Individual research studies pertaining to properties and utilization of non-metallic minerals and to the problems of the different divisions of the ceramic industry.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

271. Refractories. (2) I. Mr. Pask
Prerequisite: course 161 or consent of the instructor.
Types of refractories. Raw materials and technical problems of manufacture. Fundamental theories in regard to fusion or refractoriness, thermal shock resistance, spalling resistance, thermal conductivity, load bearing capacity at high temperatures. Consideration of applications of refractories based on these properties.
298. Group Studies, Seminars, or Group Research. (1-5) I and II. Mr. Pask
Prerequisite: graduate standing and consent of the instructor.
Principles of crystal chemistry and their application to ceramics. Formation, structure and physical properties of glasses. Advanced studies of high temperature reactions. Physical, thermal, and electrical properties of materials. Theory and practice of ceramic-to-metal bonding.
- 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

The basic prerequisite for all lower division courses is, in addition to the prerequisites noted, the completion of the Engineering Examination, Lower Division.

- 2A. Metallurgical Analysis. (3) I. Mr. Ravitz
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. Ravitz
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. Hultgren, 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. Ravitz
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. Ravitz
Prerequisite: course 108.
Laboratory experiments in the unit operations involved in mineral dressing; crushing, sampling, grinding, screening, classification, gravity concentration, flotation. Quantitative work on the separation and recovery of the valuable minerals from ores and on mineral dressing microscopy.
- *110B. Mineral Dressing Laboratory. (2) I. Mr. Mitchell
Prerequisite: course 110A.
Continuation of course 110A. Applications of mineral dressing unit operations and processes to the treatment of ores. Design of flow sheets.
- *111. Metallurgical Unit Operations Laboratory. (2) I. Mr. Ravitz
Lecture and laboratory.
Prerequisite: Chemical Engineering 146A or Mechanical Engineering 103.
Selected bench and pilot plant scale experiments on the unit operations employed in the beneficiation of mineral raw materials: sampling, crushing, grinding, classification, screening, thickening, filtration, gravity and magnetic concentration, flotation.
- *118. Extractive Metallurgy Laboratory. (2) II. Mr. Ravitz
Prerequisite: course 100B or consent of instructor.
Fundamental metallurgical measurements: pyrometry, calorimetry, gas analysis, gas flow, hydrogen ion concentration, etc. Experiments in roasting, smelting, refining, and electrolysis. Determination of weight and heat balance of a furnace.
- *120. Advanced Extractive Metallurgy. (3) I. Mr. Ravitz
Prerequisite: course 100B, Chemistry 110B or 109.
Advanced study of the production of iron and steel and the major non-ferrous metals; engineering, physical-chemical, and economic principles concerned.
- *140. Metallurgical Thermodynamics. (3) I. Mr. Ravitz
Prerequisite: Chemistry 110B and senior standing.
The principles of thermodynamics with emphasis on application to metallurgical problems.

* Not to be given, 1953-1954.

- 150A. Physical Metallurgy. (3) I. Mr. Parker
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.
152. Physical Metallurgy. (1 or 2) I. Mr. Parker
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. Parker
Prerequisite: open only to students who have had course 152 in a previous year.
The laboratory part of course 150A.
154. Advanced Metallography. (3) II. Mr. Washburn
Prerequisite: courses 150A, 150B.
Advanced laboratory work in metallography, including the synthesis, heat treatment, and metallographic study of alloys; theory and practice of photomicrography. Occasional lectures, conferences, and outside reading. The student is encouraged to pursue projects in the line of his particular interest.
160. X-ray Metallography. (3) I. Mr. Washburn
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. Washburn
Prerequisite: course 150A or Engineering 40.
Lectures and laboratory instruction on the industrial techniques for inspection of metals; the principles and application of visual inspection, macrography, magnetic, and fluoroscopic methods of testing; the theory of X-ray radiography and its application to metal inspection.

- *174. Metallic Reaction Rates. (3) II. Mr. Dorn
Prerequisite: course 150A (or Engineering 40 and course 152) and Chemistry 110A-110B. Recommended: Mathematics 110A-110B.
A study of the application of the principles of kinetics of metallurgical reactions, diffusion, and heat transfer to the problems of casting, heat treating, and welding of metals.
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.
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: enrollment limited to senior students in engineering with a scholarship average of B or higher.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- †202. Metallurgy of the Less Common Metals. (2) II. Mr. Ravitz
- †210A-210B. Metallurgical Investigation. (2 or 3; 2 or 3) Yr.
Program of work and credit to be arranged. Mr. Mitchell, Mr. Ravitz
Prerequisite: course 110B.
- †240. Metallurgical Thermodynamics. (3) II. Mr. Kelley
Prerequisite: course 140 or Chemistry 114H.
Thermodynamic properties of metallurgical substances and their application to heat balances and reaction equilibria in extractive metallurgical processes.
250. Physics of Metals. (3) I. Mr. Hultgren
A theoretical study of the metallic state emphasizing those properties of technologic importance; chemical bonding forces, crystal structures of metals and alloys, compressibility, specific heat, magnetism, electrical and thermal conductivity, thermodynamics.
256. Reaction Kinetics in Metals. (3) II. Mr. Dorn
Prerequisite: course 150A and Chemistry 110A-110B.
Introduction to the application of statistical mechanics to reaction kinetics in metallic systems. Special emphasis will be given to analytical treatment of recrystallization, phase transformations including decomposition of austenite and precipitation hardening, diffusion in metals, and the hardenability of steels.
260. Properties of Single Metal Crystals. (3) II. Mr. Washburn
Two lectures and one three-hour laboratory period per week.
Prerequisite: course 160 and graduate standing.
Preparation of metallic single crystals, stress strain relationships for crystals having different orientations, theories of strain hardening, internal

* Not to be given, 1953-1954.

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

friction, magnetic properties, preferred orientation in polycrystalline materials, orientation determination and pole figures, relation between properties of single crystal and polycrystalline materials.

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.

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. Mr. Shaffer
Prerequisite: Geology 1, Mineralogy 4B or 6, Mathematics 4A.
Raw materials, beneficiation of raw materials, marketing products; organization of the industry. Elements of mining, prospecting, sampling; breaking and supporting ground; haulage, drainage, ventilation; driving of development workings.
103. Mineral Exploitation. (3) I. Mr. Shaffer
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. Shaffer
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 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.
Prerequisite: course 103 (to be taken concurrently). Mr. Shaffer
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
111A and 111B to be given in the spring semester only, 1954. May be taken concurrently.
Prerequisite: course 101, Geology 102A-102B, 103, and 106, or senior standing in geology.
Methods of exploring for commercial mineral deposits: geologic mapping, sampling, exploratory drilling, geophysical methods. Assembly and analysis of data secured. Structural analysis of mineralized districts from the standpoint of the mechanics of rock deformation; application to the search for valuable minerals.
113. Mine Rescue and First Aid. (1) II. Evening classes (for opening dates see official bulletin board).
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: enrollment limited to senior students in engineering with a scholarship average of B or higher.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Investigations in Mining Practice. (2 or 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, 23, and course 121A (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: enrollment limited to senior students in engineering with a scholarship average of B or higher.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 207A. Fundamentals of Reservoir Engineering. (2) I. Mr. Putnam
Prerequisite: Mathematics 110 and Chemistry 109 or Mechanical Engineering 154.
Thermodynamic, volumetric, and phase behavior of reservoir fluids. Characteristics and properties of reservoir rocks. Fundamentals of multiphase fluid flow in porous media.
- 207B. Fundamentals of Reservoir Engineering. (2) II. Mr. Putnam
Prerequisite: Mathematics 110. Recommended: course 207A, Mechanical Engineering 162 or 272.
Advanced topics in oil and gas reservoir mechanics including material balance procedures, reservoir performance studies, cycling, water and gas drives, and gravity drainage.
- †209A. Seminar in Petroleum Processing. (2 or 3) I. Mr. Carlson
Prerequisite: course 119 and completion of program of study in process engineering or chemical engineering.
Modern petroleum refinery practice. Technology of petroleum processing. Plant operation.
- †209B. Seminar in Petroleum Processing. (2 or 3) II. Mr. Carlson
Prerequisite: course 209A or consent of instructor.
Evaluation of crude oils, raw stocks, and finished products. Study of factors which determine plan of processing in a petroleum refinery.
213. Valuation of Oil- and Gas-Producing Properties. (2) II. 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.

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

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 instructor.
 Engineering studies of traffic volumes, speeds, parking, and accidents, and analysis of data in applying traffic signs, signals, and markings, and other traffic regulations. Driver behavior and limitations. Characteristics of vehicle operations. For majors in police administration and public administration.
198. Directed Group Studies for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. 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: enrollment limited to senior students in engineering with a scholarship average of B or higher.
 Individual study or research of approved projects in transportation engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Highway Planning and Economics. (3) I. Mr. Moyer
 Prerequisite: graduate standing in engineering. Undergraduates in certain programs of study may be admitted.
 A comprehensive study of highway planning surveys, methods, and results; application of results of planning surveys in programming highway improvements; economic analysis of highway improvements; urban traffic studies and planning urban street improvements; parking and zoning studies; highway finance.
202. Advanced Highway Design. (3) II. Mr. Moyer
 Prerequisite: graduate standing in engineering. Undergraduates in certain programs of study may be admitted.
 An advanced study of the location and design of various types and classes of highways. Emphasis is placed on advanced theory and practice in the design of alignment; highway cross sections, intersections, interchanges, multi-lane expressways and arterial highways in urban areas.
210. Traffic Engineering. (3) I. Mr. D. S. Berry
 Prerequisite: graduate standing in engineering, except when special provision is made for students in certain programs of study.
 Analysis of basic characteristics of traffic movement, such as volumes, speeds, origins and destinations, delays, road capacity, and accidents. Techniques for making traffic engineering investigations.

- 210L. Traffic Engineering Laboratory. (1) I. Mr. 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. Parking control and public transit planning. Traffic engineering administration.
220. Highway and Airport Pavements. (3) I. Mr. Horonjeff
Prerequisite: graduate standing in engineering.
An advanced study of the theories, principles, and practices in the design, construction, and maintenance of highway and airport pavements, including soil stabilization, design of rigid and flexible pavements, accelerated traffic and loading tests, and the design of asphaltic mixtures.
270. Airport Engineering. (3) II. Mr. Horonjeff
Prerequisite: graduate standing.
Survey of the functions of government agencies in airport planning and the financing of public airports; evaluation of community airport requirements; factors covering the selection of airport sites; air traffic control and its effect on airport design; airport design requirements with respect to runways, taxiways, terminal area, drainage, and lighting.
298. Group Studies, Seminars, or Group Research. (1-5) I and II.
The Staff (Mr. H. E. Davis in charge)
Prerequisite: graduate standing.
Seminars or integrated group studies in selected advanced subjects in transportation engineering; such as highway policy, administration, finance, materials, public transit, air transport policy and administration.
- 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.

ENGLISH

(Department Office, 2125 Dwinelle Hall)

- * Myron F. Brightfield, Ph.D., *Professor of English.*
Arthur G. Brodeur, Ph.D., *Professor of English and Germanic Philology.*
Bertrand H. Bronson, Ph.D., *Professor of English.*
James R. Caldwell, Ph.D., *Professor of English.*
James M. Cline, Ph.D., *Professor of English.*
Willard H. Durham, Ph.D., *Professor of English.*
Willard E. Farnham, Ph.D., *Professor of English (Chairman of the Department).*
- ¹ James D. Hart, Ph.D., *Professor of English.*
Benjamin H. Lehman, Ph.D., *Professor of English.*
Josephine Miles, Ph.D., *Professor of English.*

* Absent on leave, 1953-1954.

¹ In residence fall semester only, 1953-1954.

- George R. Potter, Ph.D., *Professor of English.*
 Mark Schorer, Ph.D., *Professor of English.*
 Henry N. Smith, Ph.D., *Professor of English.*
 * George R. Stewart, Ph.D., *Professor of English.*
 Walter M. Hart, Ph.D., LL.D., *Professor of English, Emeritus.*
 Bertrand Evans, Ph.D., *Associate Professor of English and Education.*
 Arthur E. Hutson, Ph.D., *Associate Professor of English.*
 John E. Jordan, Ph.D., *Associate Professor of English.*
 James J. Lynch, Ph.D., *Associate Professor of English.*
 Gordon McKenzie, Ph.D., *Associate Professor of English (Vice-Chairman of the Department).*
 Thomas F. Parkinson, Ph.D., *Associate Professor of English.*
 Wayne Shumaker, 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.*
 Albert S. Cook, M.A., *Assistant Professor of English.*
 Sears R. Jayne, Ph.D., *Assistant Professor of English.*
 Harold D. Kelling, Ph.D., *Assistant Professor of English.*
 Charles S. Muscatine, Ph.D., *Assistant Professor of English.*
 John H. Raleigh, Ph.D., *Assistant Professor of English.*
 David W. Reed, Ph.D., *Assistant Professor of English.*
 Ernest Tuveson, Ph.D., *Assistant Professor of English.*
 Ian P. Watt, M.A. (Cantab.), *Assistant Professor of English.*
 Frank D. Dollard, Ph.D., *Instructor in English.*
 John H. Edwards, Ph.D., *Instructor in English.*
 Burton O. Kurth, M.A., *Associate in English.*



- Charles E. Beckwith, M.A., *Lecturer in English.*
 Alan M. Hollingsworth, M.A., *Lecturer in English.*
 Charles W. Jones, Ph.D., *Visiting Professor of English for the spring semester.*
 Robert D. Lundy, M.A., *Lecturer in English.*

Students must have passed Subject A before taking any course in English.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Jordan, Chairman; Mr. Bogard (fall semester), Mr. Kelling, Mr. Muscatine (spring semester), Mr. Potter, Mr. Reed, Mr. Shumaker.

The department offers alternative programs for the major: a program for the student who intends to become a candidate for the M.A. or the Ph.D. degree in English; a program for the general undergraduate.

Plan I. The program for the general undergraduate is as follows:

(A) *Preparation for the Major.*—First Year—Required: course 1A-1B (3-3), Composition and Study of Literature. Second Year—Required: course 46A-46B (3-3) and 3 additional units to be elected from courses 25 (3), 30 (3), 41 (3), 44A-44B (3-3), 49 (3).

(B) *The Major.*—Twenty-four units of upper division work with specific requirements as follows: Third Year—Required: the Junior Course, English

¹ In residence fall semester only, 1953-1954.

² In residence spring semester only, 1953-1954.

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 153.

Teacher Training.—Consult Mr. Evans or Mr. Lynch; see also the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Higher Degrees.—Consult Mr. Schorer; see also the ANNOUNCEMENT OF THE GRADUATE DIVISION 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. Beckwith, Mr. Bennion, Mr. Bogard, Mr. Bronson, Mr. Carter, Mr. Cook, Mr. Dollard, Mr. Edwards, Mr. Hollingsworth, Mr. Hutson, Mr. Jayne, Mr. Jones, Mr. Jordan, Mr. Kelling, Mr. Kurth, Mr. Lehman, Mr. Lundy, Mr. Lynch, Miss Miles, Mr. Potter, Mr. Raleigh, Mr. Reed, Mr. Shumaker, Mr. Tuveson, Mr. Watt

Prerequisite: a passing grade in Subject A (examination or course).

Credit for English 1A or 1B will not be given to any student who has not passed the Subject A examination or course.

1A. Training in writing and reading.

1B. An introduction to the study of literature, with further training in writing.

Prerequisite for the English major. Course 1A is prerequisite to 1B.

SOPHOMORE COURSES

*25. Language. (3) I.

Mr. Reed

The origins and symbols of human speech; patterns, change, and growth in language; the interrelations of language, thought, and civilization. Emphasis on English, as written and spoken in England and in America. Designed for sophomores, but open to students in the upper division.

* Not to be given, 1953–1954.

30. Introduction to American Literature. (3) II. Mr. Edwards
41. Writing in Connection with the Reading of Important Books of the Nineteenth and Twentieth Centuries. (3) I. Mr. Jordan
Prerequisite: course 1A-1B or Speech 1A-1B, or consent of instructor.
- 44A-44B. Masterpieces of Literature. (3-3) Yr. Mr. Jayne
Lectures on great works of the world's literature.
Course 44A is not prerequisite to 44B.
- 46A-46B. Survey of English Literature. (3-3) Yr.
Mr. Bogard, Mr. Caldwell, Mr. Cline, Mr. Dollard, Mr. Kelling,
Mr. Potter, Mr. Raleigh, Mr. Watt, Mr. Tuveson
Prerequisite: course 1A-1B.
Close study of typical works of major authors from Chaucer to Hardy,
with consideration of the more important aspects of English literary
history.
49. Ten Great Books in the British Tradition. (3) II. Mr. Cline

UPPER DIVISION COURSES

Group I—Unrestricted Courses

(Open to all students in the upper division; enrollment
not limited, except as noted)

A. COURSES IN COMPOSITION AND LANGUAGE

110. The English Language. (3) II. Mr. Reed
131. American English. (3) I. Mr. Reed
General description of the English language in America. Comparisons
with British English. American regional dialects.
- *141. Modes of Writing (Exposition, Fiction, Verse, etc.). (3) II. Mr. Parkinson
Prerequisite: course 1A-1B or Speech 1A-1B, or consent of instructor.
Open to qualified sophomores with consent of the instructor.
Writing in connection with readings in recent English literature and its
continental backgrounds.

B. COURSES IN LITERATURE

- 114A-114B. The English Drama. (3-3) Yr. Mr. Bogard, Mr. Durham
114A. From the miracle plays to 1642: Mr. Bogard.
114B. From 1642 to the present: Mr. Durham.
Course 114A is not prerequisite to 114B.
116. The English Bible as Literature. (3) I. Mr. Potter
- 117A-117B. Shakespeare. (3-3) Yr. Mr. Evans, Mr. Farnham
117A: Mr. Evans; 117B: Mr. Farnham.
Lectures on the entire works of Shakespeare, including nondramatic
poems. Open both to students whose major is English and to others. Course
117A is not prerequisite to 117B.
- 117E. Shakespeare. (3) I. Mr. Durham
Lectures on fifteen plays of Shakespeare. May not be taken by students
whose major is English.

* Not to be given, 1953-1954.

- 117J. Shakespeare. (3) II. Mr. Bronson
 Studies of selected plays, with practice in various critical approaches: e.g., establishing text, relation to source, changing concepts of comedy and tragedy, influence of physical conditions on technique. Limited to twenty-five students.
119. The Age of Johnson. (3) II. Mr. Bronson
120. Backgrounds of English Literature in the Middle Ages. (3) II. Mr. Jones
 A survey of medieval culture as it bears on English literature. Lectures and readings in medieval literature.
121. The Romantic Period. (3) II. Mr. Caldwell
122. The Victorian Period. (3) I. Mr. McKenzie
123. Nineteenth-Century British Prose. (3) I. Mr. Jordan
- 125B. The Novel in Western Civilization. (3) II. Mr. Cook
- 125C-125D. The English Novel. (3-3) Yr. Mr. Lehman
 Course 125C is not prerequisite to 125D.
- 125E. The American Novel. (3) I. Mr. Smith
128. Regional Literature: California and the West. (3) I. Mr. Hart
- 130A. American Literature Before 1840. (2) I. Mr. Smith
- 130B. American Literature: 1840-1885. (3) II. Mr. Carter
- 130C. American Literature: 1885 to the Present. (3) II. Mr. Stewart
132. The Transcendental Movement in American Literature. (3) II. Mr. Smith
- *149. The English Lyric. (3) I. _____
 The development of the English traditions of structure and style in lyric poetry.
- *152. Chaucer. (3) I. Mr. Shumaker
155. The Age of Chaucer. (3) II. Mr. Muscatine
- 158A-158B. The English Renaissance. (3-3) Yr. Mr. Cline, Mr. Potter
 158A: Mr. Cline; 158B: Mr. Potter.
 This course replaces the former English 156 (The Age of Elizabeth) and 157 (The Age of Milton).
 158A: Beginnings of the English Renaissance, and literature of the sixteenth century.
 158B: Literature of the seventeenth century.
 Course 158A is not prerequisite to 158B.
 Students who have taken course 156 or 157 may not take the corresponding part of course 158A-158B for credit.
160. British Literature from 1900 to the Present. (3) I. Mr. Schorer
- *161. Recent British and American Poetry. (3) I. _____
166. The Age of Swift and Pope. (3) I. Mr. Tuveson

Group II—Restricted Courses**A. THE JUNIOR COURSE**

(Sections limited to twenty students each)

Designed primarily for juniors whose major subject is English.

100. Methods and Materials of Literary Criticism. (3) I and II.

Mr. Bennion, Mr. Caldwell, Mr. Cook, Mr. Dollard,
Mr. Edwards, Mr. Kelling, Mr. Lehman, Mr.
Parkinson, Mr. Raleigh, Mr. Shumaker, Mr. Watt

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.

*151E. Henry James. (3) I. Mr. Raleigh

151J. Donne and Milton. (3) I and II. Mr. Potter, Mr. Shumaker
I: Mr. Potter; II: Mr. Shumaker.151K. Contemporary Authors. (3) I and II. Miss Miles, Mr. Schorer
I: T. S. Eliot, Miss Miles; II: D. H. Lawrence, Mr. Schorer.151L. Chaucer. (3) I and II. Mr. Bronson, Mr. Cline, Mr. Muscatine
I: Mr. Bronson, Mr. Muscatine; II: Mr. Cline.

151S. Shakespeare. (3) I and II. Mr. Bennion

*151Sp. Spenser. (3) II. Mr. Jayne

*151Sw. Swift. (3) II. Mr. Watt

151W. Whitman. (3) I. Mr. Carter

*151Wd. Wordsworth. (3) II. Mr. Jordan

198A-198B. Senior Preceptorial Course. (3-3) Yr.

198A: Mr. Raleigh; 198B: Mr. Kelling. Mr. Kelling, Mr. Raleigh

Reading in chosen fields, with critical writing.

Primarily for English majors in Plan II.

Course 198A is not prerequisite to 198B, but a student must have 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.

* Not to be given, 1953-1954.

D. ADVANCED COMPOSITION

(Open only to upper division students who have the consent of the instructor. With the consent of the instructor, courses numbered 106 may be repeated without duplication of credit.)

- 106A. Fiction. (3) I. Mr. Schorer
- 106B. Verse. (3) II. Miss Miles
- 106D. Literary Criticism. (3) I. Mr. Watt
- *106E. Long Narrative. (3) II. Mr. Stewart
The student will work throughout the semester on a single project, either fiction (novel) or nonfiction (biography, history).
- 106H. Expository and Critical Writing. (3) II. Mr. Muscatine
- 106L. Advanced Composition. (3) I and II. Mr. Evans, Mr. Lynch
I: Mr. Lynch; II: Mr. Evans.
Primarily for candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is English.
- 106M. Advanced Composition. (3) II. Mr. Tuveson
Specifically for candidates for the Certificate of Completion of the teacher-training curriculum whose teaching major is not English.

E. COMPREHENSIVE FINAL EXAMINATION

The Comprehensive Final Examination for Plan II of the undergraduate major in English must be taken at the end of the senior year. It will consist of three parts: a three-hour written examination on the history and criticism of literature to 1700; a similar examination on the period from 1700 to the present; and an oral examination of approximately half an hour, mainly factual in content. The student should attend any general conferences held by the board during the semester, and may consult individually with the members of the board. *The student's preparation for the examination presumably extends throughout the entire period of upper division residence.* Upon the student's passing the examination the grade assigned by the department, with the appropriate grade points, will be recorded.

Given at the end of the fall and spring semesters and at the beginning of the fall semester.

Mr. Tuveson (chairman), Mr. Carter, Mr. Hart (fall semester), Mr. Kelling, Mr. Muscatine (spring semester), Mr. Parkinson

TEACHERS' COURSE

300. Problems in Teaching English Literature and Composition in Secondary Schools. (2) I and II. Mr. Evans, Mr. Lynch
I: Mr. Evans; II: Mr. Lynch.

This course, designed for seniors and graduate students undertaking an English teaching major or minor, should be completed before practice teaching. The course is accepted in partial satisfaction of the 22-unit requirement in education for the general secondary credential.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Students who have not passed the department's examination in French or in German will be admitted to a seminar only with consent of the instructor.

* Not to be given, 1953-1954.

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, 212, 217, 218, 220B, 225A-225B, 228, 230A-230B, 235, 245, 247, 251A-251B, 254A-254B, 257A, 257B, 258, 262, 264, 266, 269.

Attention is directed to the fact that the period courses, 119, 121, 122, 123, 155, 158A-158B, 160, and 166, are particularly adapted to graduate study.

Since the courses listed as seminars are concerned with specific problems in the designated fields, the attention of graduate students desiring general surveys is directed to the following upper division courses: 119, 120, 121, 122, 123, 128, 130A, 130B, 130C, 155, 158A-158B, 160, and 166.

200. Techniques of Literary Scholarship. (3) I and II.

I: Mr. Jayne, Mr. Lynch; II: Mr. Jayne. Mr. Jayne, Mr. Lynch

*202. The History of English Criticism. (3) I.

Mr. Brightfield

†204. Celtic Studies. (3) I and II.

Mr. Hutson

This course may be repeated for credit.

208. Problems in the Study of Literature. (3) I and II.

Mr. Lehman, Miss Miles

Textual analysis, discussion of scholarly approaches, based on secondary reading; problems in the presentation of materials.

I: Comedy and Tragedy, Mr. Lehman; II: Seventeenth Century, Miss Miles.

*210. Chaucer. (3) I.

Mr. Cline

Some knowledge of Chaucer and his language is presupposed.

211A. Old English Literature. (3) I.

Mr. Brodeur, Mr. Hutson

Open to seniors with consent of the instructor.

Rapid reading of Old English texts.

211B. The Beowulf. (3) II.

Mr. Brodeur

211G-211H. Old and Middle English. (3-3) Yr.

Mr. Brodeur

Development of the English language from its beginning as illustrated in representative texts. Especially designed for candidates for the Ph.D. degree.

211J. Modern English. (3) I.

Mr. Reed

Continuation of 211G-211H. Development of standard English to the present; the structure of present-day English. Especially designed for candidates for the Ph.D. degree.

212. Old English Poetic Forms and Techniques. (3) II.

Mr. Brodeur

Prerequisite: two semesters of Old English.

213. Readings in Middle English. (3) I and II.

Mr. Brodeur, Mr. Hutson

I: Mr. Brodeur; II: Mr. Hutson.

Rapid reading of selections in Middle English, and perhaps some entire poems, from the twelfth century to the fifteenth.

*217. Studies in Shakespeare. (3) II.

*218. Milton. (3) II.

Mr. Potter

* Not to be given, 1953-1954.

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

- 220A*-220B. The Medieval Mind. (3-3) Yr. ———, Mr. Jones
 *220A. Readings in Medieval Latin: ———.
 220B. Dominant Themes in Medieval Life: Mr. Jones.
 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
- *228. Regional Literature: California and the West. (3) II. Mr. Hart
- 230A-230B. American Literature. (3-3) Yr. Mr. Carter, Mr. Hart
 230A: Mr. Hart; 230B: Mr. Carter.
235. Mark Twain. (3) II. Mr. Smith
- *245. Spenser. (3) II. Mr. Jayne
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
 Course 254A is not prerequisite to 254B.
- 257A. Literary Criticism, 1750-1850. (3) I. Mr. McKenzie
 257B. Methods and Assumptions of Recent Literary Critics. (3) II. Mr. Shumaker
258. Johnson and His Contemporaries. (3) I. Mr. Bronson
- *262. Nineteenth-Century Literature. (3) II. Mr. 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)
 This course is normally reserved for students directly engaged upon the doctoral dissertation.
 The members of the department are variously engaged in particular research and stand ready to advise and direct properly qualified graduate students in their several fields. Some indication of fields of interest is here-with suggested:
1. Critical Theory (Brightfield, Caldwell, McKenzie, Miles, Schorer, Shumaker).
 2. Prose Fiction (Brightfield, Lehman, Raleigh, Schorer).
 3. Drama (Bennion, Bogard, Evans, Farnham).
 4. Poetry (Caldwell, Miles, Parkinson).
 5. Linguistics (Brodeur, Hutson, Reed).
 6. Early Germanic Literature (Brodeur).
 7. Celtic (Hutson).
 8. The Ballad (Bronson).
 9. Chaucer and the Middle Ages (Brodeur, Caldwell, Cline, Muscatine, Shumaker).
 10. Shakespeare, Donne, Sixteenth and Seventeenth Centuries (Bennion, Cline, Farnham, Jayne, Miles, Potter, Shumaker).

* Not to be given, 1953-1954.

11. Eighteenth Century (Bronson, Kelling, Lynch, Schorer, Tuveson, Watt).
 12. Nineteenth Century (Bennion, Brightfield, Caldwell, Jordan, Lehman, McKenzie).
 13. Twentieth Century (Hart, Lehman, Parkinson, Schorer, Stewart).
 14. American Literature (Carter, Hart, Smith, Stewart).
299. Special Study. (1-3) I and II. The Staff (Mr. Schorer in charge)
This course is primarily for students engaged in preliminary exploration of a restricted field, involving research and the writing of a report. It may not be substituted for available seminars.

RELATED COURSES

- Romanticism in Western Europe (Comparative Literature 121).
The Renaissance in the Literatures of Italy, France and England (Comparative Literature 151A-151B).
The Symbolist Movement in European Literature (Comparative Literature 201A-201B).

ENTOMOLOGY AND PARASITOLOGY

(Department Office, 112 Agriculture Hall)

- Roderick Craig, Ph.D., *Professor of Entomology.*
Edward O. Essig, M.S., *Professor of Entomology.*
William M. Hoskins, Ph.D., *Professor of Entomology.*
E. Gorton Linsley, Ph.D., *Professor of Entomology (Chairman of the Department).*
Morris A. Stewart, Ph.D., *Professor of Parasitology.*
Robert L. Usinger, Ph.D., *Professor of Entomology.*
Merlin W. Allen, Ph.D., *Associate Professor of Entomology.*
Julius H. Freitag, Ph.D., *Associate Professor of Parasitology.*
² Deane P. Furman, Ph.D., *Associate Professor of Entomology.*
Dilworth D. Jensen, Ph.D., *Associate Professor of Entomology.*
Abraham E. Michelbacher, Ph.D., *Associate Professor of Entomology.*
A. Earl Pritchard, Ph.D., *Associate Professor of Entomology.*
Edward A. Steinhaus, Ph.D., *Associate Professor of Insect Pathology.*
Richard L. Doutt, Ph.D., *Assistant Professor of Biological Control.*
John W. MacSwain, Ph.D., *Assistant Professor of Entomology.*
Woodrow W. Middlekauff, Ph.D., *Assistant Professor of Entomology.*
Ray F. Smith, Ph.D., *Assistant Professor of Entomology.*
Edward S. Sylvester, Ph.D., *Assistant Professor of Entomology.*



- Richard M. Bohart, Ph.D., *Associate Professor of Entomology, Davis.*
Arthur D. Borden, M.A., *Lecturer in Entomology.*
Alfred M. Boyce, Ph.D., *Professor of Entomology, Riverside.*
Stanley E. Flanders, Ph.D., *Professor of Biological Control, Riverside.*
Norman W. Frazier, Ph.D., *Lecturer in Entomology.*
Harold T. Gordon, Ph.D., *Lecturer in Entomology.*
Harold F. Madsen, Ph.D., *Lecturer in Entomology.*

² In residence spring semester only, 1953-1954.

Letters and Science List.—Courses 100, 106, 110, 112, 117, 119, 126, 127, 129, 131, 133 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. MacSwain.

49. Summer Field Course. (No credit) Mr. MacSwain, Mr. Bohart
Six weeks, daily, except Sunday.
Prerequisite: one course in entomology or approval of instructor.
The study and collection of insects in their natural habitats, with special emphasis on ecology, life histories, and field recognition.

UPPER DIVISION COURSES

100. General Entomology. (4) I. Mr. MacSwain
Lectures and laboratory.
An introduction to the classification, life histories, morphology, physiology, and ecology of insects.
106. Introduction to Structure and Function of Insects. (5) II. Mr. Craig
Lectures and laboratory.
Prerequisite: course 100 or equivalent.
Comparative anatomy and physiology of selected insect types; histological techniques; general principles of insect physiology.
110. Insect Physiology. (3) I. Mr. Craig
Lectures and laboratory.
Prerequisite: course 106, Chemistry 8, or equivalent.
Detailed consideration of nutrition, digestion, excretion, circulation, respiration, and the nervous and hormonal systems of insects.
112. Systematic Entomology. (4) I. Mr. Linsley, Mr. Usinger
Lectures and laboratory.
Prerequisite: course 100 or consent of instructor.
The classification of insects, taxonomic categories and procedure; bibliographical methods; nomenclature; museum practices.
114. Forest Entomology. (3) I. Mr. MacSwain
Lectures and laboratory.
Prerequisite: not open to entomology majors without special consent of instructor.
The identification, life histories, ecology and control of insects affecting western forests and forest products.
117. Helminthology. (4) I. Mr. Stewart, Mr. Furman
Lectures and laboratory.
Helminthic infections of man and domestic animals. Biology, host-parasite interrelationships, identification, prophylaxis, and therapeutics.
118. Plant Nematology. (4) II. Mr. Allen
Lectures and laboratory.
Identification, morphology, biology, and distribution of plant-parasitic and associated nematodes. Symptomatology, pathology, and control of nematode infections in cultivated crops. Techniques employed in the manipulation and examination of soil and infected plants.
119. Acarology. (2) I. Mr. Pritchard
Lectures and laboratory.
Prerequisite: course 112 or consent of instructor.
The taxonomy, biology, and ecology of mites and ticks. Laboratory rearing techniques and slide preparation methods.

124. Economic Entomology. (4) II. Mr. Essig
Lectures and laboratory.
Life histories, habits, distribution, economics, and control of insects attacking agricultural crops and stored products.
125. Insect Vectors of Plant Diseases. (4) I. Mr. Freitag, Mr. Sylvester, Mr. Jensen, Mr. Frazier
Lectures and laboratory.
Prerequisite: Plant Pathology 120 or consent of instructor.
The role of insects in the transmission and causation of plant diseases. Laboratory studies of disease symptoms, host ranges, methods of transmission and properties of plant viruses.
126. Medical Entomology. (4) II. Mr. Stewart, Mr. Furman
Lectures and laboratory.
The role of insects and other arthropods in transmission and causation of diseases of humans and domestic animals.
127. Insect Ecology. (3) II. Mr. Smith
Prerequisite: upper division standing in one of the biological sciences.
Principles of ecology with examples from the insects; insect behavior; analysis of the insect environment; population dynamics.
128. Chemistry of Insecticides and Fungicides. (4) I. Mr. Hoskins, Mr. Gordon
Lectures and laboratory.
Prerequisite: Chemistry 8, or consent of instructor.
Chemical composition and reactions of insecticides and fungicides, and their physiological effects on plant and animal tissues.
129. Biological Control of Insect and Weed Pests. (3) I. Mr. Doutt
Lectures and laboratory.
Prerequisite: course 100 or consent of instructor.
Principles and methods of biological control; biology of entomophagous insects; critical discussion of important world projects.
130. Insects in Relation to Deciduous Fruit and Nut Crops. (3) II. Mr. Borden, Mr. Madsen
Lectures and laboratory (field trip).
Prerequisite: course 124.
An advanced course on the biology, ecology, recognition and control of insects and related pests of major deciduous fruits and nuts in California. Emphasis on application methods and the principles of experimental field entomology.
131. Insect Pathology. (4) II. Mr. Steinhaus
Lectures and laboratory.
Prerequisite: course 100, and at least one course in mycology, or bacteriology, or protozoölogy.
General insect pathology and microbiology, including biological relationships between microörganisms 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 Insects. (4) II. Mr. Usinger
Lectures and laboratory.
General and applied limnology, with special reference to insects. Laboratory exercises on the life histories and identification of aquatic insects. Field trips for the study of stream and lake survey methods.

135. Insects in Relation to Flowering and Other Ornamental Plants. (3) I.
Lectures and laboratory. Mr. Pritchard
Prerequisite: course 124.
The study of the importance, recognition, taxonomy, biology, ecology,
and control of insects and related pests of flowering and other ornamental
plants.
136. Insects in Relation to Vegetable and Field Crops. (4) II.
Mr. Michelbacher, Mr. Middlekauff
Lectures and laboratory; one or more field trips.
Prerequisite: course 124.
The major insects and related organisms attacking commercial vege-
table and field crops in California; their biology, ecology, distribution,
diagnosis, and cultural and chemical control.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Linsley in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 200A-200B. Research in Entomology and Parasitology. (1-6; 1-6) Yr.
The Staff (Mr. Linsley in charge)
(Formerly numbered 201A-201B.)
- 201A-201B. Seminar in Economic Entomology. (1-1) Yr.
(Formerly numbered 200A-200B.) Mr. Pritchard, Mr. Jensen
- 202A-202B. Seminar in Parasitology. (1-1) Yr. Mr. Stewart, Mr. Furman
- 203A-203B. Seminar in Insect Toxicology and Insect Physiology. (1-1) Yr.
Mr. Craig, Mr. Hoskins, Mr. Gordon
- 204A-204B. Seminar in Insect Pathology. (1-1) Yr. Mr. Steinhaus
- 205A-205B. Seminar in Systematic Entomology. (1-1) Yr.
Mr. Linsley, Mr. MacSwain, Mr. Usinger
- 206A-206B. Staff Seminar in Entomology. (No credit) Yr.
The Staff (Mr. Linsley in charge)
210. Insect Biochemistry. (3) I. Mr. Craig, Mr. Gordon, Mr. Hoskins
Lectures and laboratory.
Prerequisite: courses 110 and 128. Recommended: courses 106, 112, and
127; Biochemistry 103.
Interpretation of ecological specializations, including parasitism and
host specificity, on the basis of nutrition and enzyme mechanisms. In alter-
nate years emphasis is placed on the action of toxic chemicals, resistance to
insecticides, bioassay methods, and interpretation of experimental results.
212. Principles of Systematic Entomology. (3) II.
Mr. Linsley, Mr. Usinger
Prerequisite: course 112, or consent of instructor.
The theory and philosophy of systematic entomology with emphasis on
phylogeny, zoogeography, and nomenclature.
226. Advanced Medical Entomology. (2) I. Mr. Stewart, Mr. Furman
Prerequisite: courses 117 and 126; Bacteriology 101. Recommended:
courses 106, 112, and 127.
The genesis of arthropod-borne diseases.

232. History of Entomology. (3) II. Mr. Essig
Prerequisite: course 100 and one additional course in entomology.
Outline of the development of world entomology.

(GIVEN AT RIVERSIDE)

GRADUATE COURSES

- 200A-200B. Seminar in Entomology, Including Biological Control. (1-1) Yr.
The Staff (Entomology, Mr. Boyce in charge;
Biological Control, Mr. Flanders in charge)
- 201A-201B. Research in Entomology. (2-6; 2-6) Yr. Mr. Boyce
- 205A-205B. Research in Biological Control. (2-6; 2-6) Yr. Mr. Flanders

FOOD TECHNOLOGY

(Department Office, 333 Hilgard Hall)

- William V. Cruess, Ph.D., *Professor of Food Technology.*
Maynard A. Joslyn, Ph.D., *Professor of Food Technology.*
Gordon Mackinney, Ph.D., *Professor of Food Technology.*
Emil M. Mrak, Ph.D., *Professor of Food Technology, Davis (Chairman of Department).*
Herman J. Phaff, Ph.D., *Associate Professor of Food Technology, Davis.*

UPPER DIVISION COURSES

112. Principles and Practices of Food Processing. (3) II. Mr. Cruess
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) I. Mr. Mackinney
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.
- *116. Yeasts and Related Organisms. (4) II. Mr. Joslyn, Mr. Mrak, Mr. Phaff
Lectures and laboratory.
Prerequisite: thirteen units of chemistry, including organic; 4 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) I. Mr. Mackinney
Lectures and laboratory.
Prerequisite: three units of biochemistry or plant biochemistry, or upper division organic chemistry.
Chemistry of natural pigments and related compounds; spectrophotometric and chromatographic techniques; special emphasis on pigments in relation to foods.

* Not to be given, 1953-1954.

127. Recent Advances in Food Technology. (1) II. Mr. Cruess
 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. Cruess in charge)

GRADUATE COURSES

- 200A-200B. Seminar in Food Technology. (1-1) Yr.
 Mr. Mackinney, Mr. Joslyn
- 237A-237B. Research in Food Technology. (1-9; 1-9) Yr.
 The Staff (Mr. Joslyn in charge)

FOREIGN LITERATURE IN TRANSLATION

The following courses offered in the departments of language and literature do not require a reading knowledge of any foreign language.

Classics *34. Epic Poetry: Homer and Vergil.

35. Greek Tragedy.

37A-37B. Survey of Greek Literature.

135. Greek and Roman Comedy.

178. Greek and Roman Mythology.

180A-180B. The Latin Classics in English.

French 39A-39B-39C. French Literature in English Translation.

122A-122B. French Literature of the Middle Ages.

*123A-123B. Renaissance and Reformation in French Literature.

*124A-124B. Voltaire and the Enlightenment.

126A-126B. Readings in Contemporary French Literature.

German 39A-39B-39C-39D. Great Writers in German Literature.

Italian 150A-150B. Dante's *Divine Comedy* in English Translation.

Near Eastern Languages 110A-110B. Great Books of Near Eastern Literature.

Oriental Languages 38A-38B. Great Books of Eastern Asia.

*112A-112B: Survey of Chinese Literature and Literary Criticism.

132. History of Japanese Literature.

Scandinavian *100A-100B. History of Scandinavian Literature.

106. History of Scandinavian Drama up to 1900.

107. The Plays of Ibsen.

108. Strindberg and His Writings.

109. Scandinavian Drama of the Twentieth Century.

*113. Romanticism in Norway.

*114. The Works of Holberg and Oehlenschläger.

*120A-120B. The Novel in Scandinavia.

125. Masterpieces of Old Norse Literature.

* Not to be given, 1953-1954.

- Slavic Languages and Literatures 30. Great Writers of Russian Literature.
 130. Introduction to Russian Literature.
 131. Russian Literature (1880-1917).
 *132. Russian Literature Since 1917.
 *133A. Russian Novelists of the Nineteenth Century (except Tolstoy and Dostoevski).
 *133C. Dostoevski.
 *133D. Tolstoy.
 133F. Chekhov.
 *134. Russian Folklore.
 135. The Russian Drama.
 *140. Survey of Slavic Literatures.
 *151. Polish Literature: Sixteenth to Eighteenth Centuries.
 *153. Polish Literature of the Post-Romantic Period.
 154. Polish and Russian Romanticism.
 160. Survey of Czech and Slovak Literature.
 161. Czech and Slovak Literature of the Nineteenth Century.
 170. Survey of South Slavic Literatures.
 180A-180B. Survey of Russian Culture.
 182. History of Polish Culture.
- Spanish 39A-39B-39C-39D. Spanish and Spanish-American Literature in English Translation.

FORESTRY

(Department Office, 243 Forestry Building)

- Frederick S. Baker, F.E., *Professor of Forestry (Chairman of the Department)*.
 Percy M. Barr, Ph.D., Sc.D., *Professor of Forestry*.
 Harold H. Biswell, Ph.D., *Professor of Forestry*.
 Robert A. Cockrell, Ph.D., *Professor of Forestry*.
 Emanuel Fritz, M.E., M.F., *Professor of Forestry*.
 Joseph Kittredge, Jr., Ph.D., *Professor of Forestry*.
 Myron E. Krueger, M.S., Sc.D., *Professor of Forestry*.
 Henry J. Vaux, Ph.D., *Professor of Forestry*.
 Walter Mulford, F.E., Sc.D., *Professor of Forestry, Emeritus*.
 Arthur W. Sampson, Ph.D., *Professor of Forestry, Emeritus*.
 Robert N. Colwell, Ph.D., *Associate Professor of Forestry*.
 R. Keith Arnold, Ph.D., *Assistant Professor of Forestry*.
 Harold F. Heady, Ph.D., *Assistant Professor of Forestry*.
 Edward C. Stone, Ph.D., *Assistant Professor of Forestry*.
 John A. Zivnuska, Ph.D., *Assistant Professor of Forestry*.



Arthur B. Anderson, Ph.D., *Lecturer in Forestry*.

Letters and Science List.—Courses 1, 103, 122, and 125 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

LOWER DIVISION COURSES

1. Elements of Forestry. (3) I. Mr. Cockrell
 Not open to students with a major in forestry.
 Forests in their relation to national life; the life history of the tree and the forest; general principles of forestry.

* Not to be given, 1953-1954.

- 49F. Forestry Field Practice Course. (No credit) Mr. Arnold
(Formerly numbered 49.)
Prerequisite: Engineering 1A, Botany 1, and an average grade of C or higher.
Approximately eleven weeks of field laboratory work in forest surveys and mapping, forest mensuration, silviculture, logging, and milling operations at Meadow Valley near Quincy in the Plumas National Forest.
- 49R. Range Management Field Practice Course. (No credit) Mr. Heady
Six weeks devoted to field studies of range conditions and methods of utilization in various parts of the state. Required of all students with a major in range management.

UPPER DIVISION COURSES

Course 49F 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) I. Mr. Biswell
Basic principles of range management and development in the United States; relation to agriculture and wild-land management.
102. Range Management Technique. (3) II. Mr. Heady
Lecture and laboratory.
Prerequisite: course 103; Engineering 1A. Botany 108 recommended.
Field and laboratory procedure in determination of range adequacy and quality. Special field trips will be arranged.
103. Principles of Forest Ecology. (3) I. Mr. Stone
Prerequisite: Botany 1, Chemistry 1A.
Structure of the plant as modified by conditions of habitat; plant succession and societies.
104. Silviculture. (4) I. Mr. Baker
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. Mr. Colwell
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. Mr. Stone
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 49F.
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 instructor.
Organization and characteristics of the lumber industry; the manufacture of lumber from log pond to finished product; seasoning, grading, marketing.
114. Wood Technology. (3) II. Mr. Fritz
Lecture and laboratory.
Prerequisite: Chemistry 1A, Botany 1.
Junior and senior students from other departments may be admitted with consent of instructor.
Anatomy of wood; properties and uses; identification of commercial species.
115. Physical Properties of Wood. (3) I. Mr. Cockrell
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.
- 121A-121B. Forest Economics. (3-3) Yr. Mr. Vaux, Mr. Zivnuska
Prerequisite: 6 units of economics and senior standing. Upper division and graduate students from other departments may be admitted with consent of instructor.
Course 121A not prerequisite to 121B.
121A. (Formerly numbered 121.) Economics of forest land and timber.
121B. Economics of utilization and distribution of forest products.
122. Forest Policy. (3) I. Mr. Vaux
Prerequisite: 6 units of economics and senior standing.
The evolution of forest policy in the United States. State and national forest policies. Policy objectives, programs, and groups. Analysis of current policy problems.
123. Range Forage Utilization. (3) I. Mr. Biswell
Lecture and laboratory.
Prerequisite: course 49R or 101.
Principles of range forage utilization and effects; forage preference of animals; control means to obtain proper utilization. Special field trips will be arranged.

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.
130. Industrial Forestry. (3) II. Mr. Barr
Prerequisite: senior standing. Senior and graduate students from other departments may be admitted with consent of instructor.
The application of forest management to large properties under private ownership; nature and development of the industrial forest enterprise; costs and returns; integration of forest industries; status and trends of American industrial forestry.
132. Forest Photogrammetry. (3) II. Mr. Colwell
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.
133. Grassland Ecology. (3) II. Mr. Heady
Prerequisite: course 103.
Composition, structure, development, and habitat factors of the native North American grasslands. Principles of grassland management for forage production.
198. Directed Group Study. (1-5) I and II. The Staff (Mr. Baker in charge)
Prerequisite: senior standing and consent of instructor.
Group study, or investigation, of special problems.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff (Mr. Baker in charge)
Prerequisite: senior standing and consent of instructor.
This course may also be taken during the summer at the Forestry Camp at Meadow Valley, Plumas County.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 201A-201B. Seminar in Forestry. (2-2) Yr. Mr. 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. Mr. Stone
 Prerequisite: course 104.
205. Seminar in Wood Technology. (2) I. Mr. Cockrell
 Prerequisite: course 114.
206. Seminar in Forest Management. (2) II. Mr. Barr
 Prerequisite: course 120, 6 units of economics.
- 207A-207B. Seminar in Forest Economics. (2-2) Yr.
 207A: Mr. Vaux; 207B: Mr. Zivnuska. Mr. Vaux, Mr. Zivnuska
 Prerequisite: 12 units of economics, agricultural economics, or forest
 economics.
 Course 207A is not prerequisite to 207B.
- 208A-208B. Seminar in Range Management. (2-2) Yr.
 208A: Mr. Biswell; 208B: Mr. Heady. Mr. Biswell, Mr. Heady
 Prerequisite: course 133.
 Course 208A is not prerequisite to 208B.

FRENCH

(Department Office, 4125 Dwinelle Hall)

Clarence D. Brenner, Ph.D., *Professor of French (Chairman of the Department)*.

Francis J. Carmody, Ph.D., *Professor of French*.

*Jacqueline de La Harpe, Docteur ès Lettres (Lausanne), *Professor of French*.

Percival B. Fay, Ph.D., *Professor of French*.

Arnold H. Rowbotham, Ph.D., *Professor of French*.

Ronald N. Walpole, Ph.D., *Professor of French*.

Mathurin Dondo, Ph.D., *Associate Professor of French, Emeritus*.

Clifford H. Bissell, Ph.D., *Associate Professor of French*.

Edward F. Meylan, Ph.D., *Associate Professor of French*.

Warren Ramsey, Ph.D., *Associate Professor of French and Comparative Literature*.

*Alvin A. Eustis, Jr., Ph.D., *Assistant Professor of French*.

Irving Putter, Ph.D., *Assistant Professor of French*.

Annette Berent, Docteur de l'Université de Paris, *Instructor in 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 7.

Departmental Major Adviser: Mr. Meylan.

* Absent on leave, 1953-1954.

Preparation for the Major. Required: courses 1, 2, 3, 4, 25, or their equivalents. (Students who receive grade A or B in French 4 will be admitted to the upper division courses without the requirement of course 25.) History 4A-4B, Philosophy 20A-20B, English 1A-1B, and Latin are strongly recommended.

The Major.—Required: courses 101A-101B, 109A-109B, and either 112A-112B, 120A-120B, or 121A-121B.

Any of the remaining upper division courses may be counted for the major with the exception of 108A-108B, 122A-122B, 123A-123B, 124A-124B, and 126A-126B; however, with the permission of the department, 4 units of the 24 may be satisfied by appropriate upper division courses in the following departments: Classics, English, German, History, Italian, Philosophy, or Spanish. Students who fail to maintain an average of one grade point or better for each unit of work undertaken in the upper division courses in the Department of French will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major in French.

Honors.—To be recommended for honors at graduation, students must have completed with distinction the courses included in the major.

LOWER DIVISION COURSES

In courses 2, 3, 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. Ramsey in charge
Sections meet five hours per week.
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. Loy in charge
Sections meet five hours per week.
Prerequisite: three years of high school French or course 2 or course 12.
Students who have hitherto specialized in reading will ordinarily be allowed to transfer to conversation sections of course 3 only if they have received a grade of A or B in course 2 or course 12.
4. Intermediate French. Composition and Conversation. (4) I and II.
Sections meet five hours per week. Miss Dufrenoy in charge
Prerequisite: four years of high school French or course 3 (conversation).
- 4R. Intermediate French. Reading. (4) I and II. Mr. Putter in charge
Reading and translation.
Prerequisite: course 3 (reading) or four years of high school French.
Not recommended for students who wish to take course 25 or upper division work.
20. French Pronunciation. (1) I and II. Miss Dufrenoy in charge
Prerequisite: course 2 or equivalent.
A course in the pronunciation of French for students on the intermediate level.
25. Advanced French. (3) I and II. Mr. Bissell
Prerequisite: course 4, or course 4R with grade A or B.

1G. French for Graduate Students. (No credit) I and II.

Mr. Putter in charge.

Preparation for the graduate reading examinations.

UPPER DIVISION COURSES

The prerequisite to all upper division courses is 16 units of lower division courses, including course 4 with grade A or B, or course 25.

Courses 101A-101B and 109A-109B must usually be taken before any other upper division course, with the exception of courses 108 and 125.

101A-101B. Intensive Reading, Grammar, and Composition. (3-3) Yr.

Beginning each semester.

Mr. Brenner in charge

108A-108B. Readings in French Literature. (3-3) Yr.

Mr. Meylan

Prerequisite: course 4 or 4R, or equivalent.

The masterpieces of French literature read in French, with classroom work in English. Does not satisfy any requirement for the major in French.

109A-109B. A Survey of French Literature from the Middle Ages to the Present. (3-3) Yr.

Mr. Putter in charge

112A-112B. The Nineteenth Century. (2-2) Yr.

Mr. Carmody

114A-114B. Contemporary French Literature. (2-2) Yr.

Mr. Ramsey

*115A-115B. Modern French Drama. (2-2) Yr.

Mr. Brenner

115A. Nineteenth Century; 115B. Twentieth Century.

*116A-116B. French Literature from 1885 to 1914. (2-2) Yr.

Mr. Carmody

120A-120B. The Seventeenth Century. (2-2) Yr.

Mr. Fay

121A-121B. The Eighteenth Century. (2-2) Yr.

Mr. Rowbotham

125. Advanced French Pronunciation. (1) I and II.

Mr. Meylan

Course 125 is required of all candidates for the Certificate of Completion in French. Normally to be taken in the junior year.

130A-130B. Advanced Grammar and Composition. (3-3) Yr.

Mr. 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 for all candidates for the M.A. degree.

A course in the development of an ability to write good literary French.

134A-134B. Survey of French Culture and Institutions. (2-2) Yr.

Miss Habis-Reutinger

Required of all candidates for the Certificate of Completion in French.

*160. Contemporary Literature. (2) II.

Prerequisite: course 101A-101B and 109A-109B.

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

The Staff (Mr. Meylan in charge)

* Not to be given, 1953-1954.

COURSES IN WHICH NO KNOWLEDGE OF FRENCH IS REQUIRED

39. French Literature in English Translation. (2)
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. Putter (in charge), Mr. Loy, Mr. Meylan,
Mr. Rowbotham, Mr. Walpole
- 39B. The Nineteenth Century. (2) II.
No prerequisite.
Mr. Loy, Mr. Meylan, Mr. Putter,
Mr. Rowbotham, Mr. Walpole
- 39C. The Contemporary Period. (2) I. Mr. Loy
Prerequisite: course 39B or consent of the instructor.
- 122A-122B. French Literature of the Middle Ages. (2-2) Yr. Mr. Walpole
122A. Epic, romance, history.
122B. Drama, lyric and allegorical poetry.
- *123A-123B. Renaissance and Reformation in French Literature. (2-2) Yr.
Mr. Meylan
- *124A-124B. Voltaire and the Enlightenment. (2-2) Yr. Mr. Rowbotham
Prerequisite: upper division standing.
A study of the period of Enlightenment (seventeenth and eighteenth centuries) using the work of Voltaire as a central point, with excursions into the work of other writers in France and abroad.
- 126A-126B. Readings in Contemporary French Literature. (2-2) Yr.
Mr. Carmody
Prerequisite: junior or senior standing and other specially qualified students.
The masterpieces of French literature of today read in English translation.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- Course 201A or 206A is required of all candidates for the M.A. degree.
- 201A-201B. Historical Grammar. (3-3) Yr. Mr. Walpole
- *202A-202B. Studies in Medieval French Literature. (2-2) Yr.
Reading knowledge of Old French required. Mr. Walpole
- *204A-204B. Studies in the French Eighteenth Century. (2-2) Yr.
204A. Voltaire and the Philosophers. Mr. Rowbotham
204B. Jean-Jacques Rousseau.
Courses 204A-204B, 207A-207B, 210A-210B will be offered in rotation, one each year.
- 206A-206B. Reading and Interpretation of Typical Old French Texts.
(2-2) Yr. Mr. Fay
- *207A-207B. Studies in the Eighteenth-Century Novel. (2-2) Yr.
Mr. Rowbotham
- 210A-210B. Studies in the Eighteenth-Century Drama. (2-2) Yr.
Mr. Brenner

* Not to be given, 1953-1954.

- *214A-214B. French Versification. (2-2) Yr. Mr. Ramsey
- *215. Seminar in Contemporary Literature. (2-2) Yr. Mr. Ramsey
- *217. Studies in the French Renaissance. (2) I. Mr. Meylan
- *218A-218B. French Classicism. (2-2) Yr. _____
- 219A-219B. Aspects of French Romanticism. (2-2) Yr. Mr. Rowbotham
- 220A-220B. Explication de Textes. (2-2) Yr. Miss Bercut
- *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)

RELATED COURSES

- Romanticism in Western Europe (Comparative Literature 121). _____
- The Renaissance in the Literatures of Italy, France and England (Comparative Literature 151A-151B).
- The Symbolist Movement in European Literature (Comparative Literature 201A-201B).

GENETICS

(Department Office, 314 Hilgard Hall)

- Roy E. Clausen, Ph.D., *Professor of Genetics (Chairman of the Department)*.
- G. Ledyard Stebbins, Jr., Ph.D., *Professor of Genetics, Davis*.
- Ernest B. Babcock, M.S., LL.D., *Professor of Genetics, Emeritus*.
- Everett R. Dempster, Ph.D., *Associate Professor of Genetics*.
- James A. Jenkins, Ph.D., *Associate Professor of Genetics*.
- Spencer W. Brown, Ph.D., *Assistant Professor of Genetics*.



- I. Michael Lerner, Ph.D., *Professor of Poultry Husbandry*.
- Curt Stern, Ph.D., *Professor of Zoölogy*.
- Donald R. Cameron, Ph.D., *Lecturer in Genetics*.

Letters and Science List.—All undergraduate courses in genetics are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Brown.

The Major.—Course work leading to the degree of Bachelor of Science may be undertaken subject to the requirements of the College of Agriculture (see page 80 of the CIRCULAR OF INFORMATION). Students may elect to follow either the animal science curriculum (see page 81 of the CIRCULAR OF INFORMATION) or the plant science curriculum (see page 85 of the CIRCULAR OF INFORMATION).

* Not to be given, 1953-1954.

UPPER DIVISION COURSES

100. Principles of Genetics. (4) I. Mr. Dempster
Lectures and laboratory.
Prerequisite: general botany or general zoölogy.
Introduction to genetics with some consideration of its applications in agriculture, biology, and human welfare.
Credit in this course is limited to one unit for students who have received credit for Zoölogy 114.
101. Cytogenetics. (3) II. Mr. Clausen
Prerequisite: course 100 and general cytology.
Genetics as related to cytological conditions, with particular reference to plant materials. Genetics 101C may be taken concurrently.
- 101C. Cytogenetics Laboratory. (2) II. Mr. Brown, Mr. Cameron
Prerequisite: course 101 (may be taken concurrently).
Laboratory study of chromosome morphology and behavior as related to problems in genetics.
102. Biometrical Genetics. (4) I. Mr. Jenkins
Lectures and laboratory.
Prerequisite: course 100, or equivalent.
With special reference to the application of statistical methods.
- 103A-103B. Organic Evolution. (2-2) Yr. Mr. Stebbins
(Formerly numbered 103.)
Prerequisite: elementary genetics, elementary botany or zoölogy, and taxonomy or cytology. Genetics 103A is not prerequisite to 103B.
Organic evolution from the dynamic point of view. Lectures, student reports, discussion.
104. Physiological Genetics. (3) I. Mr. Brown
Prerequisite: course 100 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: course 102.
A study of the genetic forces operating in artificial selection. Discussion and formulation of breeding plans on the basis of the principles of population genetics with special reference to animals.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Clausen in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

200. Research in Genetics. (1-6) I and II.
The Staff (Mr. Clausen in charge)
201. Staff Seminar in Genetics. (No credit) I and II.
The Staff (Mr. Clausen in charge)
Weekly meeting for the presentation of special topics by members of the staff, visiting investigators, and graduate students.
202. Graduate Seminar in Genetics. (1-4) I and II.
The Staff (Mr. Clausen in charge)
Intensive study of special topics in genetics, under supervision of members of the staff.

GEOGRAPHY

(Department Office, 230 Giannini Hall)

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.*

Clarence J. Glacken, Ph.D., *Assistant Professor of Geography.*

James J. Parsons, Ph.D., *Assistant Professor of Geography.*

Erhard Rostlund, Ph.D., *Assistant Professor of Geography.*



Edwin M. Loeb, Ph.D., *Lecturer in Geography for the spring semester.*

Nicholas T. Mirov, Ph.D., *Lecturer in Geography.*

Letters and Science List.—All undergraduate courses in geography are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Rostlund.

Preparation for the Major.—Required: 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 122; Soil Science 101, 105.

Each program should normally include courses 101 or 102, 105A, 121A or 121B, 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. Glacken
Two lectures and two section meetings per week.
The distribution of the world's resources and industries.
5A. Agricultural production in its regional differentiation.
5B. Mineral resources, manufacturing regions, trade routes, and trade centers.
Either half of the course may be taken independently.

UPPER DIVISION COURSES

- *101. Field Geography. (3) I. _____
Field trips Saturdays.
Field study of a unit area with systematic mapping of the elements that constitute the natural region and of the forms of its utilization. Admission only after consultation with instructor.

* Not to be given, 1953-1954.

† Absent on leave, 1953-1954.

102. Field Geography. (3) II. Mr. Glacken
 Field trips Saturdays.
 Study of type areas of physical and cultural interest. Admission only after consultation with instructor.
- 105A-105B. Cartography. (3-3) Yr. Mr. Leighly
 One lecture hour and two three-hour laboratory periods per week.
 105A: Map Projections. 105B: Map Content.
 Prerequisite: consent of instructor.
- *108. Analysis of Land Forms. (3) I. Mr. Kesseli
 Origin of land forms. Review of the varied interpretation of processes involved, with emphasis on recent views.
- *109. Topographical Photo Interpretation. (3) II. Mr. Kesseli
 One lecture hour and two two-hour laboratory periods per week.
 The identification and classification of data on air photographs; the solution of selected problems in photogrammetry. Admission only after consultation with instructor.
111. Elementary Meteorology. (3) I. Mr. Leighly
 Prerequisite: a knowledge of elementary physics and calculus is desirable.
113. Climatology. (3) II. Mr. Leighly
 Prerequisite: course 111 or consent of the instructor.
- 121A. Geography of Eastern North America. (3) I. Mr. Rostlund
- 121B. Geography of Western North America. (3) II. Mr. Rostlund
- 122A. Geography of Middle America. (3) I. Mr. Sauer
- 122B. Geography of South America. (3) II. Mr. Sauer
- 123A. Geography of Mediterranean Europe. (3) II. Mr. Glacken
- 123B. Geography of Northern Europe. (3) I. Mr. Rostlund
- 124A. Geography of the Soviet Union. (3) I. Mr. Mirov
- *124B. Economic Geography of the Soviet Union. (2) II. Mr. Mirov
- 125A. Anthropogeography of Southeast Asia. (3) II. Mr. Parsons
- 125B. Geography of China, Japan and Korea. (3) I. Mr. Glacken
127. Geography of Southern Africa. (3) II. Mr. Loeb
130. Geography of the Tropics. (2) I. Mr. Parsons
 An analysis of the resources of the warm and wet lands of the equatorial regions; the economic potentialities of the tropics and the obstacles to their exploitation inherent in the physical and cultural environment.
131. Geography of California. (3) II. Mr. Parsons
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.

* Not to be given, 1953-1954.

151. American Geographic Thought. (2) I. Mr. Leighly
 Prerequisite: three upper division courses in geography.
 Reports and conferences on the objectives, subdivisions, and methods of
 geography by American geographers of the late 19th and the 20th century.
153. Natural Resources and Their Exploitation. (3) II. Mr. Sauer
 Conservative and destructive uses of habitat (occupied area) by cul-
 tures (economic systems) throughout human time, with emphasis on con-
 temporary 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 succes-
 sive geographic dispersal of the domesticated forms.
176. The Relations Between Nature and Culture. (2) I. Mr. Glacken
 A critical survey, from antiquity to the present, of leading theories of
 the effects of the physical environment on culture; the influence of these
 theories on such fields as geography, history and anthropology; contempo-
 rary views of the nature of the physical environment in its relation to
 population and economic potentials.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
 The Staff (Mr. Sauer in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

For facilities for research see the ANNOUNCEMENT OF THE GRADUATE DIVISION,
 NORTHERN SECTION.

201. Seminar in Latin-American Geography. (2) I. Mr. Sauer
- *202. Seminar in Historical Geography. (2) II. ———
203. Seminar in Cultural Geography. (2) II. Mr. Sauer
- *205. Seminar in Physical Geography. (2) I. Mr. Kesseli
- *206. Seminar in Physical Geography. (2) II. Mr. Leighly
 Topic: climatic fluctuation.
- *207. Seminar in History of Geography. (2) I. Mr. Leighly
208. Seminar in Economic Geography. (2) I. Mr. Parsons
- 219A-219B. Research. (1-5; 1-5) Yr.
 The Staff (Mr. Sauer and Mr. Leighly in charge)

GEOLOGICAL SCIENCES

(Department Office, 208 Bacon Hall)

Perry Byerly, Ph.D., *Professor of Seismology (Chairman of the Department
 of Geological Sciences).*

Norman E. A. Hinds, Ph.D., *Professor of Geology.*

Charles Meyer, Ph.D., *Professor of Geology.*

Adolf Pabst, Ph.D., *Professor of Mineralogy.*

Nicholas L. Taliaferro, Ph.D., *Professor of Geology.*

* Not to be given, 1953-1954.

Francis J. Turner, Sc.D., *Professor of Geology.*

² John Verhoogen, M.E., Ph.D., *Professor of Geology.*

Howel Williams, Sc.D., *Professor of Geology.*

George D. Louderback, Ph.D., LL.D., *Professor of Geology, Emeritus.*

¹ Charles M. Gilbert, Ph.D., *Associate Professor of Geology.*

Garniss H. Curtis, Ph.D., *Assistant Professor of Geology.*

Jack F. Evernden, *Assistant Professor of Geology.*

Robert L. Rose, M.A., *Associate in Geology.*

Letters and Science List.—All undergraduate courses in geological sciences are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

MAJOR IN GEOLOGY

Department Major Adviser: Mr. Gilbert.

Preparation for the Major.—Required: Chemistry 1A-1B, Physics 2A-2B; Geology 5 (or 1); Geology 3; Mineralogy 6; Mathematics C. All of these courses must be completed in the lower division to avoid some delay in completion of the major.

Other lower division courses required or recommended before completion of the major are the following. *Required:* Mathematics 3A-3B; Engineering 1A-1B; Chemistry 5 or Metallurgy 2A for those intending to emphasize mineralogy and petrology. *Recommended:* Mathematics 4A-4B; Physics 3A-3B; Paleontology 1 for those intending to emphasize Petroleum or Historical and Stratigraphic Geology; Chemistry 5 or Metallurgy 2A for those intending to emphasize Metalliferous Geology. Some of these courses (particularly Mathematics 3A-3B) should be included in the preparation for the major where possible, but delay in completion of the major does not normally result from postponing them to the upper division provided all other required lower division courses are completed.

In order to facilitate the arrangement of upper division courses in the major, the following recommendations are made regarding the scheduling of prerequisite lower division courses.

(1) Chemistry 1A-1B and Physics 2A-2B should be completed during the freshman year.

(2) Geology 5 (or 1) and 3, and Mineralogy 6 should be completed during the sophomore year; normally Geology 3 and Mineralogy 6 will be taken concurrently during the second semester of that year.

(3) Students intending to enroll in upper division geophysics courses must complete Mathematics 3A-3B in the lower division.

The Major.—Each program must include Geology 102A-102B (4), 103 (4), 118 (4) or 118L (6), and in addition one of the following groups of courses.

I. Emphasis on Mineralogy and Petrology: Geology 104A-104B (6), Mineralogy 103 (3), 107 (3), Chemistry 109 (3). Recommended electives are Geology 106 (3), 108 (2), 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), 108 (2), and one of the following: Geology 116 (2), Mineralogy 103 (3), or Mining 111B (3). Recommended electives are Metallurgy 2A-2B (6), Mineralogy 105 (2), Geology 205A-205B (6), Paleontology 102 (3), 112 (4), Mining 107B (3), 111A (3), Soil Science 101 (3).

III. Emphasis on Petroleum Geology: Geology 111A-111B (6), 116 (2), Paleontology 111 (4), 112 (4). Recommended electives are Paleontology 102 (3), 114 (4), Geology 104A-104B (6), 107 (2), 108 (2), 121 (4), 122A-122B

¹ In residence fall semester only, 1953-1954.

² In residence spring semester only, 1953-1954.

(4), Geography 109 (3), Soil Science 101 (3). Major students selecting this emphasis who intend to do postgraduate work in geology should include Geology 104A-104B in their major programs.

IV. Emphasis on Historical and Stratigraphic Geology: Geology 107 (2), 116 (2), 117 (3), Paleontology 111 (4), 112 (4). Recommended electives are Paleontology 102 (3), 114 (5), Geography 109 (3), Soil Science 101 (3).

V. Emphasis on Geophysics: Geology 116 (2), 121 (4), 122A-122B (4), and Mathematics 110A-110B (4). Recommended electives are Physics 105A-105B (6), Paleontology 102 (3), 112 (4), Geology 106 (3), 108 (2), 111A-111B (6).

The department will certify to the completion of a major program for graduation only on the basis of at least C grades in Geology 102A-102B and 103, and at least a C average in the upper division courses prescribed for the major. Students who do not maintain such an average may be required at any time to withdraw from the departmental major.

In exceptional cases, with consent of the major adviser, Geology 199 (4) may be substituted for Geology 118 or 118L in the major program.

Credits for courses completed in other departments or institutions will not be accepted as equivalent to Geology 102A-102B and 103.

MAJOR IN GEOPHYSICS

Departmental Major Advisers: I: Mr. Byerly; II: Mr. Verhoogen.

Preparation for the Major.—Required: Chemistry 1A; Geology 5 (or 1), 3; Mathematics 3A-3B, 4A-4B; Mineralogy 6; Physics 4A-4B-4C.

The Major.—Required: Geology 102A-102B, 103, 121, 122A-122B; Mathematics 110A-110B; Physics 105A-105B, 110A-110B, 110C.

GEOLOGY

LOWER DIVISION COURSES

1. General Geology: Dynamical and Structural. (3) I. Mr. Hinds
Three lectures and one demonstration and discussion section per week.
Prerequisite: elementary chemistry.
Not open to students who have taken Geology 10.
A survey of the nature and structure of the materials composing the earth and of the processes that shape the earth's surface.
3. General Geology: Historical. (3) II. Mr. Hinds
Three lectures and one demonstration and discussion section per week.
Prerequisite: course 1, 5, or 10.
Origin and geological history of the earth and the evolution of its animal and plant inhabitants.
5. General Geology. (3) II. Mr. Verhoogen
Three lectures and one demonstration section per week.
Prerequisite: Chemistry 1A; high school Physics or Physics 2A-2B (2B may be taken concurrently).
A survey of the natural processes occurring in the earth, with special reference to their physical background.
Recommended for majors in geology and geophysics.
10. Elementary Physiography. (3) II. Mr. Williams
Three lectures and one section meeting per week.
Not open to students who have taken or are taking course 1 or 5.
The earth's surface features and the geologic laws governing their origin and development. Principles underlying the evolution of topography under different climatic conditions.

UPPER DIVISION COURSES

102A-102B. Field Geology. (2-2) Yr.

Mr. Rose, Mr. Evernden, Mr. Meyer, Mr. Taliaferro, Mr. Curtis

102A: Mr. Rose, Mr. Evernden, Mr. Curtis; 102B: Mr. Rose, Mr. Taliaferro, Mr. Meyer.

One lecture per week and field trips all day Saturday.

Prerequisite: course 103 (may be taken concurrently).

Training in the methods of field observation and mapping and in the interpretation of results.

102A. Inquiry into the geology of the Berkeley hills. Eight days in the field; one lecture and one laboratory per week for seven weeks.

102B. Inquiry into the geology of other areas adjacent to the Bay of San Francisco and in the Sierra Nevada. At least ten days in the field.

Reports will be prepared on the results of field work.

Concurrently with the field work, the class meets for lectures, exercises on topographic and geologic maps, and for discussion of methods.

103. Introduction to Petrology. (3 or 4) I and II.

Mr. Taliaferro, Mr. Rose, Mr. Curtis

I: Mr. Taliaferro, Mr. Rose; II: Mr. Curtis.

Two lectures and one or two three-hour laboratory periods per week.

Students in metallurgy, mining, and petroleum engineering will be required to take one afternoon of laboratory work for 3 units of credit. Geology majors and students in the mineral exploration curriculum of the College of Engineering will take two afternoons of laboratory work for 4 units of credit.

Prerequisite: course 5 (or 1), Mineralogy 6 (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 course 104B, course 103.

The optical properties of crystals, followed by determination of minerals and then of rocks by means of the microscope. Approximately one-third of the year is devoted to each of these three topics.

106. Economic Geology, Metalliferous Deposits. (3) I.

Mr. Meyer

Three lectures per week and occasional conference hours.

Prerequisite: course 103 (may be taken concurrently).

*107. Geology of North America. (2) II.

Mr. Hinds

Two lectures per week and occasional conference hours.

Prerequisite: course 3, 102A, and 103.

108. Economic Geology, Nonmetalliferous Deposits. (2) I.

Mr. Curtis

Two lectures per week.

Prerequisite: course 5 (or 1), 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.

* Not to be given, 1953-1954.

- 111A-111B. Petroleum Geology. (3-3) Yr. Mr. Evernden
Prerequisite: course 5 (or 1), Physics 4A (or 2A-2B); course 102A-102B or consent of instructor; Geology 103 is desirable.
The geology of petroleum and of ground water; problems in subsurface structure and correlation.
116. Structural Geology. (2) II. Mr. Taliaferro
Prerequisite: course 5 (or 1), 102A-102B.
Deformation of the earth's crust; mountain growth; folding and faulting and their economic aspects; graphic solution of fault problems.
117. Geomorphology. (3) I. Mr. Hinds
Two lectures per week and one additional conference hour.
Students who have not completed course 102A-102B or who are not taking it concurrently will be admitted only by consent of the instructor.
Nature, evolution, and classification of land forms; use of physiographic methods in elucidating the later geologic history of various regions and in interpreting conditions of the geologic past.
- 118, 118L. Advanced Summer Field Course. Mr. Taliaferro
Prerequisite: course 102A-102B with grade of C or better.
The aim of the course is to develop: (1) facility and accuracy in geological mapping; (2) ability to observe and interpret rocks, structures and physiographic features, and other geological phenomena; and (3) the capacity to execute independently a geological survey and prepare a suitable report. Satisfactory completion of this course satisfies the undergraduate thesis requirements for students whose major is geology.
This work may be taken for credit during two or more summers; however, not more than 6 units of credit so gained will be accepted as part of the undergraduate major. 118 is a six weeks' course for which 4 units will be assigned. 118L is an eight weeks' course for which 6 units will be assigned.
120. Elementary Seismology. (2) I. Mr. Byerly
Prerequisite: Geology 5 (or 1), Physics 2A or equivalent.
A general nonmathematical discussion of earthquakes.
121. Practical Seismometry. (4) II. Mr. Byerly
Three lectures and one three-hour laboratory period per week.
Prerequisite: Physics 2A-2B, Mathematics 4A-4B.
Paths of seismic waves and their relation to the structure of the earth, with emphasis on problems of seismic prospecting; elementary theory of the seismograph; laboratory analysis of seismograms and interpretation of travel-time curves in terms of structure.
- 122A-122B. Principles of Geophysics. (2-2) Yr.† Mr. Verhoogen
Two lectures per week, and occasional conference hours.
Prerequisite: course 5 (or 1), Mathematics 110A-110B (may be taken concurrently), and Physics 4A-4B.
122A. General geophysics.
122B. Applications to geologic problems.
199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. 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.

†In 1953-1954, 122A and 122B will be offered in the spring semester only; 122A and 122B may be taken concurrently.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

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.
- 205A-205B. Laboratory Investigation of Ores. (3-3) Yr. Mr. Meyer
Prerequisite: courses 104A-104B, and 106 or equivalent.
The application of laboratory methods and interpretative procedures to problems in metalliferous geology.
206. Seminar in Geology of Metalliferous Deposits. (2) II. Mr. Curtis
Prerequisite: course 106.
207. Seminar in Volcanology. (2) I. Mr. Williams
The origin and nature of volcanic processes; principal types of activity as exemplified by modern volcanoes; characters and classification of lavas and pyroclastic rocks.
- *208. Physics of Solids. (2) I. Mr. Verhoogen
A survey of physical and chemical properties of solids, with reference to deformation of rocks and to the internal constitution of the earth.
- 209A-209B. Geology of California. (2-2) Yr. Mr. Taliaferro
Prerequisite: course 102A-102B, 103, and a course in historical geology, such as course 3 or 107.
Critical study of literature, with discussion of evidence and scientific method; the main reported facts and theories of the history of sedimentation, volcanism, the major earth movements, and geographical changes in California and bordering areas covered in reports, discussions, and occasional lectures.
- 210A-210B. Advanced Sedimentary Petrography. (3-2) Yr.
Mr. Gilbert, Mr. Turner
One lecture and two three-hour laboratory periods per week in 210A; laboratory only in 210B.
Prerequisite: course 104A.
210A. Mechanical and mineralogical analysis of sediments and sedimentary rocks. Determination of refractive indices and orientation of mineral grains.
210B. Study of sedimentary rocks in thin section; identification of mineral grains.
212. Universal-Stage Petrography. (2) I and II. Mr. Turner
Prerequisite: course 210A or 214A, and consent of instructor.
Use of the universal stage in petrographic determinations and in petrofabric analyses.
213. Seminar in Geomorphology. (2) II. Mr. Hinds
Prerequisite: course 117 or its equivalent.
The topics to be considered will vary from year to year.
- 214A-214B. Advanced Petrology. (2-5; 2-5) Yr. Mr. Turner
Prerequisite: course 104A-104B. Recommended: Mineralogy 105. A reading knowledge of French or German is required of candidates for the Ph.D. degree.

* Not to be given, 1953-1954.

- Discussion of problems of petrogenesis. Microscopic study of suites of rock sections.
Metamorphic and igneous rocks in alternate years; igneous, 1953-1954.
215. Seminar in Sedimentation. (2) II. Mr. Turner
Problems concerning origin and evolution of sedimentary rocks. Content of the course will vary from year to year.
216. Seminar in Structural Geology. (2) II. Mr. Taliaferro
Prerequisite: course 102A-102B, 103, 116, and a course in historical geology.
Folding and faulting, growth of mountains: a study of special topics in structural geology. Reports and discussions, with occasional lectures.
217. Advanced Seismometry. (2) II. Mr. Byerly
The general mathematical theory of the seismograph; discussion of the problems of modern seismometry and of recent results.
- 218A-218B. Seminar in Seismology. (2-2) Yr. Mr. Byerly, Mr. Evernden
218A: Mr. Byerly; 218B: Mr. Evernden.
Critical study of original literature relating to seismological problems. The content will vary from year to year.
220. Research. (1-5) I and II. The Staff (Mr. Williams in charge)
298. Directed Studies. (2) I and II. The Staff (Mr. Turner in charge)
Prerequisite: graduate standing.
Selected readings in geology and geophysics.

MINERALOGY

LOWER DIVISION COURSE

6. Introduction to Mineralogy. (4) I and II.
(Formerly numbered 4A-4B.) Mr. Gilbert, Mr. Pabst, Mr. Rose
I: Mr. Gilbert; II: Mr. Pabst, Mr. Rose.
Two lectures and two three-hour laboratory periods per week.
Prerequisite: Chemistry 1A and Physics 2A or equivalent.
Determination of common rock-forming minerals, origin, relationships, and properties; study of simple crystals; use of blowpipe and chemical tests for minerals.

UPPER DIVISION COURSES

103. Mineralogy. (3) II. Mr. Pabst
Prerequisite: Mineralogy 6 (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: course 103 and Geology 103.
Lectures on the occurrence, association and habit of minerals.
107. Crystallography. (3) I. Mr. Pabst
Prerequisite: Mathematics 3A-3B and consent of instructor.
Lectures on geometrical crystallography including a discussion of space groups, Hermann-Mauguin symbols, the reciprocal lattice and the use of the stereographic and gnomonic projections.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Research. (See Geology 220.)

232. Goniometry and Crystal Drawing. (2) I. Mr. Pabst
 Prerequisite: consent of instructor.
 Mineralogy 107 is recommended and may be taken concurrently.
 Lectures and laboratory work on the measurement and projection of crystals.
234. Identification of Crystalline Materials. (2) II. Mr. Pabst
 Prerequisite: consent of instructor.
 Principles and practice of the identification of crystalline materials by various methods with emphasis on the use of powder X-ray diffraction methods.

GERMAN

(Department Office, 2323 Dwinelle Hall)

†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.*

Robert T. Clark, Jr., Ph.D., *Professor of German.*

C. Grant Loomis, Ph.D., *Professor of German.*

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.*

‡Madison S. Beeler, Ph.D., *Associate Professor of German.*

*Erwin G. Gudde, Ph.D., *Associate Professor of German.*

Philip Motley Palmer, Ph.D., *Associate Professor of German.*

Franz Schneider, Ph.D., *Associate Professor of German.*

Marianne Bonwit, Ph.D., *Assistant Professor of German.*

Peter Bruning, Ph.D., *Assistant Professor of Dutch and German.*

Andrew O. Jászi, Ph.D., *Assistant Professor of German.*

‡Joseph Mileck, Ph.D., *Assistant Professor of German.*

Edith J. Lewy, A.B., *Associate in German.*

Eugene E. Reed, Ph.D., *Instructor in German.*

Letters and Science List.—All undergraduate courses in German are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Jászi.

Preparation for the Major.—German 1, 2, 3, 4, or their equivalents, completed satisfactorily.

The Major.—Requirement: 24 units in upper division courses, including one full year's course in composition and at least 6 units made up from the senior courses 107, 114, 118A, 118B, 124, and 135A. Six of the 24 units may be re-

† Sabbatical leave in residence, fall semester, 1953-1954.

‡ Sabbatical leave in residence, spring semester, 1953-1954.

¹ In residence fall semester only, 1953-1954.

² In residence spring semester only, 1953-1954.

lated work in other departments. Attention is also directed to the courses listed under "Foreign Literature in Translation," page 162. 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. Mileck in charge
12. Elementary German. Intensive Course. (8) I and II. ———, Mr. Gudde
Two hours daily, four times per week.
This course is equivalent to courses 1 and 2.
2. Elementary German (continuation of 1). (4) I and II. Mr. Mileck in charge
Prerequisite: course 1 or two years of high school German.
3. Intermediate German. (4) I and II. Miss Bonwit in charge
Prerequisite: course 2 or three years of high school German.
Section 4 is for students primarily interested in conversational German.
- 3A. German Poetry. (1) I and II. ———, Miss Lewy
Prerequisite: German 2, or three years of high school German.
4. Intermediate German. (4) I and II. Miss Bonwit in charge
Prerequisite: course 3 or four years of high school German.
- 1G. German for Graduate Students. (No credit) I and II. Miss Lewy in charge
A course designed to prepare students for the graduate reading examinations. Sections will be offered in the humanities and the natural sciences.
- 3S. Scientific German. (3) I and II. Mr. Bruning 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. Bruning, Mr. Beeler
Prerequisite: course 3S or 3 or equivalent.
- 4M. Medical German. (3) II. ———
Prerequisite: course 3 or 3S or equivalent.
39. Great Writers in German Literature. (2)
Any one of these courses is open to students in all departments of the University, major students in German excepted. No knowledge of German required.
 - 39A. Medieval Period (2) I, Mr. Taylor.
 - 39B. Eighteenth Century. (2) II, Miss Bonwit.
 - 39C. Nineteenth Century. (2) I, Mr. Clark
 - 39D. Twentieth Century. (2) II, Mr. Loomis.

UPPER DIVISION COURSES

Prerequisite: 16 units of lower division German courses.

100. Introduction to Modern German Literature. (3) I and II.
Mr. Wolff, Mr. Loomis
104. Dramas of the Nineteenth Century. (3) II. Mr. Bell
106. Schiller's Dramas. (3) I. Mr. Brewer
- *107. Schiller's Poetry, Aesthetic and Historical Writings. (3) II.
Mr. Brewer
Prerequisite: 6 units of upper division courses in German literature.
108. Introduction to Goethe. (3) I. Miss Bonwit
Götz von Berlichingen, Urfaust, Werther.
109. Goethe's Verse Dramas; *Tasso, Iphigenie, Faust*, Part I. (3) II.
Mr. Clark
110. The German Ballad and Lyric Poetry except Goethe. (1) I. Mr. Loomis
111. Goethe's Poems. (1) II. Mr. Gudde
- *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) I. ———
Prerequisite: 6 units from any of the above-listed upper division courses.
- *115. Nietzsche. (3) I. Mr. Wolff
Prerequisite: a reading knowledge of German.
Lectures in English. Interpretations, collateral reading and reports.
- 118A. History of German Literature in the Middle Ages. (3) I. Mr. Palmer
Prerequisite: 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.
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.
Mr. Jászi, Miss Bonwit
Prerequisite: grade C or higher in course 130A-130B.

* Not to be given, 1953-1954.

- 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. Jászi in charge

DUTCH

1. Elementary Dutch. Beginners' Course. (3) I. Mr. Bruning
2. Elementary Dutch (continuation of 1). (3) II. Mr. Bruning

GERMAN

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

Prerequisite: for the literary courses, course 118A 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.
- *203. Studies in Middle High German Literature. (2) I. Mr. Bell
Prerequisite: course 135A.
- *204. The Poetry of the Elder Edda. (3) II. Mr. Brodeur
Prerequisite: course 280.
Old Norse mythological and legendary poems read in the original.
- *205. German Literature During the Renaissance and Reformation. (3) II.
Mr. Taylor
206. German Literature During the Seventeenth Century. (2) I. Mr. Loomis
214. Lessing and His Time. (2) I. Mr. Clark
- *220. Goethe to the Period of the Italian Journey. (2) I. Mr. Wolff
221. Goethe from the Period of the Italian Journey to His Death. (2) II.
Mr. Wolff
- *228. Early German Romanticism: 1795-1810. (3) I. Mr. Brewer
- *229. Kleist, Büchner, Grabbe. (2) I. Mr. Wolff
- *230. Grillparzer. (2) I. _____

* Not to be given, 1958-1954.

238. German Realism, 1850-1900. (2) II. Miss Bonwit
- *239. Interpretation and Criticism of German Poetry. (2) II. Mr. Jászi
249. Seminar in German Literature. (2 or 3) II.
The Staff (Mr. Brewer in charge)
- The topic for the spring semester: Herder: Essays and Treatises on the Creative Personality (2), Mr. Clark.
298. Special Study for Graduate Students. (1-4) I and II.
Mr. Clark in charge

Germanic Linguistics

For the courses in English philology, see the Department of English, page 148.

260. Germanic Linguistics. (3) I. Mr. Beeler
Prerequisite: some acquaintance with at least two of the older Germanic languages.
Phonology, morphology, and lexicography of the Germanic languages; the relationship of the Germanic languages to one another; the reconstruction of Proto-Germanic; Proto-Germanic and Indo-European.
262. History of the German Language. (3) I. Mr. Palmer
- *265. Gothic. (3) II. Mr. Beeler
275. Old High German. (3) II. Mr. Palmer
- *280. Old Icelandic. (3) I. Mr. Beeler
- *281. The Icelandic Saga. (2) II. Mr. Beeler
Prerequisite: course 280.
One of the longer Icelandic sagas will normally be read in this course.
290. Seminar in Germanic Linguistics. (2 or 3) II. Mr. Palmer
The topic for the spring semester: Old Saxon.

RELATED COURSES

Romanticism in Western Europe (Comparative Literature 121).
The Symbolist Movement in European Literature (Comparative Literature 201A-201B).

GREEK

For courses in the Greek language and literature, see under Department of Classics, page 70.

HISTORY

(Department Office, 3303 Dwinelle Hall)

Woodbridge Bingham, Ph.D., *Professor of Far Eastern History and Director of the Institute of East Asiatic Studies.*

†Carl Bridenbaugh, Ph.D., *Margaret Byrne Professor of United States History.*

²George H. Guttridge, M.A. (Cantab.), *Professor of English History.*

George P. Hammond, Ph.D., *Professor of History and Director of the Bancroft Library.*

* Not to be given, 1953-1954.

† Sabbatical leave in residence, fall semester, 1953-1954.

¹ In residence fall semester only, 1953-1954.

- Lawrence A. Harper, J.D., Ph.D., *Professor of American History.*
 John D. Hicks, Ph.D., *A. F. and May T. Morrison Professor of History.*
 Robert J. Kerner, Ph.D., LL.D., Litt.D., *Sather Professor of History and Director of the Institute of Slavic Studies.*
 James F. King, Ph.D., *Professor of History (Chairman of the Department).*
 Lawrence Kinnaird, Ph.D., *Professor of History.*
 Franklin C. Palm, Ph.D., *Professor of Modern European History.*
 Engel Sluiter, Ph.D., *Professor of History.*
 †Raymond J. Sontag, Ph.D., *Sidney Hellman Ehrman Professor of European History.*
 Kenneth M. Stampp, Ph.D., *Professor of History.*
 John J. Van Nostrand, Ph.D., LL.D., *Professor of Ancient History.*
 ‡Walton E. Bean, Ph.D., *Associate Professor of History.*
 *Delmer M. Brown, Ph.D., *Associate Professor of History.*
 ¶George V. Lantzeff, Ph.D., *Associate Professor of History.*
 Henry F. May, Ph.D., *Associate Professor of History.*
 Paul B. Schaeffer, Ph.D., *Associate Professor of European History.*
 *William N. Davis, Ph.D., *Assistant Professor of History.*
 Gordon Griffiths, Ph.D., *Assistant Professor of History.*
 Reuben H. Gross, Jr., D.Phil. (Oxon.), *Assistant Professor of History.*
 David L. Hoggan, Ph.D., *Acting Assistant Professor of History.*
 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.*
 Robert J. Brentano, D.Phil. (Oxon.), *Instructor in History.*



- George H. Kerr, M.A., *Lecturer in History.*
 Richard J. Miller, Ph.D., *Lecturer in History.*

Introductory Courses.—Courses 4A–4B and 8A–8B are open to all students, but 4A should be taken preferably before 8A by freshmen; course 17A–17B is open to all students above the freshman year; the A part of any of the introductory courses should ordinarily precede the B part.

Foreign Language in the Lower Division.—All students who intend to take upper division courses in history are advised to acquire a reading knowledge of at least one of the following languages before they reach their junior year: French, German, Italian, Latin, Spanish.

Letters and Science List.—All undergraduate courses in history are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

The American History requirement may be satisfied by completing any one of the following courses in history: 8B, 17A, 17B, 167A, 167B, 170A, 170B, 171A, 171B, 172A, 172B, 173A, 173B, 173C, 174A, 174B, 175A, 175B, 176A, 176B, 177A, 177B, 187A, 187B.

Department Major Advisers: Mr. Schaeffer, Chairman; Mr. Davis, Mr. Gross, Mr. Levenson.

† Sabbatical leave in residence, fall semester, 1953–1954.

‡ Sabbatical leave in residence, 1953–1954.

¶ Sabbatical leave in residence, spring semester, 1953–1954.

|| Absent on leave, fall semester; sabbatical leave in residence, spring semester, 1953–1954.

* In residence spring semester only, 1953–1954.

Preparation for the Major.—Required: History 4A–4B; and 8A–8B or 17A–17B (according to the intended field of concentration); and either Economics 1A or Geography 1.

The Major.—Students majoring in history must complete 24 upper division units in history, including:

- (a) *In the junior year:* History 101 and at least one year course of broad scope, preparatory to more specialized work in the same field (Europe, Western Hemisphere, Far East).
- (b) *In the junior or senior year:* a second year course in a different field from that chosen under (a) above.
- (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 the CIRCULAR OF INFORMATION, BERKELEY, concerning Honors.

Teacher-Training Curricula.—The curriculum for the Certificate of Completion (with a teaching major in social studies) differs from that of the undergraduate major in history both in the list of prescribed courses and in the requirement of at least 1.75 grade points per unit. For further information concerning the teaching-training curriculum, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, and consult the graduate adviser.

Higher Degrees.—Students planning to work toward the degrees of M.A. and Ph.D. should consult the ANNOUNCEMENT OF THE GRADUATE DIVISION and the Graduate Division bulletin, ANNOUNCEMENT IN THE SOCIAL SCIENCES, and confer with the graduate adviser.

LOWER DIVISION COURSES

In courses 4A–4B, 8A–8B and 17A–17B weekly sections are organized to give supplementary instruction in historical geography, map work, bibliography, and methods of historical study.

4A–4B. History of Western Europe. (3–3) Yr. Beginning each semester.

Mr. Jelavich, Mr. Palm, Mr. Griffiths

Course 4A is prerequisite to 4B for freshmen.

8A–8B. History of the Americas. (3–3) Yr.

Mr. Sluiter

17A–17B. History of the United States. (3–3) Yr. Beginning each semester.

Mr. Hicks, Mr. May, Mr. Rappaport, Mr. Stampf

Prerequisite: sophomore standing. A student may not receive credit for both History 17A–17B and History 171A–171B.

UPPER DIVISION COURSES

101. Introduction to Historical Method and Bibliography. (3) I and II.

Two lectures per week and conference hours. Mr. Brentano

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. ———
- *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. (3-3) Yr. Mr. Griffiths
 142A. Renaissance.
 142B. Risorgimento.

* Not to be given, 1953-1954.

- 143A-143B. History of Germany. (3-3) Yr. Mr. Hoggan
Prerequisite: course 4A-4B or 17A-17B.
143A takes up the history of the Holy Roman Empire from the 9th century to 1806, and 143B continues with a treatment of Germany in the 19th and 20th centuries.
- 144A-144B. European Diplomatic History. (3-3) Yr.
144A. 1848 to 1914, Mr. Hoggan. Mr. Hoggan, Mr. Sontag
144B. 1914 to the present, Mr. Sontag.
145. The Revolutionary Era in Europe. (3) I. Mr. Palm
146. Europe Since 1870. (3) II. Mr. Palm
- *148. Recent World History. (3) Mr. Kerner
The historical background since the First World War and the current situation in world politics and world economics.
- 149A*-149B. The Diplomatic History of Europe from 1648 to 1848. (2-2) Yr. Mr. Hoggan
149A will present the entire field of European diplomatic relations from 1648 to 1740, and 149B will continue this presentation from 1740 to 1848.
150. Medieval England. (3) I. Mr. Brentano
- 151A-151B. History of England, from 1485 to the Present. (3-3) Yr.
151A. 1485-1740, Mr. Guttridge. Mr. Guttridge, Mr. Gross
151B. 1740 to the present, Mr. Gross.
- 152A-*152B. Constitutional History of England. (3-3) Yr. Mr. Brentano
Prerequisite: course 150, 151A-151B or 121A-121B.
152A: to 1485, II; 152B: 1485 to present.
- *154. England and the American Colonies to 1783. (2) I. Mr. Guttridge
Prerequisite: course 151A or equivalent.
- 155A-155B. The British Commonwealth and Empire. (3-3) Yr. Mr. Gross
155A: To 1870.
155B: Since 1870.
Prerequisite: course 151B or equivalent.
156. History of Canada. (3) I. Mr. Gross
History of Canada from the early European settlements to its present status as a member nation of the Commonwealth. Emphasis will be placed both on internal developments and on the imperial connection with Great Britain.
157. Burke and His Age, 1750-1800. (2) I. Mr. Guttridge
Reading and discussion.
Prerequisite: course 151A-151B or equivalent.
- *159. Recent History of Great Britain, 1900 to the Present. (3) I. Mr. Gross
- 160A-160B. History of Spain and Portugal. (3-3) Yr. Mr. Van Nostrand
- 161A-161B. Hispanic-American History. (3-3) Yr. Mr. Sluiter, Mr. King
161A. The Colonies: Mr. Sluiter.
161B. Since Independence: Mr. King.

* Not to be given, 1953-1954.

162. History of the Caribbean Area. (3) I. Mr. King
Caribbean history from the eighteenth century to the present. The rise and decline of the sugar colonies and of slavery, revolution and independence, international relations, and evolving economic, social and political patterns in colonies and free areas all receive attention.
163. History of Brazil. (3) II. Mr. Sluiter
- 166A-166B. History of Mexico. (2-2) Yr. Mr. Hammond
166A. Colonial Period.
166B. National Period.
- 167A-*167B. The Diplomatic History of the United States. (3-3) Yr.
167A. 1776-1880. Mr. Rappaport
167B. 1880 to the present.
- *168. History of Inter-American Relations. (3) I. Mr. King
History of the relations of the Hispanic-American nations among themselves and with the United States since independence. Emphasis will be placed on the Pan-American movement and the development of the organization of American States.
- 170A-*170B. American Colonial History. (3-3) Yr. Mr. Bridenbaugh
170A. The American Colonies to 1763; II.
170B. The American Revolution, 1763-1789.
- 171A-171B. History of the United States. (3-3) Yr. Mr. Harper
171A. To the end of Reconstruction.
171B. From the end of Reconstruction to the present.
A student may not receive credit for both History 17A-17B and History 171A-171B.
- 172A-172B. Constitutional History of the United States. (2-2) Yr. Mr. Harper
Prerequisite: course 17A-17B or consent of 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. Mr. Stamp
*173A. The Old South. (3)
173B. The Era of the Civil War, 1850-1865. (3) I.
173C. Reconstruction and the New Nation, 1865-1900. (3) II.
173A is not prerequisite to 173B; 173B is not prerequisite to 173C.
- 174A-174B. Recent History of the United States. (3-3) Yr. Mr. Hicks
174A. 1900-1925.
174B. 1925 to the present.
- 175A-175B. Intellectual History of the United States. (3-3) Yr. Mr. May
175A. To 1865.
175B. 1865 to the present.
- 176A-*176B. Social History of the United States. (3-3) Yr.
176A. 1763-1865; II. Mr. Bridenbaugh
176B. 1865 to the present.

* Not to be given, 1953-1954.

- *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
 181A. The Colonial Period; 181B. The North American Nations.
- *183. Economic Exploitation of Colonial America. (3) II. Mr. Sluiter
- 187A*-187B. The West in United States History. (2-2) Yr. Mr. Davis
- *188. The Opening of the Pacific, 1513-1800. (3) II. Mr. Sluiter
 A history of European penetration, occupation, rivalry, and influence
 in the Pacific Area from the sixteenth through the eighteenth centuries.
- 189A-189B. History of California. (2-2) Yr. Mr. Kinnaird
 189A. Spanish and Mexican Period.
 189B. American Period.
- 190A-190B. Introduction to the History of Asia. (3-3) Yr. Mr. Bingham
 190A. To 1600.
 190B. Since 1600.
 Survey of political and cultural history of major countries of Asia from
 ancient to modern times. Development of civilizations of China, India, Iran,
 Arabia, Turkey, Mongolia, Japan, Southeast Asia. Relations with western
 Europe, Russia, and America.
- 191A-191B. Japan and Her Colonies. (2-2) Yr. Mr. Kerr
 The history of Japanese administration in Okinawa, Formosa, and
 Korea before World War II.
- *192A-192B. Far Eastern Diplomatic History. (3-3) Yr. ———
- *193A-193B. The Middle Periods of Chinese History, 600-1600. (2-2) Yr.
 193A. 600-960; 193B. 960-1600. Mr. Bingham
 Prerequisite: an elementary knowledge of Chinese history.
 A study of Chinese life from the Sui-T'ang period to the end of the
 Ming.
- 194A-194B. History of Modern China. (3-3) Yr. Mr. Levenson
 194A. History of China to the fall of the Ming Dynasty (17th Cen-
 tury).
 194B. History of China since the fall of the Ming Dynasty. Emphasis
 will be placed on the interplay of political, economic, and cultural forces in
 "traditional" and "transitional" China, the Chinese background of con-
 temporary Chinese conflict.
- 194C. Intellectual History of Modern China. (2) II. Mr. Levenson
 Prerequisite: an elementary knowledge of Chinese history.
 Traditionalism and iconoclasm in China since its 16th century contact
 with the West. Attention will be focused on the distinction between the
 study of intellectual history and the study of abstract ideas, and on the
 connection between intellectual change and social change. Analysis will be
 made of the links between formal philosophy, canons of esthetic taste and
 popular points of view, and of the modern Chinese trends in these areas.
- 195A-195B. History of Japan. (3-3) Yr. Mr. Kerr
 195A. Period of Chinese Influence.
 195B. Period of Western Influence.

* Not to be given, 1953-1954.

- *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.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201. Advanced Studies in the Sources and General Literature of the Several Fields of History. (3) I and II. The Staff
I. Chinese History, Mr. Levenson; Latin American History, Mr. Sluiter; United States History, Mr. Bridenbaugh, Mr. Hicks; English History, Mr. Gross.
II. Latin American History, Mr. King; United States History, Mr. Davis, Mr. Stampp.
202. Historical Method and Bibliography. (3) I and II. Mr. Van Nostrand
Designed especially for candidates for higher degrees in history. Stress is laid on practical exercises.
205. Historical Auxiliaries to Medieval Studies. (3) Mr. Brentano
- *211A-211B. Seminar in Ancient History. (3-3) Yr. Mr. Van Nostrand
- 221A-221B. Seminar in Medieval History. (3-3) Yr. Mr. Schaeffer
- 225A-*225B. Seminar in Early Medieval History and 15th-Century England. (3-3) Yr. Mr. Brentano
- 231A-231B. Seminar in Early Modern European History. (3-3) Yr. Mr. Griffiths
- 235A*-235B. Seminar in Russian History. (3-3) Yr. Mr. Lantzeff
- 236A-236B. Seminar in Modern Slavic History. (3-3) Yr. Mr. Kerner
- 239A-239B. Seminar in Central and Southeastern Europe. (3-3) Yr. Mr. Jelavich
- 241A-241B. Seminar in Modern European History. (3-3) Yr. Mr. Palm
- 243A-243B. Seminar in Modern European History. (3-3) Yr. Mr. Hoggan
- 244A-244B. Seminar in Modern European History. (3-3) Yr. Mr. Sontag
- 251A-251B. Seminar in English History. (3-3) Yr. Mr. Guttridge, Mr. Gross
- *260A-260B. Seminar in the History of Spain. (3-3) Yr. Mr. Van Nostrand
Prerequisite: course 160A-160B, a reading knowledge of Spanish, and French or German.
- 261A-*261B. Seminar in Hispanic-American History. (3-3) Yr. Mr. King

* Not to be given, 1953-1954.

- *266A-266B. Seminar in Mexican History. (3-3) Yr. Mr. Hammond
- 267A-*267B. Seminar in the Diplomatic History of the United States.
(3-3) Yr. Mr. Rappaport
Prerequisite: course 167A-167B.
- 271*-271B. Seminar in the History of the American West. (3-3) Yr.
Mr. Davis
- 272A-272B. Seminar in the Colonial Period of United States History.
(3-3) Yr. Mr. Harper
- 273A-273B. Seminar in the History of the Old South, the Civil War and
Reconstruction. (3-3) Yr. Mr. Stampp
- 274A-274B. Seminar in the Recent History of the United States. (3-3) Yr.
Mr. Hicks
- 275A-275B. Seminar in the Intellectual History of the United States.
(3-3) Yr. Mr. May
- 276A*-276B. Seminar in American Social History, 1700-1900. (3-3) Yr.
Mr. Bridenbaugh
- 277A-277B. Seminar in the Early National Period of United States History.
(3-3) Yr. Mr. Bean
- 281A-281B. Seminar in North American History. (3-3) Yr. Mr. Kinnaird
- 283*-283B. Seminar in Hispanic-American History. (3-3) Yr. Mr. Sluiter
- 291A-291B. Seminar in the History of the Far East. (3-3) Yr.
Mr. Bingham
- 294A-294B. Seminar in the History of Modern China. (3-3) Yr.
Mr. Levenson
- 295A-295B. Seminar in Japanese History. (3-3) Yr. Mr. Kerr
298. Directed Research. (2-4) I and II. The Staff

HOME ECONOMICS

(Department Office, 1581 Life Sciences Building)

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 (Barbara Kennedy Johnson), Ph.D., *Assistant Professor of Home Economics.*

Lotte Arnrich, Ph.D., *Instructor in Home Economics.*

* Not to be given, 1953-1954.

² In residence spring semester only. 1953-1954.

Mary S. Spencer, Ph.D., *Instructor in Home Economics.*
 Clark E. Vincent, Ph.D., *Instructor in Family Sociology.*
 Agnes C. McClelland, M.A., *Associate in Home Economics.*
 Dorothy M. Sidwell, M.S., *Associate in Home Economics.*



Barbara I. Keane, M.S., *Lecturer in Home Economics.*
 Evelyn Peters, M.A., *Lecturer in Home Economics.*

Curriculum in Home Economics.—The requirements for this curriculum offered in the College of Agriculture are stated in the CIRCULAR OF INFORMATION, BERKELEY.

LOWER DIVISION COURSES

- 1A-1B. Experimental Food Study. (3-3) Yr. Beginning each semester.
 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) II. Miss Jones
 Lectures and laboratory.
 Prerequisite: Chemistry 1A and 8.
 Study of plant, animal, and synthetic fibers used in textiles and of the finished textile materials.
7. Elementary Clothing Study. (3) I and II. Miss McClelland, Mrs. Keane
 Lecture and laboratory.
 Prerequisite: Decorative Art 6A-6B.
 Practical and cultural problems in modern garment design and construction.
10. Elementary Nutrition. (2) I and II. Mrs. Cook
 A nontechnical presentation of the modern knowledge of foods and nutrition.
11. Principles of Food Preparation. (2) I. Mrs. Spencer
 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, Mr. Vincent
 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).

* Not to be given, 1953-1954.

Discussion and field observation of food production and distribution; their relation to food consumption and expenditures. Food buying for families and institutions; factors affecting price and quality; food legislation.

- 101A. Food Analysis. (3) I. Miss Kennedy
 Lecture and laboratory.
 Prerequisite: course 1A-1B 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.
- *108. Introduction to Research in Food Preparation and Control. (2) II. 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
 Prerequisite: course 101A.
 A proseminar on late research in the chemistry of food composition, preparation, and control.

Nutrition and Dietetics

111. Nutrition. (3) I. Mrs. Cook
 Prerequisite: Chemistry 1A or high school chemistry and Physiology 1.
 A brief study of the essential nutrients and their functions in 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
 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
 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
 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
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) I. Mrs. Morgan, Miss Arnrich
Prerequisite: course 118A-118B, or Biochemistry 102 and 104. (May be taken concurrently with 118A.)

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.

Institution Economics

121. Institution Food Study. (4) I. Miss Gillum
Lectures, field or laboratory work, and three additional hours to be arranged.

Prerequisite: courses 1A-1B.

The principles and problems involved in the preparation and service of food in institutions.

122. Institution Organization and Management. (4) II. Miss Gillum
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
Supervised practice in administrative problems of the hospital dietetic service carried on during residence in Berkeley, and open only to selected graduate students.

427. Hospital Dietetics. (6) I and II. Miss Gillum
Conferences and supervised practice in the dietetics department of the University of California Hospital and clinics.
Open only to selected graduate students.

Child Development and Family Relationships

132. Child Psychology. (3) 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, Mrs. Sidwell
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, Miss Peters, Mrs. Sidwell
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.

* Not to be given, 1953-1954.

137. Marriage and Family Relationships. (3) I and II. Mr. Landis
A survey of the most recent information on courtship, mate selection, husband-wife adjustments, and parent-child relationships.
138. The Contemporary American Family. (3) I and II. Mr. Vincent
Prerequisite: 6 units of Psychology and/or 6 units of Sociology and Social Institutions.
An examination of the results of the impact of modern culture upon the family with emphasis upon family types, member relationships, family dynamics in relation to personality, social change and social values.
139. The Sociology of Child Development. (3) I. Mr. Vincent
An analysis of various social factors, social groupings, and social contexts in relation to the social development of the child.

PROFESSIONAL COURSE

435. Nursery School Administration. (3) II. Miss Landreth
Lectures twice a week, supervised practice in nursery schools, and related field work, six hours per week.
Open only to 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 finance—money income, household production, planning expenditures, credit, savings, investments, financing home ownership.

*Home Furnishing****152. Home Furnishing. (3) II.**

Prerequisite: Decorative Art 6A-6B, 130A-130B (130B may be taken concurrently)

A nonprofessional course designed to develop discrimination in values. A consideration of materials and their use involved in the furnishing of the home, and an analysis of current trends and materials available.

*Clothing and Textiles***160. Textiles. (3) II.**

Miss Jones

Lecture and laboratory.

Prerequisite: course 6.

Technical analyses and evaluations of textile fibers and fabrics.

162. Clothing Economics. (3) I.

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. Apparel Design and Construction. (3) I and II.

Miss McClelland

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

Lecture and laboratory.

Prerequisite: course 7.

The design, draping, and construction of costumes based on the principles of design and color theory; past and current fashion trends and fashion merchandising methods.

SPECIAL STUDY COURSE APPLYING TO ALL MAJORS

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

The Staff (Mrs. Morgan in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

202. Seminar in Foods and Nutrition. (2) I.

Miss Okey

***212. Seminar in Nutrition. (2) II.**

Mrs. Morgan

215. Seminar in Disorders of Nutrition. (2) I.

Miss Gillum

Prerequisite: course 115 or consent of instructor.

218. Research in Food and Nutrition. (2-6) I and II.

The Staff (Mrs. Morgan in charge)

222. Seminar in Institutional Organization and Management. (2) II.

Miss Gillum

Prerequisite: courses 121 and 122 or consent of instructor.

* Not to be given, 1953-1954.

- *230. Seminar in Nutrition of Development. (2) II. 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 to 4) I and II. Mr. Landis
Techniques of research and evaluation of research in family sociology.
Opportunity to engage in individual or group research projects.
238. Research in Home Economics. (2-6) I and II.
The Staff (Mrs. Morgan in charge)
239. Seminar in Sociological Aspects of Marriage and Family Counseling.
(2) II. Mr. Vincent
Prerequisite: consent of instructor.
A survey and critical analysis of the field of marriage and family counseling with primary emphasis upon social factors and sociological concepts, as differentiated from psychiatric and clinical concepts and levels of analysis.
242. Seminar in Family Economics. (2) II. Miss Coles
262. Seminar in Textiles. (2) II. Miss Jones
Prerequisite: graduate standing in Textiles and Clothing.

HORTICULTURE

(GIVEN AT RIVERSIDE)

GRADUATE COURSE

- 201A-201B. Research in Subtropical Horticulture. (1-6; 1-6) Yr.
Mr. Batchelor

ITALIAN

(Department Office, 4226 Dwinelle Hall)

Michele De Filippis, Ph.D., *Professor of Italian (Chairman of the Department)*.

Giovanni Cecchetti, Dottore in Lettere, *Assistant Professor of Italian*.

Aldo Scaglione, Dottore in Lettere, *Assistant Professor of Italian*.

Josephine P. Proskauer, *Dottore in Lettere, Associate in Italian*.

Letters and Science List.—All undergraduate courses in Italian are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. De Filippis.

Preparation for the Major.—Required: 16 units of lower division courses or four years of high school Italian, or other equivalent to be tested by examination. Recommended: a reading knowledge of Latin.

The Major.—24 units of upper division courses of which at least 18 must be in Italian; 6 units must be chosen from courses in French, Spanish, Portuguese, or Classics.

The department recommends as a supplementary choice among the free electives: (a) history of the country or countries most intimately connected with the major, (b) related courses in other literatures, (c) the history of philosophy, (d) German, (e) Latin, (f) Greek.

* Not to be given, 1953-1954.

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.

SPECIAL LOWER DIVISION COURSE FOR GRADUATE STUDENTS

- 1G. Italian for Graduate Students. (No credit) I and II. Mr. De Filippis
Preparation for graduate reading examinations.

UPPER DIVISION COURSES

Sixteen units of lower division courses in Italian are required for admission to any upper division course. Only those students who pronounce correctly and read fluently will be admitted to upper division courses. Students who transfer from other institutions may be tested by examination.

- *100. Survey of Modern Drama from Goldoni to the Present. (3) II.
Mr. Cecchetti
- 101A-101B. Advanced Grammar, Composition, and Conversation. (3-3) Yr.
Mr. Cecchetti
- 103A-103B. Survey of Italian Literature. (3-3) Yr. Mr. De Filippis
A study of standard authors in prose and verse; lectures in Italian and reports on assigned themes.
- 104A-104B. Italian Literature of the Nineteenth Century. (3-3) Yr.
Mr. Cecchetti
Reading of texts, with a special study of literary technique. Lectures in Italian.
- *105. Contemporary Italian Literature. (3) I. Mr. Cecchetti
An historical and critical survey of all important movements and figures in Italian writing since 1910.
- 109A-109B. Dante's *Divina Commedia*. (3-3) Yr. Mr. Scaglione
Prerequisite: 6 units of upper division work in Italian or equivalent.
- 150A-150B. Dante's *Divine Comedy* in English Translation. (2-2) Yr.
Mr. Scaglione
Designed for upper division students wishing the cultural background provided by such a masterpiece as Dante's, and for graduate students whose major field is not in Romance languages. Enrollment is limited to students who have already completed some upper division work or who present other evidence of adequate preparation. No knowledge of Italian required. This course will not be accepted toward the major in Italian. Course 150A is prerequisite to 150B.

* Not to be given, 1953-1954.

199. Special Study for Advanced Undergraduates. (1-3) I and II.
Reading course with a short thesis. Mr. Cecchetti

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- *201A-201B. Italian Philology. (2-2) Yr. _____
- *206A-206B. Problems in Italian Grammar. (2-2) Yr. Mr. De Filippis
A study of difficult points in grammar and syntax. Research and reports.
- 207A-207B. Problems in Italian Literature. Seminar. (2-2) Yr.
Mr. De Filippis
The period (Trecento or Quattrocento, etc.) or the special genre to be studied will vary; the purpose of the course is training in methods of literary research.
229. Special Study for Graduates. (1-4) I and II. Mr. De Filippis

RELATED COURSE

The Renaissance in the literatures of Italy, France and England (Comparative Literature 151A-151B).

JOURNALISM

(Department Office, 5205 Dwinelle Hall)

Robert W. Desmond, Ph.D., *Professor of Journalism (Chairman of the Department)*.

Philip F. Griffin, M.A., *Associate Professor of Journalism*.

Albert G. Pickerell, Ph.D., *Associate Professor of Journalism*.

Marvin Rosenberg, Ph.D., *Assistant Professor of Journalism*.

Alfred E. Tomlinson, A.B., *Associate in Journalism*.



William W. Greer, B.S., *Lecturer in Journalism for the spring semester*.

Lloyd E. Reeve, *Lecturer in Journalism*.

George W. Seidl, A.B., *Lecturer in Journalism*.

Letters and Science List.—Courses 120A-120B, 140, 141, 190, 195, and 199 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Desmond, Mr. Griffin, 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; Recommended: course 38.

The Major.—Required: courses 120A-120B, 140, 141, and 9 additional units selected as follows: courses 131 and 184 and 3 additional units; or courses 152 and 153 and 3 additional units; or courses 170 and 171 and 3 additional units. Business Administration 160 and 163 may be included as part of the major requirement in Journalism.

In addition, all majors are required to select a concentration of 15 units or two concentrations of 9 and 6 units, in any other field or fields of study offered by other departments of the University, with emphasis on the social sciences recommended. (By "field or fields of study" it is intended that the student shall select "related courses," not merely courses selected at random

* Not to be given, 1953-1954.

within a department.) These concentrations should be selected on the basis of the student's competence and special interest and must be approved by the Department. All courses in the concentrations must be from upper division offerings.

The Department reserves the right to restrict the student to not more than 24 units of upper division work in courses offered in the Department of Journalism.

Continuance in the major is contingent upon the student achieving at least a grade C average in courses taken in the major or required for the major.

Higher Degree.—For information concerning the requirements for the degree Master of Journalism consult the Dean of the Graduate Division or the Chairman of the Department of Journalism.

LOWER DIVISION COURSE

38. Mass Communication in the United States. (2) I.

The Staff (Mr. Desmond in charge)

Prerequisite: English 1A-1B or Speech 1A-1B or consent of instructor.

Lectures and critical writing in connection with the reading of important books and literature relating to the press, radio, and other media of information and opinion.

UPPER DIVISION COURSES

120A-120B. The News. (3-3) Yr. Mr. Pickerell, Mr. Griffin, Mr. Tomlinson

Two two-hour section meetings per week.

Prerequisite: English 1A-1B or Speech 1A-1B. Sophomore students may be admitted to the course with consent of the instructor. 120A is not a prerequisite to 120B.

120A. A comparative study of representative newspapers, emphasizing professional and social problems of news presentation.

120B. Problems of news treatment; writing and editing in experimental forms.

131. The Editor and the Community. (3) I.

Mr. Seidl

One lecture per week and two two-hour laboratory sections per week.

Prerequisite: course 120A-120B.

A study of the problems of newspaper content, news selection, and display, with special attention to investigation into newspaper audience reactions. A study based upon the student's observation of a selected community and the newspaper serving it will be required.

140. History of Journalism. (3) I.

Mr. Griffin

Study of the development of journalism, particularly in the United States, with an introduction to the important papers and personalities.

141. The Press and Society. (3) II.

Mr. Desmond

An examination of the press as an important institution in the nation and in the world.

150. Contemporary Editorial Problems. (3) II.

Mr. Rosenberg

Prerequisite: courses 120A-120B, 131, or consent of the instructor.

An examination of current problems, with practice in bibliographical and research methods, and writing in editorial and interpretative forms.

152. Magazine Article Writing. (3) I.

Mr. Reeve

Prerequisite: Upper division standing and consent of instructor.

Writing for magazines, specialized publications, and newspaper feature sections. Magazine publishing practices as they affect the professional writer.

153. Magazine Production and Writing. (3) II. Mr. Reeve
Prerequisite: Upper division standing and consent of instructor.
Editing, organization, operation and economy of magazines and specialized publications. Advanced problems in magazine writing. Each student will prepare a study of a selected periodical.
170. Principles of Publishing. (3) II. Mr. Seidl
Two lectures per week and one two-hour laboratory section.
Analysis of the economy, organization, and operation of daily and weekly newspapers.
171. Newspaper Advertising. (3) II. Mr. Rosenberg
Two lectures per week and one two-hour laboratory period.
Analysis of advertising principles of the daily and weekly newspaper, with attention to typography, layout, copy writing, and production.
180. Radio News Writing. (3) II. Mr. Greer
Lectures, discussion, and writing experience.
Prerequisite: course 120A-120B. Class limited to eighteen, with preference given to majors in journalism.
Theory and practice of news writing for radio and special events reporting, with special attention to problems of auditory communication.
184. The News and Public Affairs. (3) II. Mr. Griffin, Mr. Pickereil
Prerequisite: senior standing and consent of instructor.
The reporting of public affairs, with emphasis on background and interpretive stories.
190. The Press and World Affairs. (3) I. Mr. Desmond
Comparative world journalism, with an examination of sources of news from various capitals, and consideration of influences that affect information reaching the people about public affairs.
195. Critical Reviewing for the Press. (3) I. Mr. Rosenberg
Prerequisite: senior standing and the consent of the instructor.
Theory and technique of reviewing current literature, drama, film, and the arts. The reviewer's function in sustaining standards of artistic excellence, guiding popular taste, and providing constructive criticism for working artists. Practice in writing reviews.
199. Special Study for Advanced Students. (1-4) I and II.
The Staff (Mr. Desmond in charge)
Prerequisite: for students whose major is journalism, at least a B average in all journalism courses undertaken, or consent of the instructor; for others, at least a B average in all courses undertaken, and consent of the instructor.

GRADUATE COURSES

Prerequisite: courses 120A-120B and 140. Admission to all graduate courses is at the discretion of the instructor. See also page 10.

201. Research Methods in Journalism. (2) I and II. Mr. Rosenberg
Materials and techniques of journalistic research. Study of bibliographical method, historical and sociological investigation, quantitative and qualitative analysis. Required of all candidates for the Master of Journalism degree.
- *220. The Newspaper and Public Affairs. (3) II.
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.

* Not to be given, 1953-1954.

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.
240. Seminar in History of Journalism. (3) I. Mr. Griffin
263. Public Opinion, Propaganda and the Mass Media. (3) II. Mr. Pickerell
Critical analysis of the place of the press, radio, films and television in shaping the public mind; effects on public opinion of practices in these media; propaganda and information techniques of governments, political parties, pressure groups, and other organized bodies.
265. The Law of Communications. (3) I. Mr. 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) _____
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.
290. Seminar in Comparative World Journalism. (3) II. Mr. Desmond
299. Special Research Projects and Field Study in Communications. (1-4)
I and II. The Staff (Mr. Desmond in charge)
Individual investigation of a selected topic, conducted under guidance of a member of faculty. May be taken both semesters.

LANDSCAPE ARCHITECTURE

(Department Office, 101 Agriculture Hall)

Harry W. Shepherd, B.S., *Professor of Landscape Architecture.*

H. Leland Vaughan, B. of L.A., *Professor of Landscape Architecture (Chairman of Department).*

John W. Gregg, B.Sc., D.L.A., *Professor of Landscape Architecture, Emeritus.*

Roy B. Litton, Jr., M.L.A., *Assistant Professor of Landscape Architecture.*



Francis Violich, B.S., *Associate Professor of City Planning and Lecturer in Landscape Architecture.*

Departmental Major Adviser: Mr. Vaughan.

Preparation for the Major.—For courses required in preparation for the major see pages 84 and 88 of the CIRCULAR OF INFORMATION. For further information consult the PROSPECTUS OF THE COLLEGE OF AGRICULTURE.

The Major.—Required: Landscape Architecture 49 plus a minimum of 30 units in landscape architecture selected with the approval of the major adviser. (Courses 1A, 1B, 101A, 101B, and 114A or 114B should be included.)

LOWER DIVISION COURSES

1A-1B. Elementary Design and Theory. (3-3) Yr.

Lectures and laboratory.

Mr. Vaughan, Mr. Litton

Prerequisite: Architecture 1 or equivalent, and consent of the instructor.

The analysis and solution of typical site problems.

* Not to be given, 1953-1954.

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. Vaughan, Mr. Litton
 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. Vaughan
 Lecture, laboratory, and field trips.
 Problems of design and construction with special reference to grading, retaining walls, steps, pools, garden structures, fences, irrigation, and drainage systems; reports and estimates.
- 112A-112B. Plant Materials and Planting Design. (3-3) Yr. Mr. Shepherd
 Lecture, laboratory, and field trips.
 The form, habit, texture, and adaptation of coniferous, deciduous, and evergreen shrubs, broadleaf and coniferous trees.
 112A is not prerequisite to 112B.
- 113A-113B. Plant Materials and Planting Design. (3-3) Yr. Mr. Shepherd
 Lecture, laboratory, and field trips.
 The form, habit, and adaptation of alpiners, succulents, palms, tropical plants, natives, vines, and deciduous trees.
 113A is not prerequisite to 113B.
- 114A-114B. Advanced Design and Theory. (4-4) Yr.
 Lecture and laboratory. Mr. Litton, Mr. Vaughan
 Prerequisite: course 101A-101B.
 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.

LAW

(Department Office, 225 Law Building)

- 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., J.S.D., *Professor of Law*.
Judson F. Falknor, B.S., LL.B., *Walter Perry Johnson Professor of Law*.
William Warren Ferrier, Jr., A.B., J.D., *Professor of Law*.
¹ Richard W. Jennings, A.B., M.A., LL.B., *Professor of Law*.
Adrian A. Kragen, A.B., LL.B., *Shannon Cecil Turner Professor of Law*.
William T. Laube, Jr., A.B., J.D., LL.M., *Professor of Law*.
* Frank C. Newman, A.B., LL.B., LL.M., *Professor of Law*.
Covey T. Oliver, A.B., LL.B., LL.M., *Professor of Law*.
William Lloyd Prosser, A.B., LL.B., LL.D., *Elizabeth Josselyn Boalt Professor of Law (Chairman of the Department)*.
Stefan A. Riesenfeld, B.S., LL.B., Dr. jur., Dott. in giur., S.J.D., *Emanuel S. Heller Professor of Law*.
Arthur H. Sherry, A.B., LL.B., *Professor of Law and Criminology*.
Alexander M. Kidd, A.B., LL.B., *Elizabeth Josselyn Boalt Professor of Law, Emeritus*.
James Patterson McBaine, LL.B., LL.D., *A. F. and May T. Morrison Professor of Municipal Law, Emeritus*.
Edmond R. Anderson, Jr., A.B., LL.B., *Associate in Law*.
Eldon C. Parr, A.B., LL.B., *Associate in Law*.
David T. Steffen, A.B., LL.B., *Associate in Law*.



- J. Gordon Gose, A.B., LL.B., *Visiting Professor of Law*.
Sam Kagel, A.B., LL.B., *Lecturer in Law*.
William N. Keeler, A.B., J.D., *Lecturer in Law*.
Maurice Moonitz, Ph.D., C.P.A., *Professor of Business Administration and Lecturer in Law*.
Lloyd M. Robbins, Ph.D., D.C.L., *Lecturer and Consultant in Canon Law*.
Vernon M. Smith, A.B., LL.B., *Librarian of the Law Library and Lecturer in Law*.

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 \$187 each semester, which includes the incidental fee charged all students.

¹ In residence fall semester only, 1953-1954.

* Absent on leave, 1953-1954.

PROFESSIONAL CURRICULUM

First Year

200A-200B. Contracts. (3-3) Yr.	Mr. Laube
202. Crimes. (3) II.	Mr. Sherry
206A-206B. Pleading and Procedure in Civil Cases. (3-3) Yr.	Mr. Falknor
208A-208B. Property. (3-3) Yr.	Mr. Ferrier
210. Equity. (3) I.	Mr. Gose
212A-212B. Torts. (3-3) Yr.	Mr. Prosser
214A-214B. Legal Research and Writing. No credit. Yr.	Mr. Prosser
215. Legal History. No credit. II.	Mr. Ehrenzweig, Mr. Riesenfeld

Second Year

220. Administrative Law: First Course. (3) II.	Mr. Riesenfeld
222A-222B. Business Associations. (3-3) Yr.	Mr. Jennings, Mr. Gose
224A-224B. Constitutional Law. (2-2) Yr.	Mr. Barrett
226. Wills and Future Interests. (2) II.	Mr. Ferrier
228. Legal Accounting. (2) I.	Mr. Moonitz
230. Marital Property. (2) I.	Mrs. Armstrong
232. Security Transactions. (2) I.	Mr. Riesenfeld
236. Trusts. (2) I.	Mr. Oliver
237. Income Taxation. (3) II.	Mr. Kragen

Third Year

*240. Administrative Law: Second Course. (2) II.	_____
*242. Admiralty. (2) II.	Mr. Riesenfeld
243A-243B. Commercial Transactions. (2-2) Yr.	Mr. Laube
244. Creditors' Remedies. (3) I.	Mr. Riesenfeld
245. Comparative Jurisprudence. (2) I.	Mr. Ehrenzweig
246. Conflict of Laws. (3) II.	Mr. Ehrenzweig
247. Corporation Finance. (2) II.	Mr. Gose
248. Selected Problems in Corporations and Partnership. (2) I.	Mr. Jennings
*249. Corporate Reorganization. (2) II.	Mr. Riesenfeld
250A-250B. Evidence. (2-2) Yr.	Mr. Falknor
251. Selected Problems in Comparative Jurisprudence. (2) II.	Mr. Ehrenzweig

* Not to be given, 1953-1954.

253. Family Law. (2) II. Mrs. Armstrong
254. Federal Jurisdiction. (2) I. Mr. Barrett
- *256. Future Interests. (2) I. Mr. Ferrier
257. Insurance. (2) I. Mr. Ehrenzweig
258. International Law. (2) II. Mr. Oliver
262. Labor Law: First Course. (2) I. Mrs. Armstrong, Mr. Kagel
264. Labor Law: Second Course. (2) II. Mrs. Armstrong
265. Advanced Legal Writing. (1-2) I and II. Mr. Prosser
266. Legislation. (2) II. Mr. Kragen
267. Modern Pleading. (2) II. Mr. Barrett
- *268. Municipal Corporations. (2) II. _____
270. Government Control of Business. (2) II. Mr. Riesenfeld
274. Restitution. (2) I. Mr. Gose
276. Restraint of Trade and Unfair Competition. (3) I. Mr. Kragen
278. Selected Problems in Criminal Law and Administration. (2) I. Mr. Sherry
282. Estate, Inheritance, and Gift Taxation. (2) I. Mr. Oliver
283. Selected Problems in Estate and Tax Planning. (2) II. Mr. Oliver
284. Selected Problems in Taxation of Business Enterprise. (2) I. Mr. Kragen

Graduate Curriculum

- 285A-285B. Seminar in Administrative Law and Procedure. (2-2) Yr. Mr. Newman
- 286A-286B. Seminar in Business Organizations. (2-2) Yr. Mr. Jennings
- 287A-287B. Seminar in Commercial Transactions. (2-2) Yr. Mr. Laube, Mr. Prosser, Mr. Riesenfeld
- 288A-288B. Seminar in Constitutional Law. (2-2) Yr. Mr. Barrett
- 289A-289B. Seminar in Criminal Law and Procedure. (2-2) Yr. Mr. Sherry
- 290A-290B. Seminar in International and Maritime Law. (2-2) Yr. Mr. Oliver, Mr. Riesenfeld
- 291A-291B. Seminar in Labor Law and Procedure. (2-2) Yr. Mrs. Armstrong, Mr. Kagel, Mr. Riesenfeld
292. Seminar in Legal Education. (1) I and II. The Staff (Mr. Newman in charge)
- 293A-293B. Seminar in Legal History and Jurisprudence. (2-2) Yr. Mr. Ehrenzweig, Mr. Riesenfeld
- 294A-294B. Seminar in Legislation and Legislative Procedure. (2-2) Yr. Mr. Newman, Mr. Smith

* Not to be given, 1953-1954.

- 295A-295B. Seminar in Practice and Procedure. (2-2) Yr.
Mr. Falknor, Mr. Krage
- 296A-296B. Seminar in Property and Trust Administration. (2-2) Yr.
Mr. Ferrier, Mr. Oliver
- 297A-297B. Seminar in Public Finance and Taxation. (2-2) Yr.
Mr. Krage, Mr. Oliver
- 298A-298B. Seminar in Roman and Comparative Law. (2-2) Yr.
Mr. Ehrenzweig, Mr. Riesenfeld
299. Research in Legal Problems. (1-5) I and II.
The Staff (Mr. Oliver in charge)

LIBRARIANSHIP

(Department Office, 425 Library)

Donald Coney, M.A., *Professor of Librarianship.*

² J. Periam Danton, Ph.D., *Professor of Librarianship (Chairman of the Department).*

LeRoy C. Merritt, Ph.D., *Professor of Librarianship.*

Edward A. Wight, Ph.D., *Professor of Librarianship (Acting Chairman of the Department, fall semester).*

Edith M. Coulter, M.A., B.L.S., *Professor of Librarianship, Emeritus.*

Della J. Sisler, M.A., B.L.S., *Associate Professor of Librarianship, Emeritus.*

Anne Ethelyn Markley, M.A., *Associate Professor of Librarianship.*

Fredric John Mosher, Ph.D., *Associate Professor of Librarianship.*

Louis D. Sass, M.A., *Assistant Professor of 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.*

Raymond C. Swank, Ph.D., *Visiting Professor of Librarianship for the fall semester.*

Melvin J. Voigt, M.L.S., *Lecturer in Librarianship.*

The School of Librarianship is organized to offer a two-year curriculum. On completion of the first year with an average grade of at least C plus (1.5 grade-point average) 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

² In residence spring semester only, 1953-1954.

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. Students undertaking this work register and receive credit for Education 323, 4 units. To meet additional requirements of the State Department of Education for this credential, candidates should take the following courses before enrollment in the School, or after the completion of the first year's work: secondary education, educational psychology, and junior high school education, elementary education, or reading and literature in the elementary school (totaling at least 9 units).

PROFESSIONAL COURSES

In 1953-1954, courses in librarianship will be offered in summer sessions, and in the fall and spring semesters. Students may begin the first-year curriculum only with the fall semester or summer sessions. The second-year curriculum may be commenced in either the fall or spring semesters, and electives may be taken in summer sessions or in any semester.

First-Year Curriculum

The 24-unit program of each student must include the following basic courses: 201, 202, 203, 204; the remaining units are to be elected from other courses in the first-year curriculum and may include upper division or graduate courses in appropriate subjects approved by the Dean of the School of Librarianship. Students who fail to make at least a C plus (1.5 grade-point average) in the first semester will not be permitted to enroll in the second semester.

201. Introductory Classification and Cataloguing. (4) I. Miss Markley

Introduction to library classification with application of Dewey decimal system and brief comparison with Library of Congress system; functions of the catalogue; principles of catalogue entry based on American Library Association catalogue rules; methods of descriptive cataloguing based on modification of Library of Congress rules; introduction to 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, Mr. Sass
Lectures, discussions, and reports on assigned problems.
Basic reference materials including national and subject bibliography.
203. Introduction to Librarianship. (3) I. Mr. Wight
Orientation of the new student in the profession of librarianship. Introductory survey of the evolution of modern libraries and basic information about the principal fields of library service, with emphasis on major trends and problems. Readings and written reports.
204. Communication: History, Institutions, Media. (2) I. Mr. Merritt, Mr. Sass
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. Sass
Theories, principles, and practice of selecting books and other library materials. Techniques of acquisition by public, school, and academic libraries.
206. School Library Administration. (2) II. Miss Boyd
A general survey of elementary and secondary school libraries. Emphasis on the function, administration, organization, services, materials, and the planning and equipment of school libraries in relation to the modern school. Lectures, committee and individual reports, readings, class discussions, and field trips. Experiences gained in practice work are utilized.
207. Municipal and County Library Administration. (2) II. Mr. Wight
Government, organization, and administration of municipal, county, and regional public libraries. Library service programs in relation to varying community patterns. Lectures, readings, reports, field trips.
208. College and University Library Administration. (2) II. Mr. Danton
A general introduction to the organization and administration of college and university libraries and their place in the institutions of which they are a part. Problems and practices with respect to the library's government, functions, staff, collections, finances, and building are considered by means of written assignments, readings, and class discussion.
209. Library Work with Children. (2) II. Miss Garvey
Lectures and discussion.
A general survey of children's books and reading preferences. Historical backgrounds and development; types of children's literature; levels of interest; criticism and evaluation; illustration; trends; book selection; storytelling; organization and administration of a children's room in a public library.

211. Development of the Book. (2) II. Mr. Mosher
Prerequisite: consent of instructor.
Materials and techniques of book production. Early records and the manuscript period. Development of paper, type, and binding. Letterpress, offset, rotogravure, and other methods of printing. Modern developments in recording on disks, film, and wire.
212. Reference and Government Publications. (4) II. Mr. Mosher, Mr. Sass
A continuation of course 202. Sources of information in subject fields. Emphasis is placed on types of information in foreign, national, state, and municipal documents. Problems in informational service.
214. Special Problems in Classification and Cataloguing. (2) II.
Prerequisite: course 201 or equivalent. Miss Markley
Cataloguing and classification of library materials requiring special description and analysis; practice in the use of Library of Congress classification and subject headings; arrangement of the catalogue; administration of the cataloguing department.
215. Reading and Reading Interests. (2) II. Mr. Merritt
Reading interests, habits, and needs of different types and groups of readers. The nature of reading; problems of reading; selection of reading by children, college students, and public library patrons. The role of the library in adult education.
217. Bibliography of Science and Technology. (2) II. Mr. Voigt
Prerequisite: basic college courses in chemistry and physics.
Scientific and technical literature with emphasis on reference and bibliographical aids. Periodical and serial literature and its use and control through abstracts and indexes.

Program for the Degree of Master of Library Science

Candidates for the master's degree must be accepted in graduate standing, without deficiencies, in the University of California, must have completed with a grade of at least B the first-year curriculum in a graduate—Type I or II—library school, accredited by the American Library Association and approved by the University of California, must have not less than 8 units each of two modern foreign languages, and must take the Graduate Record Examination, Profile and Aptitude Tests. 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. Miss Markley
 Modern trends and problems in cataloguing with emphasis on coöperative cataloguing, cataloguing policies, and the handling of unusual types of material; study of the theory of subject cataloguing; discussion and reports.
- *219. *Advanced Classification.* (2) I. Miss Markley
 History and theory of classification; comparative study of library classification systems leading, in the latter half of the semester, to intensive study and use of the Library of Congress system; individual problem or paper.
- 220A-220B. *Bibliography.* (2-2) Yr. Miss Markley
 Prerequisite: courses 202 and 212 or equivalent.
 Methods and materials of bibliographical investigation. Location and description of books and manuscripts in special collections in America. Problems and reports.
221. *Book Collecting for University Libraries.* (2) I. Mr. Swank
 Prerequisite: courses 205, 208.
 Problems connected with the acquisition, development, and maintenance of the book, periodical, and other collections of university libraries. Required of all master's degree candidates who intend to specialize in the college and university library field.
225. *History of Libraries.* (2) I. Mr. Sass
 Growth and development of the library as an institution in ancient, medieval, and modern civilization. The effect of political and social changes on the migration of manuscripts and books. Reports and papers.
226. *History of Printing.* (2) I. Mr. Mosher
 Prerequisite: course 211 or equivalent.
 Intensive study in selected phases of the history of printing; seminar discussion and individual projects of a bibliographical, historical, or book production nature.
228. *Problems in Reading.* (2) I. Mr. Merritt
 Prerequisite: course 215.
 Analysis of reading of college students and the general adult population in terms of characteristics and interests of readers, distribution and content of publications, methods of stimulating reading, and the effects of reading; the library and adult education.
230. *Library Administration.* (2) I. Mr. 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.

* Not to be given, 1953-1954.

† Not to be given, 1953-1954; to be given 1954-1955.

234. Problems in Public Library Administration. (2) II. Mr. Wight
Prerequisite: courses 207, 230.
Detailed application of the principles of public administration to the management and operation of public libraries. Case study approach through critical analysis of the functions and problems of selected libraries. Assignments adapted to special interests of students. Required of all master's degree candidates who intend to specialize in the public library field.
238. Library in the Community. (2) II. Mr. Wight
Analysis of the community for the librarian. Social backgrounds, economic and educational levels, and community groups, as they affect library use. Methods of integrating the library with the community.
240. Content Analysis. (2) II. Mr. Merritt
Problems in methods of determining maturity level, social and moral attitudes, and other educational and propagandistic assumptions in books, magazines, and other library materials.
251. Methods of Research in Librarianship. (2) I. Mr. Mosher, Mr. Sass, Mr. Wight
History and function of research in contemporary society. Values and meaning of research. Techniques of bibliographical, historical, and sociological research, and their implications for the definition and investigation of library problems. Required of all candidates for the master's degree.
299. Special Study. (1-8) I and II. Mr. Merritt (in charge), Mr. Coney, Miss Markley, Mr. Mosher, Mr. Sass, Mr. Wight
Individual direction of student's choice, planning and writing of master's essay. May be elected either semester.

LINGUISTICS

(Department Office, 5218 Dwinelle Hall)

- C. Douglas Chrétien, Ph.D., *Professor of Linguistics and Speech.*
Murray B. Emeneau, Ph.D., *Professor of General Linguistics and Sanskrit*
(*Chairman of the Department of Linguistics*).
‡Mary R. Haas, Ph.D., *Associate Professor of Linguistics and Siamese.*



- Yuen Ren Chao, Ph.D., Litt.D., *Agassiz Professor of Oriental Languages and Literature.*
Yakov Malkiel, Ph.D., *Professor of Romance Philology.*
†Madison S. Beeler, Ph.D., *Associate Professor of German.*
Denzel R. Carr, Ph.D., *Associate Professor of Oriental Languages.*
Oleg A. Maslennikov, Ph.D., *Associate Professor of Slavic Languages.*
Francis J. Whitfield, Ph.D., *Associate Professor of Slavic Languages.*
David W. Reed, Ph.D., *Assistant Professor of English.*

Letters and Science List.—All undergraduate courses in Linguistics are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

The degrees of Master of Arts and Doctor of Philosophy will be conferred upon qualified graduate students who complete the requirements, for which prospective candidates should consult the Chairman of the Department or

† Sabbatical leave in residence, spring semester 1953-1954.

‡ Sabbatical leave in residence, 1953-1954.

the Dean of the Graduate Division. Basic requirements looking toward these degrees include a major in a language department or a combination of language courses.

Courses in specific languages are offered by the departments of Classics (Greek, Latin, Sanskrit), English (Old and Middle English, Celtic), French, German (including Old and Middle High German, Gothic, Old Saxon, Old Icelandic, Dutch), Italian, Near Eastern Languages (Hebrew, Arabic, Syriac, Assyrian, Sumerian, Egyptian, Coptic), Oriental Languages (Chinese, Japanese, Korean, Indonesian and Malayo-Polynesian, Mongolian, Tibetan, Siamese), Romance Philology (Late Latin, Provençal), Scandinavian Languages (Swedish, Norwegian, Danish), Slavic Languages (Russian, Polish, Serbo-Croatian), Czech, Old Church Slavic, Early Russian), and Spanish and Portuguese. See also list of Related Courses in Other Departments, page 217.

UPPER DIVISION COURSES

100. Introduction to General Linguistics. (3) I. Mr. Chrétien
(Formerly Classics 193.)
The principles and techniques of descriptive and comparative grammar.
130. Phonetics and Phonemics. (2) I. Miss Haas
(Formerly Oriental Languages 167.)
Open to qualified language students and students of anthropology.
140. Linguistic Analysis. (3) II. Mr. Emeneau
(Formerly Classics 195.)
Prerequisite: course 130, or equivalent course in phonetics and phonemics.
Lectures and practice in analysis of morphology and syntax.
145. Types of Linguistic Structure. (2) II. Miss Haas
(Formerly Oriental Languages 177.)
A rapid general survey followed by a more detailed presentation of selected Far Eastern and American Indian languages. Open to qualified language students and students of anthropology who have had course 130 or equivalent.
150. Introduction to Indo-European Comparative Grammar. (3) I. Mr. Emeneau
(Formerly Classics 196.)
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.
- *170. American Indian Languages. (2) II. Miss Haas
(Formerly Oriental Languages 178.)
A brief survey of the native languages of North America; grammatical structure of selected languages; the application of the comparative method to American Indian languages.
- *190A-190B. Linguistics Laboratory. (3-3) Yr. Miss Haas
(Formerly Oriental Languages 197A-197B.)
The technique of recording and analyzing a foreign language by working directly with a native speaker. Open to qualified language students and students of anthropology who have had course 130 and either 140 or 145. May be repeated without duplication of credit with consent of instructor.

GRADUATE COURSES

200. Pro-Seminar. (2) II. Mr. Chrétien
Introduction to research.

* Not to be given, 1953-1954.

*207. Statistical Linguistics. (2) II.	Mr. Chrétien
†230A-230B. Seminar in Descriptive Linguistics. (2-2) Yr. (Formerly Oriental Languages 207A-207B.)	The Staff
†250A-250B. Seminar in Historical Linguistics. (2-2) Yr. (Formerly Oriental Languages 227A-227B.)	The Staff
*270. Problems in Pacific Linguistics. (2) II.	Mr. Chrétien
298. Special Study. (1-5) I and II.	The Staff
299. Directed Research. (1-5) I and II.	The Staff

RELATED COURSES IN OTHER DEPARTMENTS

- Language and Culture (Anthropology 120, Mr. Rowe).
 Language (English 25, Mr. Reed).
 Comparative Grammar of Greek and Latin (Greek 139A-139B, Mr. Helmbold).
 Germanic Linguistics (German 260, Mr. Beeler).
 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).
 Comparative Slavic Linguistics (Slavic Languages 220, Mr. Whitfield).
 Linguistic Geography Applied to Romance Dialectology (Romance Philology 205, Mr. Malkiel).
 General Phonetics (Speech 103, Mr. Chrétien).

MATHEMATICS

(Department Office, 5319 Dwinelle Hall)

- Griffith C. Evans, Ph.D., *Professor of Mathematics.*
 Alfred L. Foster, Ph.D., *Professor of Mathematics.*
 * John L. Kelly, Ph.D., *Professor of Mathematics.*
 Derrick H. Lehmer, Ph.D., *Professor of Mathematics.*
 Hans Lewy, 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.*
 Henry Scheffé, Ph.D., *Professor of Mathematics and Assistant Director of the Statistical Laboratory.*
 Alfred Tarski, Ph.D., *Professor of Mathematics.*
 Frantisek Wolf, Ph.D., *Professor of Mathematics.*
 Benjamin A. Bernstein, Ph.D., *Professor of Mathematics, Emeritus.*
 Thomas Buck, Ph.D., *Professor of Mathematics, Emeritus.*

* Not to be given, 1953-1954.

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

‡ In residence spring semester only, 1953-1954.

- Charles A. Noble, Ph.D., *Professor of Mathematics, Emeritus.*
 Pauline Sperry, Ph.D., *Associate Professor of Mathematics, Emeritus.*
 Arthur R. Williams, Ph.D., *Assistant Professor of Mathematics, Emeritus.*
 Edward W. Barankin, Ph.D., *Associate Professor of Mathematics.*
 Joseph L. Hodges, Jr., Ph.D., *Associate Professor of Mathematics.*
 Erich L. Lehmann, Ph.D., *Associate Professor of Mathematics.*
 Edmund Pinney, Ph.D., *Associate Professor of Mathematics.*
 Raymond H. Sciobereti, Ph.D., *Associate Professor of Mathematics.*
 Paul L. Chambré, Ph.D., *Assistant Professor of Mathematics.*
 Stephen P. Diliberto, Ph.D., *Assistant Professor of Mathematics.*
 Evelyn A. Fix, Ph.D., *Assistant Professor of Mathematics.*
 Harley Flanders, Ph.D., *Assistant Professor of Mathematics.*
 Leon A. Henkin, Ph.D., *Assistant Professor of Mathematics.*
 Harry M. Hughes, Ph.D., *Assistant Professor of Mathematics.*
 Terry A. Jeeves, Ph.D., *Assistant Professor of Mathematics.*
 Ralph M. Lakness, Ph.D., *Assistant Professor of Mathematics.*
 Lucien M. LeCam, Ph.D., *Assistant Professor of Mathematics.*
 Murray Harold Protter, Ph.D., *Acting 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.*
 Anne C. Davis, Ph.D., *Instructor in Mathematics.*
 Marvin P. Epstein, Ph.D., *Instructor in Mathematics.*
 David C. Kleinecke, M.A., *Instructor in Mathematics.*
 J. Paul Roth, Ph.D., *Instructor in Mathematics.*
 Robert A. Wijsman, Ph.D., *Instructor in Mathematics.*



- Helen Pearl Beard, Ph.D., *Visiting Assistant Professor of Mathematics for the fall semester.*
 Harald Cramér, Ph.D., D.Sc. (h.c.), *Visiting Professor of Mathematics for the fall semester.*
 George M. Kuznets, Ph.D., *Professor of Agricultural Economics.*
 Benson Mates, Ph.D., *Associate Professor of Philosophy.*
 William Herman L. Meyer, Jr., Ph.D., *Visiting Associate Professor of Mathematics.*
 Joseph Putter, Ph.D., *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 Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Foster; Miss Scott (*Statistics*).

THE MAJOR IN MATHEMATICS

Preparation for the Major in Mathematics.—*Adviser:* Mr. Foster.

Before taking the upper division courses for the major, the student is required to have a basis of knowledge equivalent to courses C, G, 8, 9, 3A-3B, 4A-4B. It is desirable, therefore, that he should have completed in high school two years of algebra, plane and solid geometry, and trigonometry, in order to anticipate as much of this work as possible.

The Major in Mathematics.—In the 24 units of upper division work required for the major in mathematics, the student is supposed to acquire 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 or public health.

The Major in Mathematical Statistics.—In the 24 unit major the student should acquire substantial knowledge of statistics and probability, combined with a background in the theory of functions of real and of complex variables. To this end, the program should include courses 113, 120A, and at least 3 units in courses 120B, 132, 166. It is recommended that 120A, 120B be combined with 120C, 120D. In addition, the student should select any three of the courses 109, 111, 119, 150 and 185 and take at least three units in each.

Those contemplating graduate studies leading to higher degrees in statistics should make an effort to include in the major the undergraduate courses which are prerequisite to the graduate ones.

Attention of the student is drawn to the possibility of a group major in statistics combined with an empirical science. This major includes courses 130A, 130B, 130C, 130D, and 132.

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.

School of Business Administration.—Course 2, mathematics of finance and business, is a prerequisite for students in the School of Business Administration. As an alternative, however, course 16A-16B, analytic geometry and calculus, or course 3A-3B, plane analytic geometry and calculus, may be substituted, if students wish to continue with advanced mathematics.

LOWER DIVISION COURSES

- C. Trigonometry. (3) I and II. ——— 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. Meyer 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.

Mr. Swinford

1. College Algebra. (3) I and II.

_____ 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 course 1. Students who show little or no knowledge of algebra will not be allowed to enroll.

2. Mathematics of Finance and Business. (3) I and II.

_____ and the Staff

Prerequisite: two years of high school algebra or course D. Prescribed in the School of Business Administration. Not open to students who have completed or are taking Engineering 120.

3A. Analytic Geometry and Calculus, First Course. (3) I and II.

Mr. Pinney 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.

Elements of differential calculus and analytic geometry.

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

Mr. Diliberto and the Staff

Prerequisite: course 3A or course 11A-11B, or course 16A-16B.

Continuation of 3A. Analytic geometry, differential and integral calculus.

A special section is arranged for students who have taken a semester course of analytic geometry without calculus.

3H. Analytic Geometry and Calculus, Second Course. (3) I and II.

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.

_____ 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. Lakness 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. Henkin

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. Sciobereti 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. Meyer
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.
The Staff
Prerequisite: same as for 4A.
8. Theory of Algebraic Equations. (3) I and II. Mrs. Davis, Mr. Pinney
Prerequisite: two years of high school algebra (or course D) and course 3A.
Determinants, equations of third and fourth degrees, theory of equations.
9. Introduction to Projective Geometry. (3) I and II. Mr. Flanders
Prerequisite: course G or high school solid geometry, and course 8 or its equivalent.
Projective theory of one-dimensional forms, point and line conics. Mainly by the synthetic method.
- *10. Spherical Trigonometry. (2) I. _____
Prerequisite: one and one-half years of high school algebra, or course D, and plane trigonometry. Not open to students who have credit in Astronomy 8.
12. Elements of Probability and Statistics. (3) I and II. (See Statistics, below.)
- 14A-14B. Calculus and Advanced Calculus. (5-5) Yr. _____
Prerequisite: course 3B.
Covers approximately the subject matter of courses 4A-4B, 110A-110B.
- 16A-16B. Analytic Geometry and Calculus. (3-3) Yr.
Mr. Swinford and the Staff
Prerequisite: two years of high school algebra or course D (passed with a grade of C or better), plane geometry, plane trigonometry.
A short course in analytic geometry and differential and integral calculus. Primarily for students in the College of Agriculture.

RELATED COURSE IN ANOTHER DEPARTMENT

Logic. (Philosophy 12A-12B). (3-3) Yr.

UPPER DIVISION COURSES

- 101A-101B. Elementary Mathematics for Advanced Students. (3-3) Yr.
Mrs. McDonald, Mr. 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.

* Not to be given, 1953-1954.

107. Mathematics in Secondary Schools. (2) I. Mrs. McDonald
 Enhancing content through applications; coordination; survey of materials; analysis of present-day tendencies. For seniors and graduate students. This course will be accepted in partial satisfaction of the requirement in education for the Certificate of Completion of the teacher-training curriculum.
- 109A-109B. Mathematical Logic. (3-3) Yr. Mr. Mates
 Prerequisite: Philosophy 12A and Mathematics 3B or 8.
 Elements of mathematical logic: sentential connectives, quantifiers, identity. Introduction into metalogical problems. Examples of formalized mathematical theories.
 Boolean algebras: fundamental notions and postulates, verification of identities, infinite operations, atomic elements, ideals, representation problem. Connections between logic and Boolean algebras.
- 110A-110B. Advanced Engineering Mathematics. (2-2) Yr. Beginning each semester. Mr. Chambré, Mrs. McDonald
 Prerequisite: course 4A-4B. Primarily for students in engineering.
 Conjugate functions, hyperbolic functions, Fourier series, differential equations.
110. Advanced Engineering Mathematics. Double Course. (4) II. The Staff
 Prerequisite: same as for 110A-110B.
- 111A-111B. Algebra. (3-3) Yr. Beginning each semester. Mr. Barankin, Mr. Flanders
 111A: Linear dependence, matrices, characteristic values, quadratic forms.
 111B. Groups, theory of equations, introduction to Galois theory, elements of ring theory.
 Prerequisite: courses 4A-4B, 8.
- 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. Sciobereti
 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. Chambré, Mr. Lakness, Mr. Morse, Mr. Wolf
Prerequisite: course 4A-4B, with honor grades; or 14A-14B; or 4A-4B and 110A-110B; or consent of instructor.
Differential equations and analysis. Numerical solutions of differential equations, general properties and special types of differential equations; Bessel functions and Legendre polynomials.
- 120A-120B. Theory of Probability and Statistics. (3-3) Yr. (See Statistics, below.)
121. Mathematical Introduction to Economics. (3) I. Mr. Evans
Prerequisite: course 4A-4B.
Monopoly, competition, theory of dimension, taxation, utility, economic dynamics.
- 127A-127B. Foundations of Mathematics. (3-3) Yr. Mr. Robinson
Prerequisite: courses 3A-3B and 8. Mathematics 109A is desirable.
Elements of set theory: operations on sets; relations, functions, set-theoretical equivalence; cardinals, ordinals; ordering, well ordering; introduction into axiomatic foundations.
Elements of theoretical arithmetic: natural numbers; successive extensions—integers, rationals, real numbers; basic arithmetical operations; applications of continuity principle.
128. Numerical Analysis. (3) I. 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. Hodges
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 255A or course 201B.
185. Introduction to the Theory of Functions of a Complex Variable. (3) I and II. Mr. Morrey
Prerequisite: course 119A or 150A.
Differentiability of complex functions. Cauchy's integral. Power series. Laurent series. Analytic continuation. Singularities of analytic functions. Residue theorem; applications to definite integrals. Conformal mapping. Fourier and Laplace transforms with applications. Concepts and theorems as well as manipulation will be stressed.
- 190A-190B. Survey of Algebra and Analysis. (3-3) Yr. Mr. Sciobereti
For upper division and graduate students in social sciences, particularly economics, without college training in mathematics. Topics include elementary algebra, algebraic equations, matrices, differential and integral calculus, difference equations. Illustrations will be drawn from the social sciences, especially economics.

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

Mr. Foster in charge

Investigation of special problems under the direction of members of the department. In particular, this course offers an opportunity to students with facility for mathematics to anticipate some of the advanced courses by individual study.

TEACHERS' COURSE

*307. Coördination of Teaching of Mathematics. (2) I and II.

Group discussion.

Mrs. McDonald

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

201A-201B. Function Theory. (3-3) Yr.

Mr. Evans

Prerequisite: courses 111A, 119A-119B.

Point sets in Euclidean space, measure, generalizations of integral including Lebesgue and Lebesgue-Stieltjes integrals; classical theorems on the complex variables; application of real variable theory to complex variable.

Students with facility for mathematics may well take this course in the senior year. It includes the material of course 150A-150B.

205A-205B. Theory of Functions of a Complex Variable. (3-3) Yr.

Prerequisite: course 201A-201B.

Mr. Lehmer

The theory of analytic functions and topics such as meromorphic functions, entire functions, modular functions, and Abelian integrals, analytic theory of differential equations, inequalities, etc., at the pleasure of the instructor.

210A-210B. Theory of Functions of a Real Variable. (3-3) Yr. Mr. Loève

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. Diliberto

Convergence, compactness, completeness, function space topologies and metrization. Connectedness, local connectedness, the fundamental group, homology theories, duality and fixed point theorems.

220A-220B. Differential Equations. (3-3) Yr.

Mr. Pinney

General theories, topics in ordinary and partial differential equations, boundary value problems. This course presupposes some knowledge of complex and real variable theory.

221A-221B. Logarithmic and Newtonian Potential. (3-3) Yr.

Prerequisite: course 201A-201B or equivalent.

Mr. Lakness

Relation to distributions of mass, analysis of harmonic functions, tensor invariants in Euclidean and Riemannian metric spaces.

222A-222B. Advanced Differential Equations. (3-3) Yr.

Mr. Lewy

Prerequisite: courses 220A-220B and either 201A-201B or 150A-150B and 185.

Theory of initial value and boundary value problems for hyperbolic, parabolic, and elliptic partial differential equations with emphasis on non-linear equations.

* Not to be given, 1953-1954.

- 225A-225B. *Metamathematics*. (3-3) Yr. Mr. Henkin
 Prerequisite: courses 109A-109B, 127A.
 Formalized mathematical theories. Symbols, concatenation, formulas, sentences, derivability, axiomatic basis. Consistency and completeness. Notions of model and consequence—their relations to consistency and derivability. Application to formalized number theory. Truth and probability—their mutual relations. Introduction to the decision problem.
- *230A-230B. *Algebraic Geometry*. (3-3) Yr. Mr. Seidenberg
 Theory of algebraic functions. Algebraic varieties; in particular, algebraic curves. Bezout's theorem. Branches of a curve. Linear series. Theorem of Riemann-Roch. Emphasis will be on algebraic methods.
- *235A-235B. *Set Theory*. (3-3) Yr. Mr. Tarski
 Prerequisite: courses 109A, 127A-127B.
 Fundamental notions and axioms. Sets, their families, rings, fields. Finiteness and infinity. Relations, functions, images. One-to-one correspondence, set-theoretical equivalence, cardinal numbers. Similarity of relations, relation numbers. Partial and simple order. Well-ordering, arithmetic of ordinals. Applications of set theory, selected topics.
- 240A-240B. *Differential Geometry*. (3-3) Yr. ———
 Differential geometry with tensor analysis. Intrinsic geometry of surfaces. Parallel displacement of Levi Civita. Riemannian geometry of n -dimensions. Non-Riemannian geometry of Weyl and others.
- 245A-245B. *Introduction to Modern Algebra*. (3-3) Yr. Mr. Tarski
 Prerequisite: courses 109A-109B, 111A-111B, and 127A.
 General notion of an algebraic system. Subalgebras. Isomorphism. Homomorphism and equivalence relations. Direct products. Free algebras. Applications of general notions to special algebraic systems: groups, rings, fields, lattices, Boolean algebras.
- 250A-250B. *Algebra*. (3-3) Yr. Mr. Foster
 Prerequisite: course 111A-111B.
 Topics in theory of fields, algebraic and transcendental extensions, Galois theory, valuations, ideal theory, representation theory.
- 255A-255B. *Probability Theory and Its Analytic Basis*. (3-3) Yr.
 (See Statistics, below.)
- 255C-255D. *Laboratory Course in Probability Theory and Its Analytic Basis*. (1-1) Yr. (See Statistics, below.)
- 265A-265B. *Advanced Probability*. (3-3) Yr. (See Statistics, below.)
270. *Technical Hydrodynamics*. (3) II. ———
 Theoretical analyses of motion of frictionless and viscous fluids, flow of compressible fluids at sub- and supersonic velocities.
290. *Seminars*. (2-6) I and II. The Staff (Mr. 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 1953-1954 there will be, in particular, lecture seminars on the following subjects, in charge of the persons indicated:
 (a) Structure theory of algebraic systems, I, II, Mr. Foster; (c) Operators in Banach space and applied mathematics, I, II, Mr. Wolf; (d) Measure theory and integration, I, II, Mr. Morse; (e) Foundations

* Not to be given, 1953-1954.

and abstract algebra, I, II, Mr. Tarski; (f) Non-linear mechanics, I, II, Mr. Diliberto; (g) Topics in differential equations and calculus of variations, I, II, Mr. Lewy; (h) Algebra and number theory, I, II, Mr. Flanders.

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. Scheffé, Mr. Jeeves, Mr. Barankin, Miss Beard
I. Mr. Scheffé in charge, Mr. Jeeves, Miss Beard.
II. Mr. Barankin.

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.
I. Mr. LeCam; II. Mr. Jeeves. Mr. LeCam, Mr. Jeeves
Prerequisite: courses 3A-3B or 11A-11B or 16A-16B, and course 12.
Continuation of course 12. Expectation, variance, correlation, regression. Probability generating function. Weak law of large numbers. Elements of estimation. Cramér-Rao inequality. Basic ideas of confidence intervals. Applications.

- 120A-120B. Theory of Probability and Statistics. (3-3) Yr. Mr. Lehmann
Prerequisite: courses 4A-4B, 150A-150B (which may be taken concurrently), and 113. It is recommended that 120C-120D be taken concurrently.

Continuation of course 113. Theorem of Laplace (univariate and multivariate). Asymptotic distribution of χ^2 . General definition of probability. Calculus of probability densities. Likelihood ratio tests with applications. Distribution of χ^2 , t and F . General linear hypotheses. Gauss-Markoff theorem.

- 120C-120D. Laboratory Course in Theory of Probability and Statistics. (1-1) Yr.
Mr. Lehmann in charge
May be taken in conjunction with course 120A-120B. Course 120C is not prerequisite to 120D.

128. Numerical Analysis. (3) I. (See Mathematics, above.)

- 130A-130B. Statistical Inference. (3-3) Yr. Miss Scott
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, 130G may be taken for credit.

The basic concepts and principal tools of probability theory, hypothesis testing, and estimation, presented for students of natural and social sciences. While the conceptual and applicational aspects are treated carefully, the more difficult mathematical theorems are stated without proof.

- 130C-130D. Laboratory Course in Statistical Inference. (1-1) Yr.
Miss Scott 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, 130G 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.
- 130G. Statistical Inference for City Planning. (3) I. Mr. Hodges
Lectures and laboratory.
Not open for credit to students who have completed courses 12 and 113. Not more than one of the courses 130A, 130E, 130G may be taken for credit.
Prerequisite: two years of high school algebra or course D.
Essential elements of course 130A-130B with the applications and illustrations chosen from such fields as sampling from and growth of human populations.
132. Descriptive Statistics. (3) II. Mr. Hodges
Lectures and laboratory.
Prerequisite: course 113 or 130A; and course 4A-4B, or grade of at least B in course 3A-3B or 11A-11B.
Collective and individual characters. Mathematical statistics as theory of collective characters. Means. Measures of dispersion. Frequency curves. Moments. Sheppard's corrections. Pearson curves. Curves of Charlier. Methods of fitting. Stochastic explanation of various distributions. Multivariate distributions. Static regressions and correlations. Applications.
- 142A-142B. Life Contingencies. (3-3) Yr. Miss Fix
Prerequisite: courses 12 and 113 or 130A and 130C. It is recommended that 142C-142D be taken concurrently.
Mortality tables and related functions. Laws of mortality. Annuities and assurances for one and more than one life. Policy reserves. Return of premiums. Rule of uniform seniority. Disability insurance. Some statistical applications of the mortality table. Survey of mortality tables.
- 142C-142D. Laboratory Course in Life Contingencies. (1-1) Yr.
Miss Fix in charge
May be taken in conjunction with course 142A-142B.
144. Population Statistics. (3) II. Miss Fix
Prerequisite: courses 12 and 3A, or 130A.
Collection of data. Intercensal and postcensal populations. Formulas for mortality tables. Incompleteness of population data. Incompleteness of birth and death registrations. Infant mortality rates. Errors in age. Construction of mortality tables.
166. Sampling Surveys. (3) I. Miss Fix
Prerequisite: Mathematics 12 or 130A or consent of instructor.
Recommended: course 113.
Mathematical theory of sampling. Best linear unbiased estimates and their variances. Sampling methods: unrestrictedly random, stratified and double sampling methods of Friedman-Wilcox. Sequential approach to stratification of the sample.

GRADUATE COURSES

Courses 255A-255B and 260A-260B constitute the basis of graduate instruction in theory.

Courses 261, 263, and 264 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.

Students engaged in research in experimental sciences may register in courses 261, 263, or 264 without the specified prerequisites, with the consent of the instructor.

*254. Generating Functions. (3) II.

Prerequisite: courses 150A-150B and 185.

Trigonometric integrals. Characteristic functions. Laplace transform. Mellin transform. Applications to difference equations.

255A-255B. Probability Theory and Its Analytic Basis. (3-3) Yr.

Mr. Barankin

Prerequisite: courses 150A-150B and 185. It is recommended that course 255C-255D be taken concurrently.

Basic concepts of measure theory: sets, measures, measurable functions, integrals. Axiomatic foundations of probability theory. Distribution functions and characteristic functions. Central limit problem; infinitely divisible laws. Strong laws of large numbers.

255C-255D. Laboratory Course in Probability Theory and Its Analytic Basis. (1-1) Yr.

Mr. Barankin in charge

Prerequisite: courses 150A-150B and 185.

May be taken with 255A-255B. Illustrative examples in probability theory and applications to probability problems in various fields such as statistical physics.

*256. Nonparametric Inference. (3) I.

Mr. Lehmann

Prerequisite: course 260A.

Theory of some current tests. Asymptotic distribution theory. Unbiased and consistent point estimation. Theory of optimum rank tests and of tests based on permutation of observations. Tolerance and confidence limits.

257. Sequential Analysis. (3) I.

Mr. LeCam

Prerequisite: course 260A.

General theory of sequential procedures. Stein's two-sample procedures. Wald's sequential probability ratio test. Sequential point and interval estimation. Stochastic approximation methods.

258. Theory of Statistical Decision Functions. (3) II.

Mr. LeCam

Prerequisite: course 260A-260B.

Theory of statistical decision functions as a generalization of theories of tests and of estimation. Decision problems viewed as two-person zero sum games. Determinateness. Bayes solutions. Characterization of complete families and of minimax procedures. Applications to specific decision problems.

259. Probability Models of Natural Phenomena. (3) II.

Prerequisite: course 260A-260B.

Mr. Neyman, Miss Scott

Relation between natural phenomena and their mathematical theory. Interpolation formula and structural model. Deterministic and stochastic models. Static stochastic models. Dynamic stochastic models. Problem of adequacy. Examples from astronomy, general biology, and economics.

* Not to be given, 1953-1954.

- 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 255A is prerequisite to 260B. It is recommended that 260C-260D be taken concurrently.
 Continuation of course 120A-120B. Early principles of statistical tests. Testing simple hypotheses. Best similar and best invariant tests of composite hypotheses. Linear hypothesis. Confidence intervals. 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. Miss Scott
 May be taken in conjunction with course 260A-260B. Course 260C is not prerequisite to 260D.
261. Statistical Problems in Experimentation. (3) II. Mr. Scheffé
 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.
- *262. Statistical Inference in Relation to Stochastic Processes. (3) I. ———
 Prerequisite: course 255A-255B and 260A-260B or consent of instructor.
 Stochastic processes and certain types of hypotheses concerning them. Observable variables. Tests of hypotheses. Problems of estimation.
263. Statistical Studies of Risks. (3) I. Mr. Cramér
 Lectures and laboratory.
 Prerequisite: course 130A-130B or 113.
 Life and sickness tables. Standard error of a table. Law of Gompertz-Makeham. Standardization of rates of risk. Epidemiological and medical statistics. Theory of growth. Simple random processes explaining various population phenomena. Problems of social and commercial insurance.
264. Statistical Problems of Mass Production and Control of Quality. (3) I. Mr. Scheffé
 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: course 255A-255B or consent of instructor.
 Recent developments in the theory of probability. Stochastic processes. Markoff chains. Weak and strong central limit problems in the case of dependence.
267. Advanced Theory of the χ^2 Test. (3) II. Mr. LeCam
 Prerequisite: course 260A.
 Generalized theorem of Laplace. Tests equivalent in the limit. Various aspects of the χ^2 test. Best asymptotically normal estimates.

* Not to be given, 1953-1954.

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-280D. Laboratory Course in Advanced Statistical Inference. (1 or 2; 1 or 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 instructor.

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. Cramér, Mr. Loève
I. Mr. Cramér; II. Mr. Loève.

290Q. Structure of Stochastic Processes. (2-6) II. Mr. Bochner

Prerequisite: consent of instructor.

The role of partial ordering in stochastic theories. Differences between random point functions and random set functions. Fourier analysis of time series.

290S. Statistical Seminar. (2-6) I and II. Mr. Neyman in charge

290W. Seminar on Statistical Problems in Economics and Agricultural Economics. (2-4) I. Mr. Kuznets

Prerequisite: consent of instructor.

Statistical problems in the measurement of economic magnitudes and relations. Correlation and regression studies. Current research.

295S. Individual Research Leading to Higher Degrees. (2-6) I and II. The Staff (Mr. Neyman in charge)

Statistics Colloquium. (No credit) I and II. The Staff

Meetings for the presentation of original work by members of the staff and graduate students.

MEDICO-MILITARY SCIENCE AND TACTICS

A Department of the School of Medicine

Gerrit L. Hekhuis, Lt. Colonel, U.S.A.F., Medical Corps; *Associate Clinical Professor of Medico-Military Science and Tactics (Chairman of the Department)*.

Effective with the academic year 1953-1954, courses in Disaster Medicine will be offered in place of courses formerly called "Medico-Military Science and Tactics." Course 121A-121B, Disaster Medicine, is required of all first-year medical students. Courses 122A-122B, second year, and 123A-123B, third year, will be given at the School of Medicine in San Francisco. For the year 1953-1954 only, Medico-Military Science and Tactics 124A-124B will be offered for fourth-year medical students. For further information concerning the courses in Disaster Medicine, consult Dr. John B. Lagen, Associate Dean of the School of Medicine in San Francisco. Concerning the fourth-year course

in Medico-Military Science and Tactics consult the Professor of Medico-Military Science and Tactics at the Medical Center in San Francisco.

121A-121B. Disaster Medicine (First Year). (1-1) Yr.

Mr. Hekhuis

Outline of disaster preparedness plans and civil defense measures with emphasis on Campus Disaster Plan. Emphasis is on first aid, including bandaging and splinting; also transportation of wounded. Introduction to medical and surgical emergencies.

MILITARY SCIENCE AND TACTICS

(Department Office, 149 Gymnasium for Men)

Thomas L. Waters, Colonel, Artillery; *Professor of Military Science and Tactics (Chairman of the Department)*.

Harold S. Hayward, Lieutenant Colonel, Military Police Corps; *Associate Professor of Military Science and Tactics*.

Arthur J. Hoeman, Lieutenant Colonel, Ordnance Corps; *Associate Professor of Military Science and Tactics*.

Clifton S. Lindsey, Lieutenant Colonel, Corps of Engineers; *Associate Professor of Military Science and Tactics*.

Thomas C. Malone, Lieutenant Colonel, Artillery; *Associate Professor of Military Science and Tactics*.

Frederic H. Palmblad, Lieutenant Colonel, Signal Corps; *Associate Professor of Military Science and Tactics*.

Glyn W. Pohl, Lieutenant Colonel, Infantry; *Associate Professor of Military Science and Tactics*.

Marshall C. Preston, Lieutenant Colonel, Quartermaster Corps; *Associate Professor of Military Science and Tactics*.

Wenzel D. Roth, Lieutenant Colonel, Transportation Corps; *Associate Professor of Military Science and Tactics*.

Wilford B. Gratrik, Major, Ordnance Corps; *Associate Professor of Military Science and Tactics*.

Vaughn R. Moss, Major, Artillery; *Associate Professor of Military Science and Tactics*.

Glenn W. Pape, Major, Transportation Corps; *Associate Professor of Military Science and Tactics*.

Michael J. Di Salvo, Captain, Artillery; *Assistant Professor of Military Science and Tactics*.

Thomas W. Essen, Captain, Corps of Engineers; *Assistant Professor of Military Science and Tactics*.

Stephan J. Guss, Jr., Captain, Quartermaster Corps; *Assistant Professor of Military Science and Tactics*.

Walter W. MacDonald, Captain, Ordnance Corps; *Assistant Professor of Military Science and Tactics*.

Kenneth M. Moore, Jr., Captain, Corps of Engineers; *Assistant Professor of Military Science and Tactics*.

William H. Schultz, Captain, Military Police Corps; *Assistant Professor of Military Science and Tactics*.

Robert H. Singer, Captain, Artillery; *Assistant Professor of Military Science and Tactics*.

Bruce I. Staser, Captain, Infantry; *Assistant Professor of Military Science and Tactics.*

Clarence E. Wolfinger, Jr., Captain, Infantry; *Assistant Professor of Military Science and Tactics.*

William F. Magill III, First Lieutenant, Infantry; *Instructor in Military Science and Tactics.*

John E. Steinke, First Lieutenant, Signal Corps; *Instructor in Military Science and Tactics.*

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 three 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.

The A part of a course is not a prerequisite for the B part of a course in either basic or advanced Military Science and Tactics courses.

- 1A. Basic (First Year). (2) I. The Staff (Mr. Malone in charge)
Leadership, drill, and exercise of command; military organization; military problems of the United States; first aid and hygiene; tactics of the rifle squad, combat formations.
- 1B. Basic (First Year) (2) II. The Staff (Mr. Malone in charge)
Leadership, drill, and exercise of command; maps and aerial photographs; individual weapons and marksmanship.
- 20A. Basic (Second Year). Infantry. (2) I. Mr. Wolfinger
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. Wolfinger
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. Moore
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. Moore
 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; organization and mission of the Signal Corps; basic wire communications.
- 23B. Basic (Second Year). Signal Corps. (2) II. Mr. Palmblad
 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. Di Salvo
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; characteristics, capabilities, and limitations of AA automatic weapons; service of the piece AA automatic weapons; aerial photograph reading.
- 24B. Basic (Second Year). Artillery. (2) II. Mr. Di Salvo
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; introduction to AA guns; characteristics, capabilities, and limitations of AA guns; service of the piece AA guns; introduction to field artillery.
- 25A. Basic (Second Year). Ordnance Corps. (2) I. Mr. MacDonald
 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. MacDonald
 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. Preston
 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. Mr. Preston
 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. Roth
 Prerequisite: courses 1A, 1B, or their equivalent.
 Leadership, drill, and exercise of command; functions and mission of the Transportation Corps; development of commercial transportation; organization and operation of railroads in the United States.

- 27B. Basic (Second Year). Transportation Corps. (2) II. Mr. Roth
Prerequisite: courses 1A, 1B, or their equivalent.
Leadership, drill, and exercise of command; convoy operations and motor marches; air landed operations; security and defensive measures.
- 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 organizations and functions; military law.
- 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; individual weapons to include characteristics and operation; town and train patrolling; communications.

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 institution, unless he is excused from this requirement by authority of the Secretary of the Army.

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). (3) I. Mr. Magill

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. Magill

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. Essen

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; vehicle operations and maintenance; barrier planning; technique of rifle fire.

132B. Advanced Corps of Engineers (First Year). (3) II. Mr. Essen

Prerequisite: courses 22A, 22B, or their equivalent.

Leadership, drill, and exercise of command; tactics of engineer units; water supply; bridge design and classification; military teaching methods; weapons and marksmanship.

133A. Advanced Signal Corps (First Year). (3) I. Mr. Steinke

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; communications center security; message center procedure.

- 133B. Advanced Signal Corps (First Year). (3) II. Mr. Steinke
Prerequisite: courses 23A, 23B, or their equivalent.
Leadership, drill, and exercise of command; the fundamentals of military radio field communications; signal orders and documents; career guidance program for Signal Corps officers; individual weapons and marksmanship; applied signal communications; weapons and marksmanship.
- 134A. Advanced Artillery (AA) (First Year). (3) I. Mr. Singer
Prerequisite: courses 24A, 24B, or their equivalent.
Leadership, drill, and exercise of command; organization of Artillery basic AA gunnery; field artillery tactics.
- 134B. Advanced Artillery (AA) (First Year). (3) II. Mr. Singer
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; map reading.
- 135A. Advanced Ordnance Corps (First Year). (3) I. Mr. Hoeman
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 Corps (First Year). (3) II. Mr. Hoeman
Prerequisite: courses 25A, 25B, or their equivalent.
Leadership, drill, and exercise of command; artillery matériel; fire control matériel; automotive matériel; functional organization of the Ordnance Corps; tactics of the rifle squad.
- 136A. Advanced Quartermaster Corps (First Year). (3) I. Mr. Guss
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. Guss
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; tactics of the rifle squad.
- 137A. Advanced Transportation Corps (First Year). (3) I. Mr. Pape
Prerequisite: courses 27A, 27B, or their equivalent.
Leadership, drill, and exercise of command; port and beach operations; highway transportation units; supply and property; amphibious operations; military railway organization.
- 137B. Advanced Transportation Corps (First Year). (3) II. Mr. Pape
Prerequisite: courses 27A, 27B, or their equivalent.
Leadership, drill, and exercise of command; stevedoring; harborcraft and marine maintenance; highway operations in overseas theaters; weapons and marksmanship; military ports; tactics of rifle platoons and companies; Army aviation units.

- 138A. Advanced Military Police Corps (First Year). (3) I. Mr. Schultz
 Prerequisite: courses 28A, 28B, or their equivalent.
 Leadership, drill, and exercise of command; individual weapons and marksmanship; criminal investigation I; domestic disturbances; guard-houses and confinement facilities; small unit tactics; vehicles and troop movements; safety program.
- 138B. Advanced Military Police Corps (First Year). (3) II. Mr. Schultz
 Prerequisite: courses 28A, 28B, or their equivalent.
 Leadership, drill, and exercise of command; protection of vital installations; town patrolling; traffic control I; individual weapons and marksmanship; police administration; map reading.
- 140A. Advanced Infantry (Second Year). (3) I. Mr. Staser
 Prerequisite: courses 130A and 130B.
 Leadership, drill, and exercise of command; organization; command and staff; military administration; psychological warfare; military teaching methods; new developments; motors and transportation; communications procedures.
- 140B. Advanced Infantry (Second Year). (3) II. Mr. Staser
 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. Lindsey
 Prerequisite: courses 132A and 132B.
 Leadership, drill, and exercise of command; military administration; psychological warfare; command and staff; motor movements; engineer support for army; communications zone; combat intelligence.
- 142B. Advanced Corps of Engineers (Second Year). (3) II. Mr. Lindsey
 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 communications and equipment; Signal Corps operations and administrative procedures at military camps, posts, and stations; military law; career guidance program for Signal Corps officers; geographical foundations of national power.
- 144A. Advanced Artillery (AA) (Second Year). (3) I. Mr. Moss
 Prerequisite: courses 134A and 134B.
 Leadership, drill, and exercise of command; military teaching methods and administration; psychological warfare; AA tactics, advanced; supply and evacuation; map reading; field artillery tactics.

- 144B. Advanced Artillery (AA) (Second Year). (3) II. Mr. Moss
Prerequisite: courses 134A and 134B.
Leadership, drill, and exercise of command; military law; AA matériel; military team; command and staff; new developments; combat intelligence; geographical foundations of national power; AA gunnery.
- 145A. Advanced Ordnance Corps (Second Year). (3) I. Mr. Gratricks
Prerequisite: courses 135A and 135B.
Leadership, drill, and exercise of command; military teaching methods; military administration; psychological warfare; maintenance and supply; command and staff; combat intelligence.
- 145B. Advanced Ordnance Corps (Second Year). (3) II. Mr. Gratricks
Prerequisite: courses 135A and 135B.
Leadership, drill, and exercise of command; military law and boards; matériel specialty; geographical foundations of national power; guided missiles.
- 146A. Advanced Quartermaster Corps (Second Year). (3) I. Mr. Preston
Prerequisite: courses 136A and 136B.
Leadership, drill, and exercise of command; military administration; military teaching methods; psychological warfare; quartermaster operations in the zone of the interior; quartermaster operations in the theater of operations.
- 146B. Advanced Quartermaster Corps (Second Year). (3) II. Mr. Preston
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. Roth
Prerequisite: courses 137A and 137B.
Leadership, drill, and exercise of command; rail operations in theaters of operations; logistics and overseas supply; military administration; teaching methods; psychological warfare; communications; combat and transportation intelligence; transportation service in a theater of operations.
- 147B. Advanced Transportation Corps (Second Year). (3) II. Mr. Roth
Prerequisite: courses 137A and 137B.
Leadership, drill, and exercise of command; command and staff functions; military law; movements control; geographical foundations of national power; the installation transportation officer; the Transportation Corps officer.
- 148A. Advanced Military Police Corps (Second Year). (3) I. Mr. Hayward
Prerequisite: courses 138A and 138B.
Leadership, drill, and exercise of command; military administration; psychological warfare; military teaching methods; guerrilla warfare; map and aerial photograph reading; control of individuals in the field; prisoners of war; division.

148B. Advanced Military Police Corps (Second Year). (3) II. Mr. Hayward
Prerequisite: courses 138A and 138B.

Leadership, drill, and exercise of command; military law and boards; the military team; supply and evacuation; military government; combat intelligence; geographical foundations of national power; organization and staff.

MUSIC

(Department Office, 215 Music Building)

† Manfred F. Bukofzer, Ph.D., *Professor of Music.*

Charles C. Cushing, M.A., *Professor of Music.*

Edward B. Lawton, Jr., A.B., *Professor of Music.*

Joaquin Nin-Culmell, Diplôme de fin d'Etudes, Schola Cantorum; Premier Accessit de Composition Musicale, Conservatoire National, Paris, *Professor of Music (Chairman of the Department).*

Ernest Bloch, *Professor of Music, Emeritus.*

Albert I. Elkus, M.L., *Professor of Music, Emeritus.*

David D. Boyden, M.A., *Associate Professor of Music.*

¹ William D. Denny, M.A., *Associate Professor of Music.*

Winifred B. Howe, M.A., *Assistant Professor of Music.*

* Andrew W. Imbrie, M.A., *Assistant Professor of Music.*

Joseph Kerman, Ph.D., *Assistant Professor of Music.*

Edgar H. Sparks, Ph.D., *Assistant Professor of Music.*

Seymour Shifrin, M.A., *Instructor in Music.*

William O. Smith, M.A., *Acting Instructor in Music.*

Margaret Cartwright, A.B., *Associate in Music.*

Mary Groom Jones, *Associate in Music.*

Reginald Krieger, A.B., *Associate in Music.*

Ernest Kubitschek, *Associate in Music.*

George H. Kyme, M.A., *Associate in Music and Supervisor of the Teaching of Music.*

Frances Moulthrop, A.B., *Associate in Music.*

Abe Sherman, A.B., *Associate in Music.*



THE GRILLER QUARTET of the University of California:

Sidney Griller, C.B.E., F.R.A.M., *Lecturer in Music.*

Jack O'Brien, F.R.A.M., *Lecturer in Music.*

Philip Burton, F.R.A.M., *Lecturer in Music.*

Colin Hampton, F.R.A.M., *Lecturer in Music.*



Madi Bacon, M.A., *Lecturer in Music.*

James Berdahl, M.A., *Lecturer in Music and Band Leader.*

Vincent H. Duckles, Ph.D., *Lecturer in Music Bibliography.*

Marjorie Gear Petray, A.B., *Lecturer in Music.*

* Absent on leave, 1953-1954.

† Sabbatical leave in residence, fall semester; absent on leave, spring semester, 1953-1954.

¹ In residence fall semester only, 1953-1954.

Letters and Science List.—All undergraduate courses are included in the Letters and Science List of Courses; a total of not more than 8 units from courses 43, 48, 143, and 148 will be accepted as Letters and Science credit. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Denny, fall semester; Mr. Cushing, spring semester.

Preparation for the Major.—Required: Freshman year: I, Music A, 2; II, Music 1A, 3A; Sophomore year: I, Music 3B, 21A; II, Music 4, 21B; I or II, Music 1B. Entering students who plan to major in music should confer with Miss Howe. 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 group performance.

The 24 units required for the major are to be distributed among upper division courses according to the following plan:

I. *Theory.*—At least two of the following courses: 104A, 104B, 105A, 105B, 106A, 106B, either 107A or 107B, either 108 or 109.

II. *History and Literature.*—At least two of the following semester courses: 115, 116, 117, 118, 119, 122, 124.

III. *Performance.*—At least two of the following courses: 141, 143, 144, 145, 146, 148. Each of these courses may be repeated once without duplication of credit. The requirement may be satisfied by repeating the same course.

IV. Courses 100, 101.

Students are advised to acquire facility in reading French, German, or Italian. In addition, the department recommends as supplementary choices among free electives: Philosophy 136A-136B and other related courses in the fields of anthropology, architecture, art, English, history, philosophy, speech, and foreign 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 section concerning study-list regulations in the CIRCULAR OF INFORMATION.

Students who fail to maintain an average of one grade point for each unit of work undertaken in the upper division in the Department of Music will, upon approval of the Executive Committee of the College of Letters and Science, be excluded from the major in music.

Honor Students in the Upper Division.—Students in the honors group who have completed the major in music with distinction may receive honors at graduation.

Teacher-Training.—Adviser: Mr. Sparks. Candidates for the General Secondary Credential, after receiving the A.B. degree, must spend two graduate semesters at this University; the teaching major, normally completed by the end of this period, specifically requires: (a) Two courses chosen from 104A, 104B, 107A, or 107B. (b) Courses 108, 111, 435A-435B. (c) Four units chosen from 141, 143, 144, 146, 148, two units of which must be in 144. Only one unit of 148 may apply. (d) Ability in piano equivalent to that attained in four semesters of courses 327A, 327B, 327C, 327D and competence in either

voice or one orchestral or band instrument, and nine units from 328A, 328B, 329A, 329B, 329C, 329D, 329E. At the discretion of the adviser portions of this work may be taken by examination. Students without previous experience in playing an orchestral or band instrument are urged to undertake work in the 329 courses as soon as possible, preferably in the lower division. Credit of 3 to 5 units in the teaching methods courses will satisfy the requirement of elective units in education. For further information, including grade-point requirements, see the ANNOUNCEMENT OF THE SCHOOL OF EDUCATION.

Beginning with the fall semester of 1953 the candidate for practice teaching in instrumental music must demonstrate ability in performance on strings, brass, and woodwinds equivalent to that which he would attain from two semesters of course 329A and one semester each of courses 329B, 329C, 329D.

Higher Degrees.—Advisers: M.A. degree, Mr. Boyden, Mr. Lawton; Ph.D. degree, Mr. Kerman. See also the ANNOUNCEMENT OF THE GRADUATE DIVISION, NORTHERN SECTION, and the special announcements issued by the department concerning the M.A. and Ph.D. degrees.

GROUP I

Courses open to all students in the University.

LOWER DIVISION COURSES

10. Basic Musicianship. (2) I and II.

Miss Bacon (in charge), Miss Moulthrop

Prerequisite: course 27A or consent of the instructor.

Fundamentals of music with singing, ear training, and conducting.

27A-27B. Introduction to Musical Literature. (3-3) Yr.

27A: I and II; 27B: II.

Mr. Lawton, Mr. Sparks

Two lectures and one section meeting per week.

Course 27A or consent of the instructor is prerequisite to course 27B.

Lectures, illustrations, and readings designed to furnish a general appreciation of music. Weekly section meetings for listening, discussion, and written work.

Performance

Audition for enrollment in any performance course will be required during the period of registration. Further information may be obtained from the Department of Music.

All courses in this group may be repeated once without duplication of credit.

41. University Symphony Orchestra. (2) I and II.

Mr. Nin-Culmell

Two two-hour rehearsals per week.

43. University Concert Band. (2) II.

Mr. Berdahl

Two hour-and-a-half rehearsals and one section hour per week.

44. University Chorus. (2) I and II.

Mr. Lawton

Two hour-and-a-half rehearsals and one section hour per week.

46. Chamber Music Ensemble. (2) I and II.

The Griller Quartet (Mr. Griller in charge)

Four class hours per week.

Study and interpretation of chamber music for strings and for strings and piano.

48. Piano Ensemble. (1) I and II.

Mrs. Petray

Two class hours per week.

Study and interpretation of four- and eight-hand piano literature.

UPPER DIVISION COURSES

- 127A. Introduction to Opera. (3) I. Mr. Kerman
Prerequisite: course 27A-27B, or consent of instructor.
Critical study of seven operas, such as *Dido and Aeneas*, Gluck's *Orfeo*, *Don Giovanni*, *Fidelio*, *Tristan*, *Otello*, *Pelléas*, and *Wozzeck*, emphasizing the contributions of music to a total dramatic effect.
- 127B. The Symphonies of Beethoven. (3) II. Mr. Kerman
Prerequisite: course 27A-27B, or consent of instructor.
Study of the nine symphonies, showing the development of Beethoven's style by means of lectures, listening, and reference to selected non-symphonic works.

Performance

For particulars see lower division performance courses.

All courses in this group may be repeated once without duplication of credit.

141. Advanced University Symphony Orchestra. (2) I and II. Mr. Nin-Culmell
Prerequisite: 4 units in course 41.
143. Advanced University Concert Band. (2) II. Mr. Berdahl
Prerequisite: 4 units in course 43.
144. Advanced University Chorus. (2) I and II. Mr. Lawton
Prerequisite: 4 units in course 44.
145. Repertory Chorus. (2) I and II. Mr. Lawton
Prerequisite: 4 units in course 144 or equivalent and consent of instructor. Enrollment limited to thirty-two students.
146. Advanced Chamber Music Ensemble. (2) I and II. The Griller Quartet (Mr. Griller in charge)
Prerequisite: 4 units in course 46.
148. Advanced Piano Ensemble. (1) I and II. Mrs. Petray

PROFESSIONAL COURSES

Each of these courses may be repeated for credit.

- 445E. Woodwind Ensemble. ($\frac{1}{2}$) I and II. Mr. Kubitschek
Prerequisite: course 329C or consent of instructor.
- 455E. Brass Ensemble. ($\frac{1}{2}$) I and II. Mr. Krieger
Prerequisite: course 329B or consent of instructor.

GROUP II

Courses primarily for students whose major subject is Music.

LOWER DIVISION COURSES

- A. Musicianship. (2) I.
Mrs. Petray (in charge), Mr. Sherman, Mr. Shifrin, Mr. Smith
Elements of music, with ear training, sight singing, and dictation.
- 1A. Musicianship. (2) II.
Mrs. Petray (in charge), Mr. Sherman, Mr. Shifrin, Mr. Smith
A continuation of course A, which is prerequisite.

- 1B. Musicianship. (2) I and II. Mrs. Petray
A continuation of course 1A, which is prerequisite.
2. Elementary Counterpoint. (3) I. Mr. Cushing (in charge), Mr. Denny, Mr. Smith
Prerequisite: course A (may be taken concurrently) or consent of instructor.
Sixteenth-century polyphony: theory and practice. Preparatory exercises and motet writing.
- 3A. Elementary Harmony. (3) II. Mr. Boyden (in charge), Mr. Smith
Prerequisite: course 2; course 1A (may be taken concurrently) or consent of instructor.
- 3B. Intermediate Harmony. (3) I. Miss Howe, Mr. Shifrin
A continuation of course 3A, which is prerequisite.
4. Intermediate Counterpoint and Harmony. (3) II. Miss Howe, Mr. Shifrin
Prerequisite: course 3B.
- 21A-21B. History and Literature of Music. (3-3) Yr. Mr. Boyden
Prerequisite: courses 2 and 3A, or consent of instructor.
Three lectures and one section meeting per week.
A study of the development of music from antiquity to the present; lectures, listening, technical analysis, and written reports.

UPPER DIVISION COURSES

Theory

Students should take courses 100 and 101 in the junior year.

100. Keyboard Harmony. (2) I. Mr. Denny, Miss Howe
Prerequisite: course 4.
The reading of figured bass; sequences, modulations, etc., in the harmonic vocabulary of the eighteenth and nineteenth centuries.
101. Score Reading. (2) II. Miss Howe, Mr. Sparks
Prerequisite: course 100.
- 104A-104B. Advanced Counterpoint and Harmony. (3-3) Yr. Mr. Cushing
Prerequisite: courses 2 and 4.
- 105A-105B. Principles of Composition. (3-3) Yr. Mr. Shifrin
Prerequisite: course 104A-104B.
- 106A-*106B. Canon and Fugue. (3-3) Yr. Mr. Denny
Prerequisite: course 104A-104B.
- 107A-107B. Studies in Musical Analysis. (3-3) Yr. Miss Howe
Prerequisite: course 4.
108. Instrumentation. (3) II. Mr. Smith
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.

* Not to be given, 1953-1954.

111. Band Instrumentation. (2) II. Mr. Berdahl
 Prerequisite: courses 101 and 108.
 A study of the instruments of the band; practice in scoring for selected wind instruments and for concert band.

History and Literature

Courses in this group will be given in rotation: renaissance, baroque, classic, romantic, modern. Prerequisite: course 21A-21B or consent of the instructor.

Renaissance Period (1490-1600)

- *115A. Survey of Renaissance Music. (3) I. Mr. Kerman

Baroque Period (1600-1750)

- 116A. Survey of Baroque Music. (3) I. Mr. Boyden
 A survey of musical literature from Monteverdi to Handel and J. S. Bach.

- *116E. The Performance of Baroque Music. (3) I. Mr. Boyden
 Prerequisite: experience in playing an instrument or in singing, and a reading knowledge of French, German, or Italian.

Classic Period (1750-1827)

- 117A. Survey of Classic Music. (3) II. Mr. Kerman
 The music of the early classic schools and of Haydn, Mozart, and Beethoven.

- *117B. The Operas of Mozart. (3) II. Mr. Bukofzer

- *117C. The String Quartets of Beethoven. (3) II. Mr. Sparks

- *117D. The Chamber Music of Mozart. (3) I. Mr. Boyden

Romantic Period (1820-1900)

- *118A. Survey of Romantic Music. (3) I. Mr. Bukofzer
 From Weber and Schubert to the end of the nineteenth century.

- *118B. The Operas of Verdi. (3) I. Mr. Bukofzer

- 118C. The Songs of Schubert. (3) I. Mr. Kerman
 Study of the songs will be related to Schubert's work as a whole and to the development of song composition from Mozart to Strauss and Debussy.

Modern Period (1900-)

- *119A. Survey of Modern Music. (3) II. Mr. Imbrie

- 119C. Modern French Music. (3) II. Mr. Cushing
 Critical and analytical studies of selected works of French composers from 1870 to the present, with special reference to Fauré, Debussy, and Ravel.

- *119D. Chamber Music of the Twentieth Century. (3) II. Mr. Imbrie
 A critical and analytical study of works by Milhaud, Stravinsky, Bartók, Sessions, and Schönberg.

* Not to be given, 1953-1954.

Forms and Mediums

- *122A. History of Opera: Baroque and Classic. (3) I. Mr. Bukofzer
 *122B. History of Opera: Romantic and Modern. (3) II. Mr. Bukofzer
 *124. Violin Music of the Seventeenth and Eighteenth Centuries. (3) II.

Mr. Boyden

The sonata and concerto repertory will be emphasized. Representative composers: Marini, Biber, Corelli, Vivaldi, Bach, Leclair, Tartini, Gaviniés, Mozart, and Viotti.

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. Boyden in charge)

GRADUATE COURSES

Consent of the instructor must be obtained before enrollment in any graduate course. For further conditions concerning admission to graduate courses, see page 10.

200. Fundamentals of Music Bibliography. (2) I. Mr. Duckles
 *201. Seminar: Studies in Orchestration. (2) 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
 203B. Free Composition. (2) I and II. Mr. Nin-Culmell
 *203C. Advanced Composition. (2-4) I and II.
 Prerequisite: courses 105A-105B, 106A-106B, or 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) I. Mr. Lawton
 *210A-210B: Seminar in Mensural Notation. (3-3) Yr. Mr. Sparks
 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.
 213A-213B. Seminar: Music of the Renaissance. (3-3) Yr. Mr. Kerman
 214A-214B. Seminar: The Sonata in the Nineteenth Century. (3-3) Yr.
 Mr. Sparks
 *215A-215B. Seminar: Research in Music History. (3-3) Yr. Mr. Bukofzer
 Prerequisite: course 200.
 The topic for 1954-1955 is: reading of musical theorists.
 Topics to be considered in following years are: principles of musical structure from the Gregorian period to the present; the concerto from the Baroque period to the present; the history of dissonance treatment.

* Not to be given, 1953-1954.

250. Seminar in the Technique of Musicological Research. (2-4) I and II.
Mr. Bukofzer, Mr. Sparks
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. Kerman in charge)
Open to properly qualified graduate students for research or creative
work. Such work shall not serve in lieu of regular courses of instruction.

TEACHING METHODS COURSES†

Courses 327A, 327B, 327C, 327D are designed to satisfy the requirements in piano for the General Secondary Credential.

- 327A-327B. Elementary Piano. (1-1) Yr. Mrs. Petray
- *327C-327D. Intermediate Piano. (1-1) Yr. Mrs. Petray
Prerequisite: course 327B or consent of instructor.
- 328A-328B. Vocal Technique and Methods of Teaching Voice. (2-2) Yr.
Prerequisite: course 100. Mrs. Jones
Principles of vocal and choral technique; voice-testing; care of adolescent voices; transposition; evaluation of teaching materials.
May be repeated once without duplication of credit.
329. Instrumental Methods. Mr. Berdahl, Mr. Krieger, Mr. Kyme
- 329A. Stringed Instruments. (1) I and II. Mr. Kyme
- 329B. Brass Instruments. (1) I. Mr. Berdahl
- 329C. Woodwind Instruments. (1) II. Mr. Berdahl
- 329D. Percussion Instruments. (1) I. Mr. Krieger
- 329E. Ensemble: Literature for School Orchestra and Band. (1) II. Mr. Krieger
- Methods of teaching orchestra and band instruments; repertory and program planning for Secondary Schools. Each course may be repeated once without duplication of credit.

PROFESSIONAL COURSE

- 435A-435B. Conducting. (2-2) Yr. Mr. Boyden, Miss Cartwright
- 435A. Choral Conducting; Miss Cartwright.
- 435B. Orchestral Conducting; Mr. Boyden.
- Prerequisite: course 101 and 108 (may be taken concurrently).
Not open to juniors.

NAVAL SCIENCE

(Department Office, 51 Gymnasium for Men)

- Donald McGregor, Captain, U.S.N.; *Professor of Naval Science (Chairman of the Department)*.
- William C. Meyer, Commander, U.S.N.; *Associate Professor of Naval Science*.
- Charles A. Coutts, Lieutenant Commander, U.S.N.R.; *Associate Professor of Naval Science*.
- Samuel L. Eddy, Captain, U.S.M.C.; *Assistant Professor of Naval Science*.

* Not to be given, 1953-1954.

† See ANNOUNCEMENT OF THE SCHOOL OF EDUCATION, BERKELEY.

Robert H. Madden, Lieutenant, SC, U.S.N.; *Assistant Professor of Naval Science.*

Mortimer Stevens, Lieutenant, U.S.N.; *Assistant Professor of Naval Science.*

Paul L. Henkels, Lieutenant (j.g.), U.S.N., *Assistant Professor of Naval Science.*

Courses in this department are normally restricted to students who are regularly enrolled members of the Naval Reserve Officers' Training Corps. Details concerning enrollment are available in Room 47, Gymnasium for Men, Office of the Department of Naval Science. Candidates must be able to complete all requirements of the Naval R.O.T.C. curriculum, without 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. Mr. Henkels
Naval history, functions and organization, and the characteristics of naval ships.
- 1B. Naval Orientation, Part II. (3) II. Mr. Henkels
Survey of basis of naval justice and customs; elements of leadership; basic seamanship.
- 2A. Naval Weapons. (3) I. Mr. Stevens
Ammunition components, gun assemblies, major and intermediate caliber installations, machine guns, torpedoes, mines, depth charges, rockets, surface fire control.
- 2B. Naval Fire Control. (3) II. Mr. Stevens
Prerequisite: course 2A.
Antiaircraft fire control systems, naval electronics equipment, CIC operations, torpedo control, spotting, shore bombardment, guided missiles.

UPPER DIVISION COURSES

- 101A. Navigation; Piloting. (3) I. Mr. 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. _____
Naval boilers and auxiliaries; naval steam turbines; naval Diesel engines; aircraft engines.
- 102B. Damage Control and Naval Officer Orientation. (3) II. _____
Ship's stability. The last half of this course is designed to prepare the student for his first assignment afloat, and includes naval justice and leadership.
- 103M. Evolution of the Art of War. (3) I. Mr. Eddy
Survey of the historical development of weapons, tactics, and material and illustrates the classic principles of war by a study of selected battles and campaigns.

- 104M. Basic Strategy and Tactics. (3) II. Mr. Eddy
Designed to survey modern strategical and tactical principles, using contemporary historical events as illustrative material.
- 105M. Amphibious Warfare. (3) I. Mr. Eddy
Broad introduction to the specialized field of amphibious warfare by a limited treatment of the factors pertaining to its planning and execution. Open to members of the Armed Forces only.
- 106M. Amphibious Warfare and Naval Officer Orientation. (3) II. Mr. Eddy
Examination of certain amphibious operations of World War II. The last half of this course is designed to prepare the student for his first active duty and includes Naval Justice and Leadership. Open to members of the Armed Forces only.
- 107S. Naval Finance and Accounting. (3) I. Mr. Madden
Open to junior students only.
Supply Corps organization; naval funds and appropriations; property appropriation and cost accounting ashore.
- 108S. Supply Afloat. (3) II. Mr. Madden
Prerequisite: course 107S.
The Navy Supply system; organization and operation of the Supply Department afloat; basic accounting afloat.
- 109S. Supply Ashore. (3) I. Mr. Madden
Open to senior students only.
Supply Corps organization, operation and accounting ashore.
- 110S. Supply Afloat. (3) II. Mr. Madden
Prerequisite: course 109S.
Supply Corps organization, operation and accounting afloat.

NEAR EASTERN LANGUAGES

(Department Office, 421A Library)

Walter J. Fischel, Ph.D., *Professor of Semitic Languages and Literature*
(*Chairman of the Department of Near Eastern Languages*).

Henry L. F. Lutz, Ph.D., D.D., *Professor of Egyptology and Assyriology*.

William Popper, Ph.D., LL.D., *Professor of Semitic Languages, Emeritus*.

Jørgen Laessøe, Ph.D., *Acting Assistant Professor of Assyriology*.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Fischel.

Preparation for the Major.—Course 21A-21B; a reading knowledge of French and German.

The Major.—Required: 24 units, of which 16 units must be in upper division language courses in the Department of Near Eastern Languages and at least 6 units of lecture courses in the department.

Year courses begin in the fall semester only.

Courses in History and Religion

Elective courses not requiring a knowledge of any Near Eastern Language.

- 100A-100B. The Ancient Near East. (3-3) Yr. Mr. Lutz
(Formerly numbered 13A-13B.)
The rise of civilization in the Nile valley, Mesopotamia and adjacent areas from the Paleolithic Age to the Roman period.
- 102A-102B. Religion and Mythology of Egypt, Babylonia and Assyria. (3-3) Yr. Mr. Laessøe
Prerequisite: course 100A-100B or 125.
- 105A-105B. Introduction to Babylonian Literature. (2-2) Yr. Mr. Laessøe
A survey of the major literary contributions of the Sumerians, Babylonians, and Assyrians to world culture.
- 110A-110B. Great Books of Near Eastern Literature. (1-1) Yr. Mr. Fischel
110A: Great Books of Hebrew Literature. A survey of Hebrew classics, covering post-biblical, medieval and modern literature in various centers of the Orient and Europe.
110B: Great Books of Islamic Literature. A survey of the major poetical, historical and philosophical masterpieces of Arabic, Persian and Turkish literature from the rise of Islam until modern times.
125. Islamic Civilization. (2) I. Mr. Fischel
(Formerly numbered 25.)
A survey of the rise and development of the Mohammedan civilization and its institutions; the background for the understanding of the modern Islamic world in Asia and Africa.
130. Hebrew Civilization. (2) II. Mr. Fischel
A survey of the development of Hebrew civilization in various centers of the Jewish dispersion, including Babylonia, Spain and North Africa, Eastern and Western Europe and Israel.

Language Courses

The specific courses given in any year, the hours thereof, and the authors read will depend on the needs of the students; 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 and is required of all majors in the department.

- 21A-21B. Elementary Hebrew. (4-4) Yr. Mr. Fischel in charge
Biblical Hebrew grammar and reading.
- 121A-121B. Intermediate Hebrew. (2-2) Yr. Mr. Fischel in charge
Reading and grammatical analysis of selections from the historical books of the Old Testament such as Joshua, Samuel, Kings or Ruth.
- 122A-122B. Modern Hebrew. (2-2) Yr. Mr. Fischel
Prerequisite: course 21A-21B or equivalent.
Reading and grammatical study of modern Hebrew literature.
- 131A-131B. Elementary Arabic. (4-4) Yr. Mr. Fischel in charge
Classical Arabic grammar and reading.

- 132A-132B. Intermediate Arabic. (2-2) Yr. Mr. Fischel
Prerequisite: course 131A-131B.
Selections from (A) Historical works; (B) The Thousand and One
Nights.
- 140A-140B. Elementary Modern Persian. (2-2) Yr. Mr. Fischel
Prerequisite: course 131A-131B.
Grammar and reading.
- 141A-141B. Elementary Syriac (Aramaic). (2-2) Yr. Mr. Fischel
Elements of Biblical Aramaic or classical Syriac designed to meet the
needs of major students.
- 151A-151B. Elementary Assyrian. (3-3) Yr. Mr. Laessøe
- 152A-152B. Elementary Sumerian. (2-2) Yr. Mr. 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. Fischel

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 224A-224B. Advanced Biblical Hebrew. (2-2) Yr. Mr. Fischel
Prerequisite: course 121A-121B.
Reading and grammatical analysis of prophetic or poetical books of
the Bible such as Amos, Isaiah, Jeremiah or Psalms.
- 227A-227B. Post-Biblical Hebrew. (1-1) Yr. Mr. Fischel
Prerequisite: course 121A-121B or 122A-122B.
Reading of unvocalized post-biblical texts such as the Mishnah,
Midrash, Piyutim or modern Hebrew literature.
- 232A-232B. Advanced Arabic. (2-2) Yr. Mr. Fischel
Prerequisite: course 132A-132B.
Reading of the Koran, poetry or modern literary works.
- †241A-241B. Advanced Syriac (Aramaic). (2-2) Yr. Mr. Fischel
- †251A-251B. Advanced Assyro-Babylonian. (2-2) Yr. Mr. Laessøe
- †252A-252B. Advanced Sumerian. (2-2) Yr. Mr. 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. Fischel
- 290A-290B. Special Study. Yr. Mr. Laessøe, Mr. Fischel, Mr. Lutz
Credit according to work accomplished.

NURSING

(Department Office, 210 Building T-8)

Pearl Castile, R.N., Ed.D., *Associate Professor of Nursing.*

Jeannette S. Hiller, R.N., Ed.D., P.H.N., *Associate Professor of Nursing.*

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

- Alice E. Ingmire, R.N., Ed.D., *Associate Professor of Nursing.*
 Amy A. MacOwan, R.N., Ed.D., *Associate Professor of Public Health Nursing.*
 Margaret A. Tracy, R.N., M.S., *Associate Professor of Nursing (Chairman of the Department).*
 Hannah M. Binhammer, R.N., M.A., *Assistant Professor of Nursing.*
 Ethel H. Curtis, R.N., M.A., P.H.N., *Assistant Professor of Public Health Nursing.*
 Mary T. Harms, R.N., M.A., *Assistant Professor of Nursing.*
 Ann E. Hill, J.D., R.N., M.P.H., P.H.N., *Assistant Professor of Nursing.*
 Bernice C. Hudson, R.N., M.A., *Assistant Professor of Nursing.*
 Dorothy K. Loveland, R.N., M.A., *Assistant Professor of Nursing.*
 Leola R. McCormack, R.N., B.S., *Acting Assistant Professor of Nursing.*
 Lura M. Morse, Ph.D., *Assistant Professor of Home Economics.*
 Kathryn M. Smith, R.N., B.S., *Assistant Professor of Nursing.*
 Helen L. Allen, R.N., M.S., *Instructor in Surgical Nursing.*
 Mildred M. Buck, B.S., *Acting Instructor in Nursing.*
 Mary Sue Evitts, R.N., B.S., *Instructor in Obstetrical Nursing.*
 Dorothy C. Gunnell, R.N., M.S., *Instructor in Nursing.*
 Winifred H. Incerti, R.N., B.S., *Acting Instructor in Nursing.*
 Marion E. Kalkman, R.N., A.B., *Instructor in Psychiatric Nursing.*
 Ruth E. Nutting, R.N., M.S., *Instructor in Nursing.*
 Mary E. Mueller, M.A., *Associate in Home Economics.*



- Moses Grossman, M.D., *Instructor in Pediatrics.*
 Phylis Haley, Ph.D., *Lecturer in Educational Psychology.*
 John A. Kerner, M.D., *Clinical Instructor in Obstetrics and Gynecology.*
 William A. Kornhauser, Ph.D., *Instructor in Sociology and Social Institutions and Lecturer in Sociology, School of Nursing.*
 John B. Lagen, M.D., *Associate Professor of Medicine.*
 Ida M. Oswald, M.S.W., *Lecturer in Social Welfare.*
 Donald E. Pickering, M.D., *Instructor in Pediatrics.*
 A. Rodney Prestwood, M.D., *Clinical Instructor in Psychiatry.*
 Paul Sanazero, M.D., *Clinical Instructor in Medicine.*
 Alex C. Sherriffs, Ph.D., *Associate Professor of Psychology and Lecturer in Child Psychology, School of Nursing.*
 Tamotsu Shibutani, Ph.D., *Assistant Professor of Sociology and Social Institutions and Lecturer in Sociology, School of Nursing.*
 William W. Stiles, M.D., M.P.H., *Associate Professor of Public Health.*
 Frances A. Torrey, M.D., *Associate Clinical Professor of Dermatology.*



Olive E. Walkley, R.N., B.N., A.B., *Lecturer in Psychiatric Nursing.*

(GIVEN AT BERKELEY)

The following courses are open only to students eligible for enrollment in the curricula for graduate nurses.

PROFESSIONAL COURSES

416. Health Teaching. (3) I and II. Miss MacOwan
418. The Nurse in Public Health. (3) I and II. Mrs. Curtis
419. The Field of Public Health Nursing. (3) I and II. Miss MacOwan
Prerequisite: course 418 or consent of the instructor.
432. Principles of Nursing Education. (2) I. Miss McCormack
434. Principles of Ward Management and Teaching. (3) II.
Miss McCormack
Prerequisite: course 432 and Education 110; or consent of instructor.

GRADUATE COURSES

As a condition of enrollment in a graduate course, the student must have been admitted to the Graduate Division, Northern Section, and have completed 15 units of advanced work basic to the proposed major subjects for a higher degree; be certified by the Department of Nursing as to eligibility to complete the program; and satisfy professional requirements as established by the School of Nursing.

Specific prerequisites: (Academic) 5 units of education courses including Education 110, and 5 units of upper division social science courses including Social Welfare 100; (Professional) 6 units chosen from courses 416, 418, 419, 432, and 434.

NOTE. Any graduate course may be omitted if fewer than four students enroll.

200. Problems of Administration in Nursing. Seminar. (2) I. Miss Tracy
Basic material of study will be school surveys; national surveys and contributions to education in the field of administration.
201. Surveys in Nursing. (3) II. Miss Tracy
Lectures and laboratory.
Training in practical application of principles and techniques developed in school surveys, including additional field work equivalent to two hours per week.
202. Principles and Techniques of Supervision in Nursing. Seminar. (2) I.
Miss MacOwan
A consideration of the principles and techniques of supervision.
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.
Prerequisite: course 204. Miss MacOwan, Miss Castile
Designed especially for administrators, supervisors, and teachers who have problems in curriculum development.
206. Curriculum and Teaching Problems in Nursing. Practicum. (6) I.
Prerequisite: course 204. Miss Castile in charge
An opportunity for qualified students to work on practical curriculum and teaching problems under guidance.

207. Historical Foundations of Nursing. (3) II. Miss Allen
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. Mrs. Curtis, 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 Tracy and the Staff
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. Miss Kalkman
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. Mrs. Hiller
418. The Nurse in Public Health. (3) I. Mrs. Hiller
Parallels course 418 given at Berkeley.
- 418E. Community Nursing. (2) I and II. Mrs. Hiller
421. History of Nursing. (2) I and II. Miss Allen
423. Professional Adjustments. (1) I and II. Miss McCormack
425. Pathology. (1) I and II. _____
- 427A-427B. Pharmacology and Therapeutics. (2-1) Yr. 427A: I and II; 427B: II. Miss Binhammer, Mr. Lagen
- 435A. Nursing Arts. (5) I and II. Mrs. Ingmire, Miss Hudson, Mrs. Buck
- 440A. Introduction to Medicine. (2) II. Mr. Sanazero, Miss Torrey
- 440E. Medical Nursing. (2) I and II. Miss Binhammer
- 440F. Medical Nursing. (2) I and II. Miss Binhammer
- 441A. Introduction to Psychiatry. (1) II. Mr. Prestwood
- 441E. Psychiatric Nursing. (2) I and II. Miss Walkley
- 442A. Introduction to Surgery. (2½) II. _____
- 442E. Surgical Nursing. (2) I and II. Miss Loveland, Miss Harms

- 442F. Surgical Nursing. (2) I and II. Miss Loveland, Miss Harms
 444A. Introduction to Pediatrics. (2) II. _____
 444E. Pediatric and Communicable Disease Nursing. (2) I and II. Miss Smith
 446. Introduction to Communicable Diseases. (2) I and II. _____
 448A. Introduction to Obstetrics and Gynecology. (3) II. _____
 448E. Obstetrical and Gynecological Nursing. (2) I and II. Miss Evitts

UPPER DIVISION COURSES

EDUCATION

110. Introduction to Educational Psychology. (3) I and II. Miss Haley
 Parallels Education 110 given at Berkeley.

HOME ECONOMICS

104. Diet Therapy. (3) II. Miss Morse
 Prerequisite: Home Economics 111.
 111. Nutrition. (3) I and II. Miss Morse
 Parallels Home Economics 111 given at Berkeley.

PSYCHOLOGY

111. Child Psychology. (2) II. Mr. Sherriffs
 Parallels Psychology 111 given at Berkeley.

PUBLIC HEALTH

145. Community Control of the Communicable Diseases. (3) I. Mr. Stiles
 Parallels Public Health 145 given at Berkeley.

SOCIAL WELFARE

100. The Field of Social Welfare. (3) I and II. Mrs. Oswald
 Parallels Social Welfare 100 given at Berkeley.

SOCIOLOGY

160. The City. (3) I and II. Mr. Shibutani, Mr. Kornhauser

OCEANOGRAPHY*Marine Sciences*

Courses in oceanography leading to the master's or doctor's degree in oceanography and certain of the marine sciences are offered for a limited number of qualified students at the Scripps Institution of Oceanography at La Jolla, California. Detailed information concerning the courses may be found in the GENERAL CATALOGUE, DEPARTMENTS AT LOS ANGELES. For further information concerning the Institution refer to the Registrar of the University of California, 405 Hilgard Avenue, Los Angeles 24, or write to the Director of the Institution.

OPTOMETRY

(Department Office, 101 Optometry Building)

- Kenneth B. Stoddard, Ph.D., *Professor of Physiological Optics and Optometry (Chairman of the Department)*.
 Meredith W. Morgan, Jr., Ph.D., *Professor of Physiological Optics and Optometry*.
 Gordon L. Walls, Sc.D., *Professor of Physiological Optics and Optometry and Lecturer in Physiology*.

Ralph S. Minor, Ph.D., Sc.D., *Professor of Physics and Optometry, Emeritus.*

Owen C. Dickson, M.D., *Associate Clinical Professor of Ophthalmology.*

Henry B. Peters, M.A., *Associate Clinical Professor of Optometry.*

Jack T. Hobson, B.S., *Assistant Professor of Optometry.*

Elwin Marg, Ph.D., *Assistant Professor of Optometry.*

Frederick L. Mason, M.A., *Assistant Professor of Optometry.*

Edward Philip Drescher, M.D., M.S., *Assistant Clinical Professor of Ophthalmology.*

James T. Crosby, Jr., B.S., *Clinical Instructor in Optometry.*

Ferd T. Elvin, A.B., *Clinical Instructor in Optometry.*

Merton C. Flom, M.Opt., *Clinical Instructor in Optometry.*

Robert F. Harrigan, B.S., *Clinical Instructor in Optometry.*

Frederick W. Hebbard, M.S., *Clinical Instructor in Optometry.*

Frank V. Johnson, Jr., M.Opt., *Clinical Instructor in Optometry.*

Robert W. Lester, A.B., *Clinical Instructor in Optometry.*

Edward Ralph Ligon, B.Ed., B.S., *Clinical Instructor in Optometry.*

Fred W. Marcus, M.Opt., *Clinical Instructor in Optometry.*

John F. Regan, B.S., *Clinical Instructor in Optometry.*



Sherburne F. Cook, Ph.D., *Lecturer in Optometry and Professor of Physiology.*

Letters and Science List.—Physiological Optics 105A–105B and 106A–106B are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

UPPER DIVISION COURSES

Prerequisite.—Physics 2A–2B, 3A–3B, Chemistry 1A, 8, Mathematics 3A, Bacteriology 2, †Zoölogy 1A, †Anatomy 102, Psychology 1A, †33, together with all prerequisite courses, and the degree of Associate in Arts or its equivalent are prerequisite to all courses in the Department of Optometry.

101. Advanced Geometrical Optics. (3) I. Mr. Hebbard, 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. Hobson, Mr. Hebbard, Mr. Mason

One unit of laboratory will be given in the second semester.

A study of the states of refraction of the eye, and correlated visual sensations, effects upon visual functions, optical methods of correction, and instruments used to detect and measure anomalous states of refraction.

† While Zoölogy 1A and Anatomy 102 is the preferred biological science sequence in the preoptometry program, this requirement may be satisfied for admission purposes by one of the following alternative sequences:

Zoölogy 1A—Zoölogy 1B

Zoölogy 1A—Comparative Anatomy

Zoölogy 1A—Human Anatomy

Physiology 1, 1L—Human Anatomy

Unless a course in human anatomy, which is the full equivalent of Anatomy 102 at the University of California, is offered in one of the above sequences, Anatomy 102 must be included in the junior year program of the School of Optometry.

‡ Psychology 1B may be substituted for Psychology 33.

103A-103B. Advanced Theoretical Optometry. (3-3) Yr.

Prerequisite: course 102A-102B.

Mr. Marg, Mr. Morgan

Extension of the principles discussed in course 102A-102B to the functions of the eyes in binocular vision. Stereoscopic vision, physical and physiological aspects of the fusion movements, binocular accommodation and convergence, strabismus and other anomalies of binocular vision, and ocular paralyses.

PROFESSIONAL COURSES

401A-401B. Ophthalmic Optics. (2-2) Yr.

Mr. Peters, Mr. Marcus

Lecture and laboratory.

Lectures: history of the development of lenses and spectacles; the optical properties of different glasses; the theory of the design of spectacle lenses. Laboratory: lens surfacing, edging, beveling, mounting, neutralization, and frame fitting.

404A-404B. Practical Optometry. (3-3) Yr. Mr. Harrigan, Mr. Hobson

Prerequisite: courses 102A-102B and 401A-401B.

Lectures and problems dealing with physical eye examinations. A study of instruments and the techniques for their use, interpretation of examination data and prescribing of lenses, and orthoptic training.

406A-406B. Optometry Clinic. (2-2) Yr.

The Staff (Mr. Harrigan in charge)

Prerequisite: courses 102A-102B, 401A-401B, Physiology 115.

Complete physical eye examinations with clinic patients. The adaptation of lenses to the defective eye and the study of abnormal visual conditions.

407A-407B. Pathology of the Eye. (1-2) Yr. Mr. Dickson, Mr. Drescher

Prerequisite: Physiology 115.

Lectures and demonstrations dealing with the identification of pathological conditions in the eye, and the manifestation of systemic disease as indicated by the eye.

499. Special Study for Advanced Undergraduates. (1-4) I and II.

The Staff (Mr. Stoddard in charge)

GRADUATE PROFESSIONAL COURSES

(Concerning conditions for admission to graduate courses, see page 10)

The Bachelor of Science degree in the School of Optometry, or its equivalent, is a prerequisite to all optometry courses of the graduate year.

409A-409B. Clinical Practice. (6-6) Yr. The Staff (Mr. Stoddard in charge)

The examination and treatment, with lenses or orthoptic training, of patients with visual anomalies.

412A-412B. Advanced Clinical Procedures. (3-3) Yr.

Mr. Morgan, Mr. Peters, Mr. Lester

Lectures and class assignments on the orthotics of strabismus and other binocular anomalies, aniseikonia, subnormal vision, telescopic spectacles, contact lens fitting, and allied subjects.

414A-414B. Seminar in Clinical Problems. (2-2) Yr.

The Staff (Mr. Stoddard in charge)

A discussion of the various phases of optometry associated with problems arising from clinical cases.

- 416A-416B. Advanced Pathology of the Eye. (2-2) Yr. Mr. Drescher
An advanced consideration of topics covered in courses 407A-407B with particular reference to the application of this knowledge to the determination of diseases of the visual system in clinic patients.
417. Optometric Law and Economics. (1) II. Mr. Harrigan, Mr. Hebbard
A consideration of the laws governing the practice of optometry, and the problems associated with the establishing of a professional optometric practice.

PHYSIOLOGICAL OPTICS

UPPER DIVISION COURSES

- 105A-105B. Physiological Optics. (3-3) Yr. Mr. Stoddard, Mr. Marg, Mr. Walls
Prerequisite: for course 105A, Physics 108A-108B, Physiology 115; for course 105B, consent of the instructor.
Lectures on the physics, physiology, and psychology of vision.
105A: The visual pathways, the visual field, the pupil- and accommodation-mechanisms, the interaction between radiation and ocular tissue, the aberrations of the eye, illumination, and allied phenomena.
105B: The psychophysics and physiological psychology of light, form, and color senses, and the elements of visual perception.
- 106A-106B. Physiological Optics. (1-1) Yr. Mr. Marg, Mr. Walls
Laboratory experiments in physiological optics to accompany course 105A-105B.
109. Physiological Optics. (3) II. Mr. Walls
Lectures on the physics, physiology, and psychology of vision for students in electrical engineering whose option is illumination engineering.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 201A-201B. Seminar in Advanced Physiological Optics. (2-2) Yr. Mr. Stoddard, Mr. Walls, Mr. Marg
A discussion of selected topics and current research literature in the various fields associated with vision.
203. Binocular Vision and Space Perception. (2) I. Mr. Morgan
A consideration of the precise nature of binocular vision and monocular and binocular space perception.
205. The Evolution of the Visual System. (1) II. Mr. Walls
The structure and the functional properties of the human eye, its orbital accessories, and the central-nervous connections and adnexa, interpreted in the light of their evolutionary development.
299. Research. (2-8) I and II. The Staff (Mr. Stoddard in charge)

RELATED COURSES IN OTHER DEPARTMENTS

- Morphology and Physiology of the Visual System (Physiology 115).
Mammalian Physiology (Physiology 110A-110B).
Geometrical and Physical Optics (Physics 108A-108B).

ORIENTAL LANGUAGES

(Department Office, 107 Durant Hall)

Peter A. Boodberg, Ph.D., *Professor of Oriental Languages.*

Yuen Ren Chao, Ph.D., Litt.D., *Agassiz Professor of Oriental Languages and Literature.*

Ferdinand D. Lessing, Ph.D., *Agassiz Professor of Oriental Languages, Emeritus.*

Denzel Carr, Ph.D., *Associate Professor of Oriental Languages (Chairman of the Department).*

Shih-Hsiang Chen, B.Litt., *Associate Professor of Chinese.*

†Mary R. Haas, Ph.D., *Associate Professor of Siamese and Linguistics.*

*Edward H. Schafer, Ph.D., *Associate Professor of Oriental Languages.*

Donald H. Shively, Ph.D., *Assistant Professor of Oriental Languages.*

Michael C. Rogers, Ph.D., *Instructor in Oriental Languages.*

Susumu W. Nakamura, M.A., *Associate in Oriental Languages.*



Elizabeth Huff, Ph.D., *Lecturer in Oriental Languages.*

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Chen (Chinese); Mr. Carr (Japanese).
Preparation for the Major.—

Required: (a) Emphasis on Chinese—Courses 12A–12B, 13, 14, 17: or courses 12, 13, 14, 17.

(b) Emphasis on Japanese—Courses 9, 19, 39, 49 or 17.

(c) Emphasis on Oriental Linguistics—One of the curricula in (a) or (b) above.

Recommended: English 25.

Sixteen units of lower division language courses in the department are prerequisite to all upper division language courses.

The Major:

Required: (1) With emphasis on Chinese or Japanese:

(a) Chinese: courses 103, 113, 123, 191A–191B; or Japanese: course 119, and 4 units from 129A–129B, 129C–129D, and 32 or 132.

(b) Courses 137A–137B (or 134A–134B), 198.

(c) 5 units selected from courses 100, 113, 117, 124, 133A–133B, 139, 173A–173B, 191C–191D, 193.

(2) With emphasis on Oriental Linguistics:

(a) Courses 100, 117, 123 or 139, 135, 198, and Linguistics 130, 145, 190A–190B.

(b) 3 upper division units in an Oriental language other than the language offered in satisfaction of the lower division requirement.

Recommended: a reading knowledge of French, German, or Russian.

* Absent on leave, 1953–1954.

† Sabbatical leave in residence, 1953–1954.

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. Rogers
8. Indonesian. (3) I. Mr. Carr
An introduction to the official language of Indonesia and Peninsular Malay, a foundation for the study of Malayo-Polynesian languages in general or Classical Malay and Indonesian literature.
9. Elementary Modern Japanese. (5) I. Mr. Rogers, Mr. Shively
- 12A-12B. Elementary Written Chinese. (3-3) Yr. Mr. Chen
To be taken concurrently with courses 17 and 13.
- 12G. Chinese for Graduate Students. (No credit) I. Mr. Boodberg
13. Classical Chinese. (2) II. Mr. Chao
To be taken concurrently with course 12B.
14. Intermediate Chinese. (6) I and II. Mr. Chen in charge
Prerequisite: courses 12A-12B, 13, 17.
- 14G. Chinese for Graduate Students. (No credit) II. Mr. Boodberg
17. Introduction to the Study of Chinese Characters. (2) I. Mr. Chao
To be taken concurrently with course 12A.
19. Elementary Modern Japanese (continued). (5) II. Mr. Nakamura, Mr. Rogers
Prerequisite: course 9.
39. Intermediate Modern Japanese. (4) I. Mr. Nakamura
Prerequisite: courses 9 and 19.
49. Readings in Japanese Literature. (2) I. Mr. Nakamura, Mr. Shively

LECTURE COURSES

22. Indonesian Civilization. (2) II. Mr. Carr
A survey of Indonesian civilization and the effects of contacts with Indian, Islamic, and Western cultures. Open to all students of the University.
- *32. Japanese Civilization. (2) II. Mr. Shively
A broad survey of Japanese civilization dealing with cultural, literary, religious, and social developments, and giving attention to the influence of Chinese and Western cultures.
- 38A-38B. Great Books of Eastern Asia. (1-1) Yr. Mr. Boodberg
Lectures and assigned readings on the great classics of Eastern Asia, in English translation. No knowledge of an Oriental language required. Open to all students of the University.

* Not to be given, 1953-1954.

- *42. Chinese Civilization in the Asiatic Context. (2) I. Mr. Boodberg

UPPER DIVISION COURSES

- †100. Languages of Eastern Asia. (2) I. Mr. Boodberg
A survey course on the nature and distribution of the main languages of Eastern Asia.
- †103. Chinese Narrative Prose. (3) I. Mr. Boodberg
- *107. Intermediate Korean. (2) I. _____
May be repeated without duplication of credit.
- *113. Chinese Classics. (3) II. Mr. Schafer
- *117. Logography and the Evolution of the Chinese Language and Script. (2) II. Mr. Boodberg
118. Introduction to Malayo-Polynesian Linguistics. (2) II. Mr. Carr
Prerequisite: course 8, an equivalent knowledge of one Malayo-Polynesian language, or course 167 or 177.
119. Advanced Japanese. (4) II. Mr. Nakamura
123. Chinese Grammar. (3) I. Mr. Chao
124. Readings in Modern Chinese. (2) II. Mr. Chen
128. Classical Malay Literature. (2) II. Mr. Carr
Prerequisite: course 8.
Reading of *Sĕjarah Mĕlayu* or other standard texts in Roman and Arabic characters.
- 129A-129B. Classical and Medieval Japanese Literary Texts. (2-2) Yr. Mr. Shively
Prerequisite: course 119 or 119A-119B.
- *129C-129D. Japanese Historical Texts and Kambun. (2-2) Yr. Mr. Shively
Prerequisite: course 119 or 119A-119B.
- 133A-133B. Chinese Bibliography. (2-2) Yr. Miss Huff
Open to seniors.
- 134A-134B. Cantonese. (2-2) Yr. Mr. Chao
Not open to students with previous experience in the dialect.
- *135. Phonology of Ancient Chinese. (3) I. Mr. Chao
- 137A-137B. Advanced Colloquial Chinese and Japanese. (2-2) Yr. Mr. Chao, Mr. Nakamura, Mr. Chen
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 or Japanese culture.
139. Japanese Grammar. (2) II. Mr. Carr
154. Mongolian. (3) I and II. Mr. Rogers
May be repeated without duplication of credit.

* Not to be given, 1953-1954.

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

164. Tibetan. (3) I and II. Mr. Nakamura
 May be repeated without duplication of credit.
- *173A-173B. Chinese Philosophical Texts. (2-2) Yr. Mr. Boodberg
- *174A-174B. Thai (Siamese). (3-3) Yr. Miss Haas
- *174C-174D. Readings in Thai. (2-2) Yr. Miss Haas
- *187A-187B. Philological Laboratory. (2-2) Yr. Mr. Boodberg
 Prerequisite: junior standing.
 Philological analysis of an Oriental language using textual material.
- 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. Mr. Boodberg
198. Special Study for Advanced Undergraduates and the Senior Essay. (1 or 2) I and II. Mr. Carr, Mr. Chen
 Required of all majors in Oriental Languages.
199. Special Individual Study. (1-5) I and II. Mr. Carr

LECTURE COURSES

Prerequisite: junior standing. Knowledge of an Oriental language not required.

- *112A-112B. Survey of Chinese Literature and Literary Criticism. (2-2) Yr. Mr. Chen
 The general characteristics, main currents, and representative authors of Chinese literature from the beginning to modern times. Texts and references in English translation critically analyzed. Course 112A is not prerequisite to 112B.
132. History of Japanese Literature. (3) I. Mr. Shively
 From the beginning to modern times, emphasizing Chinese, Buddhist, and Western influences.
- *142. Civilizations of Eastern Asia. (3) I. Mr. Schafer
 Cultures of the higher civilizations, with special emphasis on the roles of religion, mythology, and folklore.
151. Western and Chinese Travelers in Asia. (2) I. _____
152. Marco Polo's Asia. (2) II. _____
- *168. Quietism and Totalitarianism in Chinese Thought and Polity. (2) II. Mr. Boodberg
 Origins and evolution of the doctrines of statism and anarchistic individualism in the formative period of Chinese civilization. Readings in the translation of the primary sources.

* Not to be given, 1953-1954.

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

*172A-172B. Buddhism as a Cultural Factor in the Far East. (2-2) Yr. _____

*182. Life and Times of Confucius. (2) I. Mr. Boodberg

188. Philological Method: Languages and Literatures of Eastern Asia.
(1) I. Mr. Boodberg

GRADUATE COURSES

A reading knowledge of either French or German is prerequisite to the first year of graduate work; a reading knowledge of both French and German is prerequisite to the second year.

*201A-201B. Buddhist Texts. (2-2) Yr. _____

†208. Malayo-Polynesian Linguistics. (2) I. Mr. Carr

212A-212B. Seminar in Chinese Literary History. (2-2) Yr. Mr. Chen
Textual and Aesthetic Criticism.

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. Mr. Schafer

219. Proseminar in Bibliography and Methods in Japanese Studies. (2) I.
Mr. Shively

*229A-229B. Seminar in Japanese Literature. (2-2) Yr. Mr. Shively

235A-235B. Seminar in Chinese Dialectology. (2-2) Yr. Mr. Chao

*236A-236B. Seminar in Contemporary Chinese Writings on Linguistics.
(2-2) Yr. Mr. Chao

*237A-237B. Linguistic Methods in Teaching Oriental Languages. (2-2) Yr.
Mr. Carr, Mr. Chao

A seminar and practicum devoted to the development of teaching material in an Oriental language taught in the department.

239A-239B. Seminar in Japanese Linguistics. (2-2) Yr. Mr. Carr

250. Research. (1-4) I and II. The Staff (Mr. Carr in charge)

RELATED COURSES IN ANOTHER DEPARTMENT

Phonetics and Phonemics (Linguistics 130) formerly Oriental Languages 167.

Types of Linguistic Structure (Linguistics 145) formerly Oriental Languages
177.

American Indian Languages (Linguistics 170) formerly Oriental Languages
178.

Linguistics Laboratory (Linguistics 190A-190B) formerly Oriental Lan-
guages 197A-197B.

Seminar in Descriptive Linguistics (Linguistics 230A-230B) formerly
Oriental Languages 207A-207B.

Seminar in Historical Linguistics (Linguistics 250A-250B) formerly Oriental
Languages 227A-227B.

* Not to be given, 1953-1954.

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

PALEONTOLOGY

(Department Office, 310B Hearst Memorial Mining Building)

Charles L. Camp, Ph.D., *Professor of Paleontology and Curator of Amphibians and Reptiles in the Museum of Paleontology.*

Ralph W. Chaney, Ph.D., *Professor of Paleontology and Curator of the Paleobotanical Collection in the Museum of Paleontology.*

J. Wyatt Durham, Ph.D., *Professor of Paleontology (Acting Chairman of the Department and Acting Director of the Museum of Paleontology, fall semester), Curator of Invertebrate Collections in the Museum of Paleontology.*

Robert M. Kleinpell, Ph.D., *Professor of Paleontology and Curator of Micropaleontological Collections in the Museum of Paleontology.*

Ruben A. Stirton, Ph.D., *Professor of Paleontology (Chairman of the Department), Curator of Mammals and Director of the Museum of Paleontology.*

Ralph L. Langenheim, Ph.D., *Assistant Professor of Paleontology.*

Donald E. Savage, Ph.D., *Assistant Professor of Paleontology and Curator in the Museum of Paleontology.*



Samuel P. Welles, Ph.D., *Lecturer in Paleontology and Principal Museum Paleontologist in the Museum of Paleontology.*

Letters and Science List.—All undergraduate courses in Paleontology are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Savage.

Graduate Adviser: Mr. Kleinpell.

Preparation for the Major.—Two types of major programs are organized on the basis of relationships to geological sciences and to biological sciences.

Required: courses 1 (3) (or Geology 3 for transferring students) and 3 (3); Botany 1 (5) or Zoölogy 1A (4); Geology 1 (3) or 5 (3); matriculation chemistry or physics. For the majors emphasizing geology, Engineering 1A-1B (3-3) and Mineralogy 6 (4) are also required; for the majors emphasizing vertebrate paleontology, Zoölogy 1A-1B (4-4) is also required.

Recommended: Chemistry 1A-1B (5-5); French and German; Geology 118 (4-6) for I (a) (see below); Anthropology 152 (3) for I (b) and II (b) (see below); Botany 16 (3) for II (c) (see below). A reading knowledge of two of the following three languages: French, German, and Russian is essential for efficient advanced work and is required of candidates for the Ph.D. degree.

The department will certify to the completion of a major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the departmental major.

The Major:

I. Paleontology and Geological Sciences.

(a) Emphasis on invertebrate paleontology; courses 102 (3), 111 (4), 112 (4); Geology 102A-102B (2-2), 103 (3); and at least five additional units of

upper division courses chosen from Paleontology or Geology or Zoölogy 112 (summer seashore course) (4).

(b) Emphasis on vertebrate paleontology; courses 102 (3) or 112 (4), 125 (3), 126 (4), 127 (4), 170 (2); Geology 102A-102B (2-2), 103 (3); Zoölogy 113 (4) or 106 (4); and Zoölogy 114 (3) or Genetics 103A-103B (2-2).

(c) Emphasis on Paleobotany: courses 102 (3), 120 (3), and 121 (3), 170 (2); Botany 110A-110B (3-3); Geology 102A-102B (2-2), 103 (3); and at least 4 units chosen from courses 111 (4), 112 (4), 126 (4), 127 (4).

II. Paleontology and Biological Sciences.

(a) Emphasis on invertebrate paleontology: courses 111 (4), 112 (4), 114 (5) or 116 (4) or 117 (4), 136 (5) or 137 (5) or 139 (5), 170 (2); Zoölogy 112 (4) (recommended: summer seashore course); and at least five additional units of upper division courses chosen from Paleontology or Zoölogy 110 (4), 114 (3), 123 (2), 125 (2), 125C (2), or Genetics 103A-103B (2-2).

(b) Emphasis on vertebrate paleontology: courses 125 (3), 126 (4), 127 (4), 170 (2); Zoölogy 106 (4), 113 (4), 114 (3) or Genetics 103A-103B (2-2); and at least four units chosen from courses 111 (4), 112 (4), 120 (3).

(c) Emphasis on paleobotany: courses 120 (3), 121 (3), 170 (2); Botany 110A-110B (3-3), 151 (3); Forestry 114 (3); and at least 6 units chosen from courses 102 (3), 111 (4), 112 (4), 126 (4), 127 (4), 137 (5).

Honor Students in the Upper Division.—Honors are awarded on the basis of excellent work in the major subject.

LOWER DIVISION COURSES

1. General Paleontology. (3) I and II. Mr. Stirton, Mr. Langenheim
I: Mr. Langenheim; II: Mr. Stirton.
Two lectures and one two-hour laboratory period per week, field trip.
A survey of the history and classification of plants and animals.
Methods of interpretation of the fossil record; fossils as evidence of the history of life; evolution of form and structure in plants and animals; sequence of floras and faunas in the rocks.
3. Vertebrate Paleontology. (3) I and II. Mr. Welles
Two lectures and one three-hour laboratory period per week, field trip.
Prerequisite: course 1, or Zoölogy 1A, or Geology 3, or Anthropology 1.
The vertebrate skeleton, vertebrate evolution, principles of vertebrate paleontology.
10. Principles of Paleontology. (2) I. Mr. Chaney
Two lectures per week; one or more field excursions half day Saturday.
Enrollment limited to the size of classroom available. Not open to students who have credit in course 1.
General principles of the history of life.

UPPER DIVISION COURSES

102. Stratigraphy. (3) II. Mr. Langenheim
Two lectures and one three-hour laboratory period per week.
Prerequisite: course 1 or Geology 3, and Geology 103.
Principles involved in the origin, composition, and relationships of stratified rocks.
111. Invertebrate Paleontology. (4) I. Mr. Durham
Two lectures and two three-hour laboratory periods per week.
Prerequisite: course 1, or Geology 1 and 3, or Zoölogy 1A. Paleobiology, morphology, and systematics of the invertebrates.

112. Stratigraphic Paleontology. (4) II. Mr. Kleinpell
Two lectures and two three-hour laboratory periods per week.
Prerequisite: course 1 or Geology 3, and Zoölogy 1A or course 111.
Principles of biostratigraphy and correlation.
114. Micropaleontology. (5) I. Mr. Kleinpell
Three lectures and two three-hour laboratory periods per week.
Prerequisite: course 112.
Paleobiology, taxonomy, and biostratigraphy of the microfossils, with emphasis on the foraminifera.
- *116. Morphology and Phylogeny of the Paleozoic Invertebrates. (4) I.
Two lectures and two three-hour laboratory periods per week.
Prerequisite: course 111 or Zoölogy 112 and course 1 or Geology 3.
Advanced studies in trilobites, brachiopods, graptolites, and pelmatozoans.
117. Morphology and Phylogeny of the Mesozoic and Cenozoic Invertebrates. (4) II. Mr. Durham
Two lectures and two three-hour laboratory periods per week.
Prerequisite: course 111 or Zoölogy 112 and course 1 or Geology 3.
Advanced studies in mollusks, echinoids, and corals.
120. Advanced Paleobotany. (3) I. Mr. Chaney
Two lectures and one three-hour laboratory period per week.
Prerequisite: any lower division course in botany or geology, or consent of instructor.
121. Tertiary Floras of Western America. (3) II. Mr. Chaney
Lectures, proseminar, and laboratory.
Prerequisite: course 120.
125. History of the Lower Vertebrates. (3) I. Mr. Camp
Two lectures, proseminar, and two three-hour laboratory periods per week.
Prerequisite: course 3 or Zoölogy 106.
126. Evolution and Classification of the Mammals. (4) I. Mr. Savage
Two lectures, proseminar, and two three-hour laboratory periods per week.
Prerequisite: course 3 or Zoölogy 106.
127. History and Paleocology of Higher Vertebrates. (4) II. Mr. Savage
Two lectures, proseminar, and two three-hour laboratory periods per week.
Prerequisite: course 126.
136. Paleontology and Stratigraphy of the Paleozoic and Early Mesozoic. (5) I. Mr. Langenheim
Three lectures and one laboratory period per week, field trips.
Prerequisite: course 111.
Invertebrate paleontology and stratigraphy of the marine Paleozoic and Early Mesozoic of the Pacific Coast.
137. Paleontology and Stratigraphy of the Late Mesozoic and Cenozoic. (5) I. Mr. Durham
Three lectures, laboratory, and field trips.
Prerequisite: course 111.
Invertebrate paleontology and stratigraphy of the marine Late Mesozoic and Cenozoic of the Pacific Coast.

* Not to be given, 1953-1954.

139. Cenozoic History of the West Coast of North America. (5) II.
Mr. Kleinpell
Three lectures and two three-hour laboratory periods per week. Assigned readings.
Prerequisite: course 114.
Emphasis on correlation, sequence, and relationships of West Coast foraminiferal faunas.
170. History of Paleontology. (2) II. Mr. Camp
Two lectures per week.
Prerequisite: consent of instructor.
Review of discoveries and development of ideas, principles and methods, with emphasis on modern trends and theories.
199. Special Study for Advanced Undergraduates. (1-5) I and II or in field during the summer. The Staff

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

252. Seminar in Stratigraphy. (2) II. Mr. Langenheim
Current literature and general problems.
253. Seminar in Micropaleontology. (2) I and II. Mr. Kleinpell
Current literature and general problems.
254. Seminar in Mammalian Paleontology. (2) I and II.
Mr. Stirton, Mr. Savage
255. Seminar in Vertebrate Paleontology. (2) I and II. Mr. Camp
256. Seminar in Invertebrate Paleontology. (2) I and II. Mr. Durham
Current literature and general problems.
257. Seminar in Paleobotany. (2) I and II. Mr. Chaney
Current literature and general problems.
290. Graduate Seminar. (No credit) I and II.
The Staff (Mr. Savage, Mr. Chaney in charge)
Prerequisite: consent of instructor for non-majors.
Review of recent literature and current research in the department.
Required of all graduate students in the department.
299. Research in Paleontology. (1-6) I and II. The Staff

MUSEUM OF PALEONTOLOGY

The Museum of Paleontology, situated in the Hearst Memorial Mining Building on the Berkeley campus, was organized in 1921, and is supported chiefly by funds donated by the late Miss Annie M. Alexander. The Museum maintains the largest fossil collections on the Pacific Coast, and makes use of these in teaching and research. The Matthew Memorial Library of Paleontology is a branch of the General Library which provides service to both faculty and students. Anyone wishing to make use of the facilities of the Museum should address the Director.

PHILOSOPHY

(Department Office, 4405 Dwinelle Hall)

George P. Adams, Ph.D., *Professor of Philosophy.*

¹William R. Dennes, D.Phil., LL.D., *Professor of Philosophy.*

Stephen C. Pepper, Ph.D., L.H.D., *Mills Professor of Intellectual and Moral Philosophy and Civil Polity (Chairman of the Department of Philosophy).*

Edward W. Strong, Ph.D., *Professor of Philosophy.*

Jacob Loewenberg, Ph.D., *Professor of Philosophy, Emeritus.*

Karl Aschenbrenner, Ph.D., *Associate Professor of Philosophy.*

Benson Mates, Ph.D., *Associate Professor of Philosophy.*

Celestine J. Sullivan, Ph.D., *Associate Professor of Philosophy.*

Jan Kalicki, Ph.D., *Assistant Professor of Philosophy.*

²Joseph Tussman, Ph.D., *Assistant Professor of Philosophy.*



Leon Henkin, Ph.D., *Assistant Professor of Mathematics.*

Fundamental ideas and ideals play an indispensable part in the life and activities of each culture area and epoch. They reflect the manner in which each age organizes its knowledge and the major interests of its civilization. They disclose the problems generated by the impact of traditional habits of life and thought upon the requirements imposed by new conditions and by fresh discoveries of knowledge. They portray the efforts of reflective thought to formulate more adequate concepts and ideals for the organization and interpretation of experience.

Courses offered by the Department of Philosophy provide an opportunity for the student to become acquainted with the leading ideas in terms of which men attempt at the present time to understand the broader fundamental aspects of their world and their civilization.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Department Major Adviser: Mr. Tussman.

Preparation for the Major.—Courses 20A–20B and 12A.

The Major.—Upper division courses in philosophy are arranged in three groups, A, B, and C.

Of the 24 units required for the major, 6 units must be taken from courses in Group A, 6 units from courses in Group B, and 6 units from courses in Group C. The student is allowed to select the remaining 6 units from any courses in the department, and may, with the approval of the departmental adviser, take 3 of these units in another department, provided the course selected is regarded as relevant to the major.

LOWER DIVISION COURSES

6A–6B. Introduction to Philosophy. (3–3) Yr. Beginning each semester.

Mr. Adams, Mr. Aschenbrenner, Mr. Mates, Mr.

Pepper, Mr. Strong, Mr. Sullivan

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.

¹ In residence fall semester only, 1953–1954.

² In residence spring semester only, 1953–1954.

SOPHOMORE COURSES

- 12A-12B. Logic. (3-3) Yr. Mr. Henkin, Mr. Kalicki
- 20A-20B. History of Philosophy. (3-3) Yr. Mr. Dennes, Mr. Sullivan
 I. From the Pre-Socratics to Plotinus; Mr. Dennes.
 II. From the Scholastics to Kant; Mr. Sullivan.
- *30. Scientific Method. (3) II. _____

UPPER DIVISION COURSES

General Prerequisites.—Students enrolling in any upper division course must have completed 6 units in course 6A-6B or 20A-20B.

GROUP A

Courses concerned with a critical analysis and appraisal of specific human interests such as art, literature, morality, religion, science, and society.

104. Ethics. (3) II. Mr. Pepper
 Moral Values: 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. _____
 The nature and the validity of religious ideas.
128. Political Philosophy. (3) II. Mr. Tussman
 Analysis of political obligation and related problems.
- 136A-136B. Aesthetics. (3-3) Yr. Mr. Pepper, Mr. Aschenbrenner
 A study of the nature of the aesthetic experience and of the work of art with detailed applications to music, the visual arts, and literature.
- *136C. Aesthetics. (3) I. Mr. Strong
 A study of values in applied and fine arts, and of the place and role of art in human affairs.
 At the discretion of the instructor in course 136A, 136B, or 136C, the general prerequisites may be waived for major students in literature or in the fine arts. Course 136C together with either 136A or 136B will be counted as a year course of 6 units in aesthetics. Course 136C may be taken in addition to both 136A and 136B without loss of credit.
- *138. Philosophy of Art. (3) I. Mr. 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, 1953-1954.

- *111. Metaphysics. (3) II. _____
113. Logic. (3) II. Mr. Mates
Prerequisite: course 12A or its equivalent.
114. Theory of Knowledge. (3) I. Mr. Kalicki
123. Man and Nature. (2) I. Mr. Adams
A critical survey of ideas concerning the relation between man and nature, within the western tradition.
- *124. Philosophy of Science. (3) I. _____
125. Theory of Value. (3) 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) II. Mr. Mates
Prerequisite: six units in 6A-6B or 20A-20B; and 12A.
- *135A-135B. Contemporary Tendencies in Philosophy. (3-3) Yr. _____
140. Philosophy of Law. (3) II. Mr. Tussman
A study of philosophical problems arising in the legal context.
- 141A-141B. Survey of Modern Logic. (3-3) Yr. Mr. Kalicki
An informal exposition of some of the principal notions and results of modern logic; intended primarily for students not specializing in logic.
147. Theory of Historical Inquiry. (3) 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. _____
105. Kant. (2) I. Mr. Adams
- *115. Medieval and Early-Modern Thought. (3) II. Mr. Strong
116. Plato. (3) I. Mr. Mates
117. Aristotle. (3) II. Mr. Aschenbrenner
118. Spinoza. (3) I. Mr. Sullivan
- 119A*-119B. British Empiricism. (3-3) Yr. Mr. Aschenbrenner
(Formerly numbered 119.)
119A. With special reference to Locke and Berkeley.
119B. With special reference to Hume. I.
- *121. Hobbes. (3) I. Mr. Tussman
- *126. Hellenistic Philosophy: The Stoics, Epicureans, and Skeptics. (3) I. Mr. Mates
129. Leibniz. (3) II. Mr. Sullivan
130. Materialism and Naturalism. (3) II. Mr. Strong
Historical and critical studies of the chief philosophical materialists from Democritus to Dewey.

* Not to be given, 1953-1954.

132. History of Cartesianism to Malebranche. (3) I. _____
139. Philosophy of Kierkegaard. (3) II. _____
- *145. American Philosophy. (3) II. Mr. Aschenbrenner
199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Pepper in charge)

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- *204. Seminar in Ethics. (2) I. Mr. Pepper
- 210A-210B. Seminar in the History of Philosophy. (2-2) Yr. _____
211. Seminar in Metaphysics. (2) II. Mr. Sullivan
- 213A-213B. Seminar in Logic. (2-2) Yr. Mr. Kalicki
- *214. Seminar in the Theory of Knowledge. (2) II. _____
- *216A-216B. Seminar in Plato. (2-2) Yr. Mr. Mates
- *218A-218B. Seminar in Semantics. (2-2) Yr. Mr. Mates
- *221. Metaphysics and Philosophical Analysis. (2) II. Mr. Aschenbrenner
222. Seminar in the Philosophy of Mind. (2) I. Mr. Aschenbrenner
- *225. Seminar: Theory of Value. (2) II. Mr. Pepper
228. Seminar in Political Philosophy. (2) II. Mr. Tussman
231. Seminar in the Philosophy of Santayana. (2) I. Mr. Sullivan
- *232. Seminar in Philosophical Naturalism. (2) II. Mr. Dennes
236. Aesthetics from the Metaphysical Standpoint. (2) I. Mr. Pepper
A special study will be made of the principles of criticism in the arts.
- *238. Seminar in the Philosophy of Art. (2) II. Mr. Aschenbrenner
- *247. Seminar in Theories of History. (2) I. Mr. Strong
250. Special Studies. (1-6) I and II. The Staff (Mr. Pepper in charge)
Enrollment is ordinarily restricted to students who have been admitted to candidacy for the doctor's degree.

PHYSICAL EDUCATION

(Department Office, 103 Gymnasium for Men)

- Frederick W. Cozens, Ph.D., *Professor of Physical Education and Director of Physical Education (Chairman of the Department)*.
- Pauline Hodgson, Ph.D., *Professor of Physical Education and Associate Director of Physical Education for Women*.
- Anna Espenschade, Ph.D., *Professor of Physical Education*.
- Franklin M. Henry, Ph.D., *Professor of Physical Education*.
- Sarah R. Davis, A.B., *Assistant Professor of Physical Education, Emeritus*.
- Louise S. Cobb, Ph.D., *Supervisor of Physical Education*.
- Lucile K. Czarnowski, M.S., *Supervisor of Physical Education*.

* Not to be given, 1953-1954.

- Heber A. Newsom, M.A., *Supervisor of Physical Education.*
 Henry A. Stone, M.S., *Supervisor of Physical Education.*
 Marie H. Glass, A.B., *Associate Supervisor of Physical Education.*
 Charles J. Keeney, A.B., *Associate Supervisor of Physical Education.*
 Ralfe D. Miller, M.A., *Associate Supervisor of Physical Education.*
 Edgar Nemir, A.B., LL.B., *Associate Supervisor of Physical Education.*
 Charles A. Pease, A.B., *Associate Supervisor of Physical Education.*
 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.*
 Arthur J. Gallon, M.A., *Acting Assistant Supervisor of Physical Education.*
 Katharine Gilcoyne, M.A., *Assistant Supervisor of Physical Education.*
 Mary Jean Pyatt, M.S., *Junior Supervisor of Physical Education.*
 Margaret Ann Iden, M.S., *Junior Supervisor of Physical Education.*
 Charles Lucchesi, A.B., *Junior Supervisor of Physical Education.*
 Mary L. Norrie, M.A., *Junior Supervisor of Physical Education.*



- Clinton W. Evans, B.S., *Lecturer in Physical Education.*
 Lynn O. Waldorf, A.B., *Lecturer in Physical Education.*

Letters and Science List.—Course 105 is included in the Letters and Science list of courses. For regulations governing this list, see page 7.

The incidental fee payable by all students at the time of registration entitles students to the use of 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 regulation of the department: (a) Failure to return equipment or clothing on or before the date posted for such return at the end of each semester, or at the end of each special session of the University, or failure to return athletic supplies (balls, bats, etc.) on the date of issue, \$1 for each twenty-four hours until the full purchase price of the article has been reached. (b) Failure to meet the appointment for the physical examination, \$2. (c) Overnight use of dressing locker, \$2. Failure to empty locker within designated time, \$2.

LOWER DIVISION COURSE FOR MEN

1. Physical Education Activities. (½) I and II. The Staff

Sections meet twice weekly at various hours, M Tu W Th.

The following activities are open to those found properly qualified: archery†, baseball, softball baseball, basketball, boxing, wrestling, fencing, crew, American football, touch football, rugby football, golf, gymnastics,

* Absent on leave, 1953-1954.

† See Lower Division Courses for Men and Women.

body building, tumbling, handball, squash, figure skating†, badminton, soccer, swimming, diving, tennis, track, modern dance†, folk dance†, social dance†, elementary school skills and rhythms†, trampoline, volleyball, and weightlifting. Special guidance and facilities are provided for men wishing to correct bodily defects or accomplish specific development.

A physical examination is required of all men entering the University, and a special medical examination is demanded of all athletes prior to training for, or participation in, intramural or intercollegiate competition.

LOWER DIVISION COURSE FOR WOMEN

26. Physical Education Activities. (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.
Elementary School Skills and Rhythms†.

LOWER DIVISION COURSES FOR MEN AND WOMEN

- 5A. First Aid. (1) I and II. Miss Coleman
 (Formerly numbered 85A.)
 Standard course. Sections meet two hours per week.
 Upon successful completion of the course, the Red Cross Certificate is awarded.
- *5B. Advanced First Aid. (No credit) I and II. Miss Coleman
 (Formerly numbered 85B.)
 Sections meet two hours per week for eight weeks.
 Upon successful completion of the course, the Red Cross Certificate is awarded.
20. Introduction to Physical Education. (1) I and II. 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.
35. Rhythmic Basis of Dance and Allied Arts. (2) I. Miss Czarnowski
 (Formerly numbered 54.)
 This course is planned for students interested in dance, music, and art. Consideration given to nature and function of rhythm, rhythmic analysis and notation, rhythmic form in the temporal and spatial arts.

* Not to be given, 1953-1954.

† See Lower Division Courses for Men and Women.

UPPER DIVISION COURSE FOR MEN

171. Conditioning of Athletes and Care of Injuries. (2) I. Mr. Stone
 (Formerly numbered 318.)
 Lecture and a three-hour laboratory period per week.
 Prerequisite: course 5A, Physiology 1 or Anatomy 102.
 Modern principles and practice in conditioning and care of athletes;
 individual variation and needs as to sleep, diet, health, and activity habits;
 care of injuries with special emphasis on therapy, taping, and protective
 equipment.

UPPER DIVISION COURSES FOR WOMEN

- 160A-†160B. Theory of Dance. (3-3) Yr. Miss Czarnowski
 160A, II; 160B, I.
 Lectures and laboratory.
 Prerequisite: course 35 and Psychology 1A.
- 165A. Theory of Group Athletics. (3) I. Miss Espenschade, Miss Hodgson, Miss Gilcoyne
 Lectures and laboratory.
 Recommended: course 101.
- 165B. Theory of Gymnastics. (2) I. Miss Cobb
 Lectures and laboratory.
 Recommended: course 101. Course 165A is not prerequisite to 165B.
166. Theory of Individual Athletics. (2) II. Mrs. Glass, Miss Coleman, Miss Bartlett
 Prerequisite: a working knowledge of the activities included.

UPPER DIVISION COURSES FOR MEN AND WOMEN

101. Kinesiology and Body Mechanics. (4) I. Miss Bartlett
 Lectures and laboratory.
 Prerequisite: Physiology 1, 1L, and Anatomy 102.
 The study and application of physical structure and muscular move-
 ments in various physical education activities. Description and 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 cardio-
 vascular and respiratory function.
110. Psychologic Bases of Physical Activity. (2) I. Mr. Henry
 Prerequisite: Psychology 1A.
 Perception, motivation, learning and emotion in relation to physical
 activity; reaction time and coördination. Personal adjustment and social
 behavior as observed in play. The psychology of competition.

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

120. Sports in American Society. (2) I. Mr. Cozens
 Open to all upper division students without prerequisite.
 An examination of the interrelationships of sports and physical recreation with other aspects of American culture: industrialization and urbanization, communication and transportation, war and peace. Sports and American education. The influence of ideas, ideals, traditions and democratic concepts.
130. History and Theories of Physical Education. (3) II. Miss Cobb
 Prerequisite: course 20, Physiology 1, 1L, and Psychology 1A.
 History of American and foreign physical education. Its cultural background: political, social, educational. Comparative physical education. Designed to develop critical judgment regarding the purposes and significance of physical education in modern life and education on the basis of pertinent cultural and scientific factors.
- 131A-131B. The Organization and Administration of Physical Education. (2-2) Yr. 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 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.
 Nature, scope and significance of recreation in the social and economic life of the American people. Meaning and nature of play. History, purpose, function, organizational patterns and interrelationships of groups, agencies and institutions which serve the recreational needs of the community.
 Course 140 is not open to students who have taken course 143A or 143B; and the latter are open for two units credit to students who have taken course 140.
- 143A. Theory and Principles of Recreation. (3) I. Mrs. Glass
 Prerequisite: upper division standing.
 The meaning and significance of leisure in modern society; essential characteristics and uses of recreation; theories of play; the recreation movement in the United States.
- 143B. The Organization and Administration of Recreation. (3) II. Mr. Miller
 Prerequisite: course 143A.
 Community interrelationships affecting recreation; the recreation program; areas and facilities and their operation, recreation organization; financial support, records, personnel administration, publicity, and public relations.

- 144A. Field Laboratory Course. (No credit) Mrs. Glass
Prerequisite: completion of the lower division requirements of the group major in recreation.
A minimum of six weeks' full-time field experience, or its equivalent, in a variety of recreational assignments based on the needs and experience of the student.
- 144B. Field Laboratory Course. (No credit) Mrs. Glass
Prerequisite: course 144A.
A continuation of course 144A including additional field experience in recreational activities.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. 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 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. Lucchesi
One lecture and two laboratory hours to be arranged.
Prerequisite: course 1 in swimming or the equivalent.
311. The Theory and Teaching of Lifesaving and Water Safety. (1) I and II. Mr. Flanagan, Mr. Lucchesi
One lecture and two laboratory hours to be arranged.
Prerequisite: course 310 or the equivalent, and Red Cross Senior Life Saving Certificate.
313. The Theory and Teaching of American Football. (1) II. Mr. Waldorf
One lecture and two laboratory hours to be arranged.
320. Theory and Practice of Officiating in Football and Basketball. (1) I.
One lecture and two laboratory hours to be arranged. Mr. Newsom
- †322. The Theory and Teaching of Field Sports. (1) II. Mr. Newsom
One lecture and two laboratory hours to be arranged.
Prerequisite: consent of instructor.

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

METHODS COURSES FOR MEN AND WOMEN

343. The Theory and Teaching of Recreational Activities. (1) II.

Mr. Pease, Miss Iden

Lectures, demonstrations, and reading assignments.

Discussion of and participation in the organization and direction of recreational activities including social and group games, rhythms and dances, parties for mixed groups, and games of low organization.

385. First Aid Instructor's Course. (1) II.

Miss Coleman

Prerequisite: Standard and Advanced American Red Cross First Aid Certificates.

Methods and techniques in teaching first aid. Students successfully completing this course are eligible to receive the American Red Cross Instructor's Certificate.

METHODS COURSES FOR WOMEN

333. Theory and Teaching of Lifesaving and Water Safety (Women). (1) II.

Miss Bernhard

Prerequisite: Red Cross Senior Life Saving Certificate.

Instruction and practice in the techniques of swimming, of diving, and of lifesaving; the organization of this material for teaching; methods of presentation to students; standards for grading performance. A written and a practical examination are required.

334. The Teaching of Advanced Swimming, Diving, and Water Ballet. (1) I.

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 spring-board diving; development of synchronized swimming and water ballet; conduct of competitive events.

GRADUATE COURSES FOR MEN AND WOMEN

- †231. Administration of Physical Education. (2) II.

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

(Department Office, 366 LeConte Hall)

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.*

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

- 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., Sc.D., LL.D., *Professor of Physics and Director of the Radiation Laboratory.*
Victor F. Lenzen, Ph.D., *Professor of Physics.*
Leonard B. Loeb, Ph.D., *Professor of Physics.*
Edwin M. McMillan, Ph.D., *Professor of Physics.*
Wilson M. Powell, Ph.D., *Professor of Physics.*
Emilio Segrè, Ph.D., *Professor of Physics.*
Edward Teller, 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.*
Arthur F. Kip, Ph.D., *Associate Professor of Physics.*
Burton J. Moyer, Ph.D., *Associate Professor of Physics.*
*William A. Nierenberg, Ph.D., *Associate Professor of Physics.*
Chaim Richman, Ph.D., *Associate Professor of Physics.*
Owen Chamberlain, Ph.D., *Assistant Professor of Physics.*
Gerson Goldhaber, Ph.D., *Acting Assistant Professor of Physics.*
Carson D. Jeffries, Ph.D., *Assistant Professor of Physics.*
Walter D. Knight, Jr., Ph.D., *Assistant Professor of Physics.*
Harold W. Lewis, Ph.D., *Assistant Professor of Physics.*
John H. Reynolds, Ph.D., *Assistant Professor of Physics.*
Robert J. Riddell, Jr., Ph.D., *Assistant Professor of Physics.*
Malvin A. Ruderman, Ph.D., *Assistant Professor of Physics.*
Henry B. Silsbee, Ph.D., *Assistant Professor of Physics.*
Herschel R. Snodgrass, Ph.D., *Acting Assistant Professor of Physics.*
*Herbert F. York, Jr., Ph.D., *Assistant Professor of Physics.*



- Norris E. Bradbury, Ph.D., *Professor of Physics, Los Alamos Laboratory.*
Cecile M. DeWitt, D.D'Etat (Paris), *Lecturer in Physics.*
Robert Karplus, Ph.D., *Lecturer in Physics for the fall semester.*
Wulf B. Kunkel, Ph.D., *Lecturer in Physics.*
Jack M. Peterson, Ph.D., *Lecturer in Physics.*
R. Stephen White, Ph.D., *Lecturer in 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.*

* Absent on leave, 1953-1954.

- 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.*
 Robert K. Mortimer, Ph.D., *Instructor in Medical Physics.*
 R. Lowry Dobson, M.D., Ph.D., *Lecturer in Medical Physics.*

Letters and Science List.—All undergraduate courses in physics except 125, 128, 128L, 131 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Helmholtz, Mr. Knight, Mr. Kip.

Preparation for the Major.—Required: Courses 4A, 4B, 4C, or the equivalent (under special circumstances courses 2A–2B and 3A–3B may be accepted); Chemistry 1A–1B, Mathematics C, 3A–3B, 4A–4B, or their equivalents. Recommended: Mathematics 8, and a reading knowledge of French and German.

The Major.—The major must include courses 105A–105B, 108B, 110A–110B, 115, 121, and 3 additional units chosen, with the approval of the major adviser, from other upper division courses in physics or mathematics. The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses taken in the department. Students who cannot maintain such an average may be required at any time to withdraw from the major in physics.

Engineering Physics.—The College of Engineering with the cooperation of the Physics Department offers a curriculum in engineering physics leading to the degree of Bachelor of Science. Major Adviser, Mr. Fretter. (See section on Program of Study in Engineering Physics in CIRCULAR OF INFORMATION, DEPARTMENTS AT BERKELEY.)

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. Fretter, Mr. Jeffries, Mr. Moyer, Mr. Snodgrass, Mr. H. E. 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. Snodgrass

Required for premedical students. Recommended for all students who elect course 2A–2B.

Mechanics, properties of matter, heat, sound, light, electricity and magnetism, atomic and nuclear physics. Experimental work planned to accompany the lectures in course 2A–2B.

- 4A. General Physics. (4) I and II. Mr. Goldhaber, Mr. Lenzen, Mr. Silsbee
 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. Brode, Mr. Kip, Mr. Knight
 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. Goldhaber, Mr. Jenkins, Mr. Reynolds
 Three lectures and one three-hour laboratory period per week.
 Prerequisite: course 4A.
 Open to students in all colleges. Required for students in the College of
 Letters and Science whose major subject is physics, and for students in
 engineering and chemistry.
 Heat, wave motion, sound, and light.
10. Descriptive Introduction to Physics. (3) II. Mr. H. E. 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 Univer-
 sity 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 Univer-
 sity with partial credit in general physics. Courses 32A, 32B cover part of
 the lecture work in 2A-2B, and 31D covers part of the lecture work in 4C,
 whereas courses 34A, 34B, 34C cover the lecture work only of 4A, 4B, 4C,
 respectively. Students should enroll under one or more of the following
 numbers:
 31D. Wave Motion, Sound, and Light. (2) I and II.
 32A. Mechanics, Properties of Matter, Sound, and Heat. (1-3) I and II.
 32B. Light, Electricity, and Magnetism. (1-3) I and II.
 34A. Mechanics and Properties of Matter. (3) I and II.
 34B. Electricity and Magnetism. (3) I and II.
 34C. Heat, Wave Motion, Sound, and Light. (3) I and II.

41A. Properties of Matter. (1) I and II.

Mr. Goldhaber, Mr. Lenzen, Mr. Silsbee

Equivalent to part of 4A. Students enrolled under 41A will attend the lectures and laboratory of 4A, but will be held only for the portion of that course covering properties of matter (formerly included in course 1B).

41B. Heat. (1) I and II.

Mr. Goldhaber, Mr. Jenkins, Mr. Reynolds

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. Goldhaber, Mr. Jenkins, Mr. Reynolds

Equivalent to part of 4C. Students enrolled under 41D will attend the lectures and laboratory of 4C, but will be held only for the portion of that course covering wave motion, sound, and light (formerly included in course 1D).

UPPER DIVISION COURSES

Courses 4A, 4B, 4C and differential and integral calculus are prerequisite to all upper division courses except course 108A-108B, Sec. 2.

104. Vector Analysis. (3) I and II.

Mr. Lewis, Mr. Ruderman

I: Mr. Lewis; II: Mr. Ruderman.

Elements of vector analysis and its application to physics. Importance of an invariant formulation of physical laws. Elements of tensor analysis only in regard to general applications.

105A-105B. Analytic Mechanics. (3-3) Yr. Beginning each semester.

Mr. Chamberlain, Mr. Jeffries, Mr. Moyer, Mr. Reynolds, Mr. R. S. White

105A. I: Mr. Moyer, Mr. White; II: Mr. Chamberlain.

105B. I: Mr. Reynolds; II: Mr. Jeffries.

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. H. E. White

Two lectures and one three-hour laboratory period per week.

Prerequisite: courses 2A-2B, 3A-3B.

Geometrical methods applied to the optics of mirrors, prisms, and lenses.

108B. Physical Optics. (3) I and II.

Mr. Jeffries, Mr. Jenkins, Mr. R. S. White

Lectures, I: Sec. 1, Mr. Jenkins; II: Sec. 1, Mr. Jeffries; Sec. 2, Mr. R. S. White.

Two lectures and one three-hour laboratory period per week.

Section 2 open only to students in optometry.

Course 108A is not prerequisite to 108B.

The phenomena of diffraction, interference, and polarization of light, and their applications.

110A-110B. Electricity and Magnetism. (3-3) Yr. Beginning each semester.

Mr. Brode, Mr. Goldhaber, Mr. Knight, Mr. Thornton

110A. I: Mr. Brode, Mr. Thornton; II: Mr. Knight; 110B. I: Mr. Knight; II: Mr. Goldhaber.

Prerequisite: Mathematics 110A-110B.

Elementary and mathematical theory of electrostatics, magnetostatics, magnetism, steady and varying currents, electron theory, and electromagnetic waves.

- 110C. Advanced Electrical Laboratory. (2) I and II.
Mr. Chamberlain, Mr. Silsbee
The use and calibration of precision electrical instruments and electronic devices.
- 110D. Modern Physics Laboratory. (2) 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. Silsbee
I: Mr. Silsbee; II: Mr. Loeb.
The thermal properties of matter, with an introduction to the mathematical theory of heat conduction, the kinetic theory of matter, and thermodynamics.
115. Introduction to Quantum Mechanics. (3) I and II.
Mr. Chamberlain, Mr. McMillan
I: Mr. Chamberlain; II: Mr. McMillan.
Prerequisite: courses 105A, 121, Mathematics 110A-110B.
The classical background, basic ideas and methods of quantum mechanics, with applications to atomic physics.
121. Introduction to Atomic Structure. (3) I and II.
Mr. Kip, Mr. Kunkel, Mr. Loeb
I: Mr. Loeb, Mr. Kunkel; II: Mr. Kip.
An introduction to atomic physics treating cathode and positive rays, the electron, thermionic emission, the photoelectric effect, the structure of the atom, and the interpretation of spectra and X rays.
124. Radioactivity and Nuclear Structure. (3) I and II.
I: Mr. Segrè; II: Mr. Thornton. Mr. Segrè, Mr. Thornton
Prerequisite: course 121.
Discovery of radioactivity, nature of radioactivity, α , β , and γ rays, theory of successive transformation, artificial transmutations, nuclear structure.
- 129A-129B. Nuclear Physics. (3-3) Yr. Mr. Alvarez
Prerequisite: course 121.
Natural and artificial radioactivity, nuclear transformations, nuclear structure, magnetic moments, nuclear radiations, mesons, high energy physics. Designed to cover more thoroughly the material of course 124.
130. Introduction to Solid State Physics. (3) II. Mr. Kittel
Prerequisite: course 121.
An elementary treatment of the basic physics of ionic crystals, dielectrics, magnetic substances, superconductors, and the electrical and mechanical properties of metals.
199. Special Study for Advanced Undergraduates. (1 or 2) I and II.
The Staff (Mr. Birge in charge)
All special work of upper division grade not included in courses announced above. Designed to introduce students to advanced topics and to the technique and methods of research. Credit value to be fixed in each case.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

- 204A-204B. The Reduction of Observations. (2-2) Yr. Mr. Birge
Instruments and methods, analytical and graphical, employed in reduction of data to final results, and errors of the results—including numerical interpolation and integration, theory of least squares, theory of errors.

- 205A. Advanced Dynamics. (3) I. Mr. Lenzen
Prerequisite: course 105A-105B.
The generalized methods of Lagrange, Hamilton, and Jacobi.
- 205B. Advanced Dynamics. (3) II. Mr. 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.
211. Spectroscopy and Atomic Structure. (3) II. Mr. H. E. White
Prerequisite: courses 108B and 121.
Methods of excitation and analysis of line and band spectra. Energy levels of atoms and diatomic molecules interpreted in terms of the vector model. Experimental results and applications.
212. Thermodynamics. (3) I and II. Mr. Reynolds, Mr. Ruderman
I: Mr. Ruderman; II: Mr. Reynolds.
Principles of thermodynamics and applications to heat capacities, reaction equilibria, radiation, phase transitions and low temperature physics.
219. Statistical Mechanics and Kinetic Theory. (3) I and II.
I: Mr. Kittel; II: Mr. Lenzen. Mr. Kittel, Mr. Lenzen
Foundations of statistical mechanics. Classical and quantum statistics with applications to properties of matter; kinetic theory; gases at very low pressure; Boltzmann transport equation; irreversible processes.
- 221A-221B. Theoretical Atomic Physics. (3-3) Yr. Mr. Teller
Physical principles of quantum theory, correspondence, complementarity; atomic states and transitions; elementary atomic and nuclear collision problems.
222. Mathematical Methods of Theoretical Physics. (3) I. Mr. Riddell
The setting up and solution of differential and integro-differential equations; statistical and algebraic methods for the treatment of problems of physics.
- 223A-223B. Advanced Quantum Mechanics of Atoms, Molecules and Solids. (3-3) Yr. Mr. Karplus, Mr. Riddell
223A: Mr. Karplus; 223B: Mr. Riddell.
A detailed discussion of the quantum mechanics of atoms and molecules, using group theoretical methods. Interaction of nuclei with electronic systems. Advanced solid state theory.
- 224A-224B. Nuclear Physics. (2-2) Yr. Mr. McMillan, Mr. Segrè
224A: Mr. McMillan; 224B: Mr. Segrè.
Prerequisite: a knowledge of the elements of quantum mechanics.
The structure of the nucleus. Spontaneous nuclear transformations and radiations accompanying them. Induced nuclear reaction. Neutron physics.

- 230A-230B. Quantum Theory of Fields. (3-3) Yr. Mrs. DeWitt
Quantization of the electromagnetic field; formal and phenomenological meson theories with applications; general relativity.
- 231A-231B. Advanced Atomic and Nuclear Physics. (3-3) Yr. Mr. Peterson
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 1953-1954 will probably include seminars in (a) Theoretical Physics (I and II, Ruderman and Riddell); (b) Cosmic Rays (I and II, Brode and Fretter); (c) Discharge through Gases (I and II, Loeb); (d) Spectroscopy (I and II, Jenkins); (e) Nuclear Physics (I and II, Helmholtz and Segrè); (f) Molecular Beams and Low Temperature Physics (I and II, Silsbee); (k) Solid State Theory (I and II, Kittel and Kip).
295. Research. (1-6) I and II. The Staff (Mr. Birge in charge)

MEDICAL PHYSICS

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. Artificial Radioactivity in the Biological Sciences. (2) II.
Mr. Hamilton
Prerequisite: course 2A-2B, Chemistry 1A-1B, and one of the following: Zoölogy 1A-1B, Physiology 1, 1L, or Botany 1.
The theory, methods and interpretation of the use of artificial radioactive elements for research in the biological sciences. Special emphasis is placed upon the role of radioactive tracers for the interpretation of the dynamic aspects of metabolic phenomena in biological systems.
- 126L. Artificial Radioactivity in the Biological Sciences. (1) II.
Laboratory work to accompany course 126. Mr. Hamilton
128. Measurement of Radiations. (1) I. Mr. Mortimer
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 the biological methods and dosimetry.

- 128L. Measurement of Radiations. (2) I. Mr. Tobias
Prerequisite: courses 2A-2B, 3A-3B, or equivalent and consent of instructor.
Laboratory work to accompany course 128.
131. Biological Effects of Radiation. (3) II. Mr. Dobson
Two four-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 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.
225. The Use of Radioactive Isotopes in Experimental Medicine. (1) I. Mr. J. H. Lawrence
Consideration of safe tracer doses, biologic and genetic effects, principles of internal radiation therapy, tracer techniques and examples, review of literature.
290. Seminar. (1-3) I and II. The Staff (Mr. J. H. Lawrence in charge)
Advanced study in various fields of medical physics. Topics will vary from year to year. The program for 1953-1954 will probably include seminars in (g) Biological Effects of Radiation (II, Dobson and Tobias); (h) Theory of Turnover (I and II, Gofman); (i) Biophysics of Large Molecules (I and II, Gofman); (l) Radiation Effects at the Molecular Level (II, —); (n) Theoretical Biophysics (I and II, —); (p) Biological Optics (I, Dobson and Tobias); (q) Physiology of Circulation (I, Jones and Dobson).
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.)
Radiation Physiology. (See Physiology 108.)
Physical Biochemistry. (See Biochemistry 206A-206B.)

PHYSIOLOGY**A Department of the School of Medicine**

(Department Office, 2549 Life Sciences Building)

- Leslie L. Bennett, M.D., Ph.D., *Professor of Physiology (Chairman of the Department)*.
I. Lyon Chaikoff, M.D., Ph.D., *Professor of Physiology*.
Sherburne F. Cook, Ph.D., *Professor of Physiology and Lecturer in Optometry*.
James M. D. Olmsted, Ph.D., Sc.D., *Professor of Physiology*.
Hardin B. Jones, Ph.D., *Associate Professor of Physiology and Medical Physics*.
Benjamin Libet, Ph.D., *Associate Professor of Physiology*.
Nello Pace, Ph.D., *Associate Professor of Physiology*.

Ralph H. Kellogg, M.D., Ph.D., *Assistant Professor of Physiology.*

Adrienne A. Batts, M.D., Ph.D., *Associate in Physiology.*



Spencer W. Brown, Ph.D., *Assistant Professor of Genetics and Lecturer in Physiology.*

Ernest L. Dobson, Ph.D., *Lecturer in Physiology.*

Ellsworth C. Dougherty, Ph.D., M.D., *Lecturer in Physiology.*

Dorothy H. Eichorn, Ph.D., *Lecturer in Physiology for the fall semester.*

Harold T. Gordon, Ph.D., *Lecturer in Physiology and Assistant Professor of Entomology.*

Gordon L. Walls, Sc.D., *Lecturer in Physiology and Professor of Physiological Optics and Optometry.*

Letters and Science List.—All undergraduate courses in physiology are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Pace.

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, subjects to the approval of the major adviser.

Students will be required to have at least a 1.5 grade-point average in courses taken to satisfy the major requirements in physiology.

For fees charged in the School of Medicine, see the ANNOUNCEMENT OF THE SCHOOL OF MEDICINE.

LOWER DIVISION COURSES

1. Introductory Physiology. Lectures. (3) I. Mr. Cook
Prerequisite: either high school chemistry or at least 4 units of college physics or biology. Not open to entering freshmen.
- 1L. Introductory Physiology. Laboratory. (2) I. Mr. Cook
Prerequisite: course 1 (may be taken concurrently).
Each laboratory section will be limited to ninety students.

UPPER DIVISION COURSES

- 100A-100B. General Physiology. (3-3) Yr. Mr. Pace
Prerequisite: Chemistry 1A-1B, 8; Physics 2A-2B; course 1-1L, or Zoölogy 1A-1B, or Botany 1. Recommended: Mathematics 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. Bennett, Mr. Chaikoff, Mr. Olmsted, Mr. Libet, Mr. Kellogg, and Assistants
Lectures, laboratory, and conferences or demonstrations.
Prescribed for, and limited to, students in the first year of the School of Medicine. (See ANNOUNCEMENT OF THE SCHOOL OF MEDICINE for statement concerning fees.)

102. Physiology of Growth and Development in the Child. (2) I. Mrs. Eichorn
Prerequisite: course 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 instructor. Not open to students who have taken course 110B.
106. History of Human Physiology. (2) I. Mr. Olmsted
Lecture and reports.
Prerequisite: upper division standing and a laboratory course in one of the following: physiology, biochemistry, anatomy, zoölogy.
107. Environmental Physiology. (3) II. Mr. Pace, Mr. Cook
Prerequisite: course 1, or Zoölogy 1A-1B, or consent of instructor.
Lectures on the physical, chemical, and biotic influences of the environment on man, and the adaptive changes in response to environment.
108. Radiation Physiology. (3) II. Mr. Jones, Mr. Dobson
Prerequisite: Chemistry 1A-1B, Physics 2A-2B, and course 1-1L, or Zoölogy 1A-1B.
Lectures on the physiological effects of radiation.
- 110A-110B. Mammalian Physiology. (3-3) Yr. Mr. Bennett, Mr. Chaikoff, Mr. Olmsted, Mr. Libet, Mr. Kellogg
Prerequisite: course 1-1L or Zoölogy 1A-1B, Physics 2A-2B, Chemistry 1A, 8. Zoölogy 1A may be substituted for courses 1-1L with consent of instructor.
A comprehensive survey of mammalian physiology.
112. Mammalian Physiology. Laboratory. (3) II. Mr. Bennett, Mr. Chaikoff, Mr. Olmsted, Mr. Libet, Mr. Kellogg, 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 instructor.
- *120A. Comparative Physiology. (3) II. 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) I. 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.

* Not to be given, 1953-1954.

199. Special Study for Advanced Undergraduates. (1-4) I and II.
Mr. Bennett (in charge), Mr. Chaikoff, Mr. Cook, Mr.
Olmsted, Mr. Pace, Mr. Libet, and Mr. Kellogg
Prerequisite: at least 6 units of upper division courses in physiology.

GRADUATE COURSES

(Concerning conditions for admission to graduate courses, see page 10)

200. Seminar in Cell Physiology. (1) II. Mr. Pace
Prerequisite: courses 100A-100B and Chemistry 109.
Topics will vary from year to year, and emphasis will be placed on the
current literature.
- 201A-201B. Research. (2-8; 2-8) Yr.
Mr. Bennett (in charge), Mr. Chaikoff, Mr. Cook,
Mr. Olmsted, Mr. Pace, Mr. Libet, Mr. Kellogg
- 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.
207. Seminar in Environmental Physiology. (1) I and II.
Prerequisite: courses 107 and 110A-110B. Mr. Cook, Mr. Pace
Topics will vary from year to year. The program for 1953-1954 will
include seminars in (a) Physiological Effects of Space Flight (I, Pace);
(b) Physiological Effects of Heat and Cold (II, Cook).
220. Seminar in Comparative Physiology. (1) I. Mr. Cook
Prerequisite: courses 110A-110B and consent of instructor.
The topic for 1953-1954 will be announced.

PLANT NUTRITION

(Department Office, 3044 Life Sciences Building)

- Daniel I. Arnon, Ph.D., *Professor of Plant Physiology.*
James P. Bennett, Ph.D., *Professor of Plant Physiology.*
Perry R. Stout, Ph.D., *Professor of Plant Nutrition (Chairman of Depart-
ment).*
John S. Burd, B.S., *Professor of Plant Nutrition, Emeritus.*
Walter H. Dore, B.S., *Professor of Plant Nutrition, Emeritus.*
Louis Jacobson, Ph.D., *Associate Professor of Plant Nutrition.*



- Geoffrey B. Bodman, Ph.D., *Professor of Soil Physics.*
Hans Jenny, Sc.D., *Professor of Soil Chemistry and Morphology.*

Gordon Mackinney, Ph.D., *Professor of Food Technology.*
 Roy Overstreet, Ph.D., *Professor of Soil Chemistry.*
 Leonard Machlis, Ph.D., *Associate Professor of Botany.*
 Edward C. Stone, Ph.D., *Assistant Professor of Forestry.*
 John G. Torrey, Ph.D., *Assistant Professor of Botany.*



Theodore C. Broyer, B.S., *Lecturer in Plant Nutrition.*
 Eric E. Conn, Ph.D., *Lecturer in Plant Physiology.*

Letters and Science List.—Courses 115 and 117 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

UPPER DIVISION COURSES

115. The Nutrition of Green Plants. (2) I. Mr. Arnon
 Prerequisite: Botany 111.
 Evolution of modern concepts of plant nutrition; absorption, accumulation, assimilation, and functional aspects of inorganic nutrients; special phases of photosynthesis; nitrogen metabolism; effects of hydrogen ion; deficiency and toxicity diseases; certain relations of plant nutrition to animal nutrition.
117. The Nutrition of Green Plants Laboratory. (2) I. Mr. Jacobson
 Prerequisite: Chemistry 5, course 115 (taken concurrently if possible).
 Laboratory and greenhouse experiments in plant nutrition to accompany 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. Conn, Mr. Jacobson, Mr. Jenny, Mr. Overstreet
 Prerequisite: senior standing and consent of the major adviser.

RELATED COURSES IN ANOTHER DEPARTMENT

The Soil as a Medium for Plant Growth. (See Soil Science 110.)
 Soil Chemistry in Relation to Plant Growth. (See Soil Science 112 and 113.)

GRADUATE COURSES

- 201A-201B. Research. (1-9; 1-9) Yr.
 Mr. Arnon, Mr. Bennett, Mr. Bodman, Mr. Conn, 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. Jacobson (in charge), Mr. Arnon, Mr. Bennett, Mr. Conn, Mr. Machlis, Mr. Mackinney, Mr. Overstreet, Mr. Stout, Mr. Torrey
 Prerequisite: graduate standing and consent of the staff member in charge.
 Seminar in problems of plant physiology in the fields of botany, food technology, forestry, plant nutrition, and soil science.
 The spring semester of this seminar is listed under Botany 206.
- 235A-235B. Staff Seminar in Plant Nutrition. (No credit) Yr.
 The Staff (Mr. Arnon in charge)

PLANT PATHOLOGY

(Department Office, 107 Hilgard Hall)

- Peter A. Ark, Ph.D., *Professor of Plant Pathology.*
 Max W. Gardner, Ph.D., D.Sc. (hon.e), *Professor of Plant Pathology (Chairman of Department).*
 Hans N. Hansen, Ph.D., *Professor of Plant Pathology.*
 Thomas E. Rawlins, Ph.D., *Professor of Plant Pathology.*
 William C. Snyder, Ph.D., *Professor of Plant Pathology.*
 H. Earl Thomas, Ph.D., *Professor of Plant Pathology.*
 Cecil E. Yarwood, Ph.D., *Professor of Plant Pathology.*
 James T. Barrett, Ph.D., *Professor of Plant Pathology, Emeritus.*
 Ralph E. Smith, Sc.D., *Professor of Plant Pathology, Emeritus.*
 William N. Takahashi, Ph.D., *Associate Professor of Plant Pathology.*
 Stephen Wilhelm, Ph.D., *Assistant Professor of Plant Pathology.*
 Robert D. Raabe, Ph.D., *Instructor in Plant Pathology.*



- Leo J. Klotz, Ph.D., *Professor of Plant Pathology, Riverside.*
 A. Herbert Gold, Ph.D., *Lecturer in Plant Pathology.*

Departmental Major Adviser.—Mr. Rawlins.

Preparation for the Major.—See Plant Science curriculum, College of Agriculture, page 85, in the CIRCULAR OF INFORMATION. Zoölogy 1A or 10 and Soil Science 100, 110, or 106 must be included.

The Major.—Required: twelve units of Plant Pathology in addition to Plant Pathology 120. In satisfaction of part of this 12-unit requirement, related courses approved by the adviser may be accepted.

UPPER DIVISION COURSES

100. Forest Pathology. (3) II. Mr. Hansen
 Lectures and laboratory.
 Prerequisite: Botany I or 12 and 16. Restricted to forestry students.
 Diseases of forest plants.
120. Plant Diseases. (4) I. Mr. Yarwood, Mr. Raabe
 Lectures and laboratory.
 Prerequisite: Botany I 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. Gold, Mr. Takahashi
 Prerequisite: course 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 1954.
123. Principles of Plant Pathology. (2) II. Mr. Wilhelm, Mr. Thomas
 Prerequisite: course 120.
 A consideration of some of the principles broadly applicable to fungus, bacterial, virus, and nutritional diseases of plants.

- *125. Diseases of Truck and Field Crops. (2) I. Mr. Snyder, Mr. Gardner Laboratory.
Prerequisite: course 120 and junior standing in Plant Pathology.
The pathology of important crop plants. Dissemination, factors influencing 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. Rawlins (in charge), Mr. Gardner, Mr. Snyder, Mr. Hansen, Mr. Takahashi, Mr. Thomas, Mr. Ark, Mr. Yarwood, Mr. Wilhelm, Mr. Gold, Mr. Raabe

GRADUATE COURSES

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr.
The Staff (Mr. Gold in charge)
- 230A-230B. Research in Plant Pathology. (1-9; 1-9) Yr.
Mr. Gardner (in charge), Mr. Gold, Mr. Hansen, Mr. Rawlins, Mr. Snyder, Mr. Takahashi, Mr. Thomas, Mr. Ark, Mr. Yarwood, Mr. Wilhelm, Mr. Raabe

(GIVEN AT RIVERSIDE)

GRADUATE COURSES

- 201A-201B. Seminar in Plant Pathology. (1-1) Yr.
The Staff (Mr. Klotz in charge)
- 230A-230B. Research in Plant Pathology. (1-6; 1-6) Yr. Mr. Klotz

PLANT PHYSIOLOGY

(GIVEN AT RIVERSIDE)

GRADUATE COURSES

- 203A-203B. Research in Plant Physiology. (1-6; 1-6) Yr. Mr. Sinclair
- 205A-205B. Seminar in Plant Physiology. (1-1) Yr.
The Staff (Mr. Sinclair in charge)

POLITICAL SCIENCE

(Department Office, 202 South Hall)

- ¹Charles Aikin, LL.B., Ph.D., *Professor of Political Science.*
Eric C. Bellquist, Ph.D., *Professor of Political Science.*
Thomas C. Blaisdell, Jr., Ph.D., *Professor of Political Science and Director of the Bureau of International Relations.*
Joseph P. Harris, Ph.D., *Professor of Political Science.*
Albert Lepawsky, Ph.D., *Professor of Political Science.*
Leslie Lipson, Ph.D., *Professor of Political Science.*
Austin F. Macdonald, Ph.D., *Professor of Political Science.*
Samuel C. May, M.A., LL.B., *Professor of Political Science and Director of the Bureau of Public Administration.*

* Not to be given, 1953-1954.

¹ In residence fall semester only, 1953-1954.

- Peter H. Odegard, Ph.D., *Professor of Political Science (Chairman of the Department)*.
 Frank M. Russell, Ph.D., *Professor of Political Science*.
 Dwight Waldo, Ph.D., *Professor of Political Science*.
 David P. Barrows, Ph.D., LL.D., Litt.D., *Professor of Political Science, Emeritus*.
 Hans Kelsen, Ph.D., *Professor of Political Science, Emeritus*.
 P. Orman Kay, Ph.D., LL.D., *Professor of Political Science, Emeritus*.
 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*.
 Eugene L. Burdick, Ph.D., *Assistant Professor of Political Science*.
 Ernst B. Haas, Ph.D., *Assistant Professor of Political Science*.
 Norman Jacobson, Ph.D., *Assistant Professor of Political Science*.
 *George A. Lipsky, Ph.D., *Assistant Professor of Political Science*.
 Richard L. Park, Ph.D., *Assistant Professor of Political Science*.
 Victor Rosenblum, Ph.D., *Assistant Professor of Political Science*.
 Paul Seabury, Ph.D., *Assistant Professor of Political Science*.
 Harold Winkler, Ph.D., *Assistant Professor of Political Science*.



- Alford A. Carleton, Ph.D., *Visiting Professor of Political Science for the spring semester*.
 Hugh M. Clokie, Ph.D., *Lecturer in Political Science*.
²Rupert Emerson, Ph.D., *Visiting Professor of Political Science*.
 Julian Friedman, M.A., *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*.
 Boynton Kaiser, A.B., *Lecturer in Political Science*.
¹Frederick H. Lawson, Ph.D., *Visiting Professor of Political Science*.
 George Lenczowski, Ph.D., *Visiting Associate Professor of Political Science*.
 Leslie Grant McConnell, Ph.D., *Lecturer in Political Science*.
 Covey T. Oliver, A.B., LL.B., *Professor of Law*.
 Frank A. Pinner, A.B., *Lecturer in Political Science*.
 Joseph W. Rupley, B.S., *Lecturer in Political Science*.
 Richard F. Scott, J.D., *Lecturer in 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 7.

The American Institutions requirement may be satisfied by completing any one of the following courses in political science: 1, 100A, 101A, 102A, 104A, 105A, 157A, 157B, 163.

Departmental Major Advisers: Mr. Aikin, Mr. Burdick, Mr. Haas, Mr. Jacobson, Mr. Lipson, Mr. Macdonald, Mr. Mah, Mr. May, Mr. Scalapino, Mr. Towster, Mr. Winkler.

Preparation for the Major.—Students may be accepted in the major if they have at least a C average in the prerequisite courses, namely, Political Science 1 and 2, Economics 1A-1B, and one of the following History courses: 4A-4B, 17A-17B. Students whose major field of undergraduate concentration will

* Absent on leave, 1953-1954.

¹ In residence fall semester only, 1953-1954.

² In residence spring semester only, 1953-1954.

be in Group VI (Parties, Pressure Groups, and Public Opinion) or Group VII (Public Administration and Public Policy), or who wish to take a graduate degree, will be required to take a course in statistics approved by their departmental adviser. In addition, majors are strongly recommended to study allied subjects in the social sciences, and to that end are advised to include in the program of their freshman and sophomore years some of the following lower division courses: Anthropology 2A-2B; Geography 5A-5B; History 8A-8B; Philosophy 6A-6B; Psychology 1A; Sociology and Social Institutions 1, 2. Students who were accepted as majors under the plan in force until the year 1952-1953 will be permitted to continue with their programs as then approved.

Fields of Study.—Courses in the Department are grouped into the following fields: I. American Government; II. Political Theory; III. International Relations; IV. Comparative Government; V. Public Law and Jurisprudence; VI. Public Opinion, Parties, and Pressure Groups; VII. Public Administration and Public Policy. A major is required to select one of these for special emphasis.

The Major.—Candidates' programs must be submitted to a departmental adviser for approval. The department will certify to the completion of a major program for graduation upon fulfillment of the following requirements:

1. Completion of at least 24 units of upper division courses in the major, of which 18 units must be in political science. Six (6) upper division units taken in other departments may be accepted as a part of the major, provided they are related to the candidate's field of emphasis and have been approved by his departmental adviser.
2. Majors in the Department will include in their programs, normally in the junior year, four courses, one each from any four groups in the following list including the group emphasized:

- I. 101A, 102A
- II. 110A
- III. 123, 124
- IV. 141A, 141B, 144A
- V. 150A, 157A, 157B
- VI. 162A, 163
- VII. 181, 184

3. Students in Political Science must maintain a C average in the major.

Special Study Course.—In the senior year, students who have shown high attainment may pursue a systematic scheme of reading under the direction of some member of the Department. The maximum credit for this course (199) will usually not exceed 4 units in any semester.

LOWER DIVISION COURSES

1. Introduction to Government. (3) I and II. Mr. Odegard, Mr. Rosenblum
Two lectures and two section meetings per week.
An introduction to the principles and problems of government, with particular emphasis on national government in the United States. This course is accepted in satisfaction of the American Institutions requirement.
2. Introduction to Government (Comparative Government). (3) I and II.
Two lectures and two section meetings per week. Mr. Lipson
A comparative study of constitutional principles, governmental institutions, and political problems of selected national governments.

UPPER DIVISION COURSES

Nonmajors who plan to take upper division courses in political science are strongly advised to take courses 1 and 2. Lacking these, students with satis-

factory equivalents may be admitted to upper division courses with consent of the instructor.

Courses which are given the same number followed by letters "A," "B," "C," etc., may be taken independently unless otherwise indicated.

Group I—American Government

(Other courses in American Government, listed in other Groups, may also be regarded as belonging to Group I for the purposes of the program of the major: namely, 113, 128A, 128B, 157A, 157B, 158, 159, 175.)

- 100A. Government in the United States. (3) I. Mr. McConnell
(Formerly numbered 150.)
Not open to students who have taken course 1 or 151 (as formerly numbered).
A survey of the powers, structure, and operation of government at national, state, and local levels.
- 101A. Basic Factors in American Politics. (3) I. Mr. Waldo
(Formerly numbered 159.)
The constitutional-legal background of American political action; historical, social, and ideological factors affecting American politics; the politics of economic interests and geographical areas; emergent political patterns in the two-party system.
- 102A. State Government and Administration. (3) II. Mr. Macdonald
(Formerly numbered 172.)
Organization of state government; federal-state relations; elections and politics; the courts; county government; current administrative problems such as state finance, the merit system, regulation of business, the state and labor, conservation of natural resources, health, welfare, correction.
- 103A. Municipal Government and Administration. (3) I. Mr. Macdonald
(Formerly numbered 162.)
How cities are organized and what they are doing; municipal politics; relations of city and state; problems and activities of modern cities; traffic regulation, city and regional planning, zoning, police and fire protection, budget making; the war against crime.
- 104A. State and Local Government in California. (3) II. Mr. McConnell
An examination of the constitution; legislative, administrative, judicial and electoral systems of California; parties and interest groups; city and county government; California in national politics.
- *105A. The Legislative Process. (3) II. Mr. Harris
(Formerly numbered 154.)
A study of the organization and functioning of legislative bodies, with particular attention to Congress and state legislatures, functions; membership; committee system; executive-legislative relations; pressure groups; lobbying; movement for reform.

Group II—Political Theory

- 110A. Contemporary Issues and Political Theory. (3) I and II. Mr. Winkler
An inquiry into the theoretical aspects of political conflict: constitutionalism and dictatorship, democracy and authoritarianism, capitalism and socialism.

* Not to be given, 1953-1954.

- 111A. Principles of Political Theory. (3) II. Mr. Jacobson
(Formerly numbered 111.)
An analytical approach to problems of citizenship and authority from the standpoint of the individual, the group, and the state.
113. American Political Theory. (3) I. Mr. Jacobson
Basic problems of political theory as viewed within the context of American history and institutions.
- 115A. Development of Political Thought in the Far East. (3) I. Mr. Scalapino
(Formerly numbered 122.)
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.
- 116A. Soviet Political Theory. (3) I. Mr. Towster
(Formerly numbered 108.)
Prerequisite: course 141A-141B, or consent of instructor.
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.
- 118A-118B. History of Political Theory. (3-3) Yr. Mr. Burdick, Mr. Jacobson
I: 118A, Mr. Jacobson.
II: 118B, Mr. Burdick.
An examination of political theory from the Greeks to modern day. Key concepts such as idealism, pluralism, utilitarianism, socialism and revolution will be subjected to detailed analysis.

Group III—International Relations

123. International Politics. (3) I. Mr. Russell
Rise and development of the Western State system; problems of nationalism and imperialism, particularly in connection with the peace settlement following the Second World War.
124. International Organization. (3) II. Mr. Haas
The preservation of world peace through collective security arrangements. Analysis of the conditions under which International Organizations can or cannot preserve peace through examination of the record of the United Nations, League of Nations and more restricted security organizations.
125. Dependent Peoples and Trusteeship. (3) I. Mr. Haas
Colonial empires and the attempt to eliminate or to supervise them through International Organization. Comparisons between colonial administration with and without international supervision. The probable impact of international supervisory techniques on the future status of dependent areas.
- 126A-126B. International Administration. (3-3) Yr. Mr. Haas
126A. International cooperation in economic, social and humanitarian areas in an environment of competition and violence, 1815-1939.
126B. The preservation of peace through the raising of living standards; international welfare planning and world politics since 1945.

127. Theories of International Relations. (3) II. Mr. Russell
 Historical development and present range of political thought on relations between nations; origins and implications of the idea of sovereignty; the theory of an international community; theories of imperialism; Christian, Communist, and Fascist ideas; geopolitical theories.
- 128A. Recent American Foreign Policy. (3) I and II. Mr. Russell, Mr. Seabury
 (Formerly numbered 128.)
 I: Mr. Russell; II: Mr. Seabury.
 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.
- 128B. The Conduct of American Foreign Relations. (3) II. Mr. Bellquist
 (Formerly numbered 175.)
 Diplomacy and the conduct and control of foreign relations. The Department of State and the Foreign Service. Case studies in recent diplomacy to illustrate policy formation and execution. Some comparative materials will be introduced but emphasis will be placed upon the United States.
129. Nationalism. (3) II. Mr. Pinner
 The growth of national feeling and consciousness in the Western world. The new nationalism of dependent peoples. The psychological and social importance of national identifications. Differences in national ideologies. Effects of nationalistic thinking on governmental action. Nationalistic and nativistic movements—their origins, functioning, and life cycle.
- *131A. Foreign Policy of the Soviet Union. (3) II. ———
 (Formerly numbered 142.)
 The constant factors in Russian foreign policy. Policy of the early years as affected by Marxian ideology, internal conditions, and foreign interference. Period of truce and limited cooperation with the Western Powers. Effect of the breakdown of the League. The Second World War and aftermath.
- 133A–133B. Principles of International Law. (3–3) Yr. Mr. Scott
 The nature and sources of international law, its historical development, and its scope and function as a part of the contemporary legal system.
135. China in World Affairs. (3) I. Mr. Mah
 China as a nation in the Oriental World; impact of the Occident and its repercussions; internal and external aspects of the struggle for the creation of a modern democratic state; China in world politics.
- 136A. Latin America in World Affairs. (3) II. Mr. Macdonald
 (Formerly numbered 149.)
 Relations of Latin America with the United States and other world powers. Pan-Americanism and its relation to world organization. The future of Latin America in the community of nations.
- 137A. International Relations of the Middle East. (3) I. Mr. Lenczowski
 (Formerly numbered 189.)
 A study of politics and diplomacy of eleven independent states in the Middle East. Emphasis is laid on the interrelation of foreign and domestic politics.

* Not to be given, 1953–1954.

137B. Basic Strategic and Political Problems of the Middle East. (3) II.

Mr. Lenczowski

An analysis of those problems which transcend the limits of single countries, such as the position of the Middle East in world strategy and economics; supranational political movements; political concepts, techniques, and propaganda of major powers; global and regional security arrangements; and the role of international agencies in the area.

138A-138B. International Relations of the Far East. (3-3) Yr. Mr. Mah

It is strongly recommended that Part A be taken before Part B.

138A. A general survey to provide an essential background for the understanding of contemporary political events and developments in the area. (Formerly numbered 138.)

138B. An analysis of political issues of world significance and ramifications posed by the conflict of interests of the powers in the area. (Formerly numbered 136.)

138C. India and Pakistan in World Affairs. (3) I. Mr. Park

Policies of India and Pakistan in relation to each other, as members of the British Commonwealth, and of the United Nations. Their relations with the Great Powers.

*138D. Nationalism and Diplomacy in the Far East. (3) II. ———

(Formerly numbered 194.)

East Asian trade, investment, and diplomacy in the modern era. Rise of modern national states: Japan, China, Korea, and Southeast Asia. End-of-the-century diplomatic rivalries. The two World Wars. Economics and politics of twentieth-century Eastern nationalism. Postwar developments.

*139A-139B. Basic Problems of American Far Eastern Policy. (3-3) Yr.

(Formerly numbered 195A-195B.)

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.

*139C. American Role in the Far East. (3) I. Mr. Scalapino

(Formerly numbered 121.)

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.

Group IV—Comparative Government

141A-141B. Government in the Soviet Union. (3-3) Yr. Mr. Towster

Demographic, historical, and ideological bases of Soviet rule. The social and governmental structure. Nationalities and federalism. The Party. Trade unions and coöperatives. The church; army; courts, prosecutors and organs of police. Statics and dynamics of power in the U.S.S.R.

*141C. Government and Politics in Eastern Europe. (3) II. Mr. Towster

(Formerly numbered 130.)

The origins and nature of the present social and ethnic structures, governmental systems, and international position of the East European satellites. Primary emphasis upon the political evolution and status of the Soviet satellites.

* Not to be given, 1953-1954.

- 142A. Government and Politics in the Middle East. (3) I. Mr. Lenczowski
(Formerly numbered 188.)
A study of political institutions, traditions, and mores of the people of the Middle East in their geographical and cultural setting.
- 142B. Government and Politics of South Asia. (3) I. Mr. Park
The interrelation of nationalism and imperial policy in the independence movements in India, Pakistan and Ceylon; constitutional development; the formation of Pakistan and its consequences for South Asia; nationalist thought and institutions.
- 142C. Government and Politics of South Asia. (3) II. Mr. Park
The theory and practice of parliamentary government in India, Pakistan and Ceylon; political parties, constitutional law, economic planning, legislation; an evaluation of the institutional impact of British rule.
- 142D-142E. Political Institutions in Africa South of the Sahara. (3-3) Yr.
Mr. Friedman
142D: Survey and analysis of indigenous African political institutions and of the problems of the Africans in tribes, villages, towns and cities. European influence on African ways of life examined.
142E. British statecraft in Africa: nation-building, economic development, social progress, Dominion-colony relations, and international questions. Comparison with French, Portuguese, and South African colonial statecraft. (Formerly 197.)
- 142F. Evolution and Revolution in the Middle East. (3) II. Mr. Lenczowski
A study of the transformation of the traditional Moslem society into a modern society; the impact of democratic, Fascist, and Communist ideologies on the political attitudes in the area; liberal and anti-liberal trends in contemporary Islam; and a review of principal revolutionary experiments in the Middle East.
- 143A-143B. Revolutionary Process in the Far East. (3-3) Yr.
(Formerly numbered 132A-132B.) 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.
- 143C. Government and Politics in China. (3) II. Mr. Mah
Prerequisite: course 135 or equivalent.
China from Monarchy to Republic. China's republican experiment, its problems, failures and successes. China's internal politics and external relations under Communist rule.
- *143D. The Problem of Colonialism in the Far East. (3) II. Mr. Mah
(Formerly numbered 139.)
- *143E. Government, Politics, and External Relations of the Philippines. (3) II. (Formerly numbered 187.)
Annexation of the Philippines; political repercussions in the U. S. and influence on over-all U. S. Far Eastern policy. Independence movement; Jones Act of 1916; Tydings-McDuffie Act of 1934; formation of the Philippine Commonwealth. Constitution of the Philippines. Impact of the war years. Establishment of the independent Republic of the Philippines (1946). Problems of independence. External relations.

* Not to be given, 1953-1954.

- 144A. Government in Great Britain. (3) I. Mr. Lipson
 (Formerly numbered 144.)
 A study of the democratic process in Britain, as it operates through party politics and the machinery of government; the nature of the cabinet system; the functions undertaken by the state; and the gradualist blending of tradition and change.
- 144B. Government in the British Commonwealth. (3) II. Mr. Lipson
 (Formerly numbered 143.)
 The evolution of the British Commonwealth and changing status of its members; the internal politics of Australia, Canada, South Africa, and New Zealand: their similarities and differences.
145. Government and Politics in Japan. (3) II. Mr. Scalapino
 (Formerly numbered 145M.)
 How Japan is governed, with consideration of major changes in her basic political structure and policies under Allied military occupation.
- *146. Government and Politics of the Northern European Countries. (3) I. Mr. Bellquist
 Constitutionalism and parliamentarism in the countries of Northern Europe—Denmark, Finland, Iceland, Norway, and Sweden. Their constitutional history and present governmental systems. Social legislation in Scandinavia; foreign policies; inter-Scandinavian coöperation.
- 147A. Government and Politics in Western Europe: France and Italy. (3) I. Mr. Seabury
 A study of the experiments in democracy and the opposition to democracy in two countries sufficiently similar and sufficiently different to provide comparisons and contrasts.
- 147B. Government and Politics in Western Europe: Germany and Switzerland. (3) II. Mr. Seabury
 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.

Group V—Public Law and Jurisprudence

- 150A. Origins of Legal Institutions. (2) II. Mr. Scott
 (Formerly numbered 100.)
 The development and agencies of legal growth since primitive times and the interrelations between law and government. The early legal institutions of Europe and their influence on the modern juridical systems.
- 150B. Elements of Jurisprudence. (3) I. Mr. Scott
 (Formerly numbered 117.)
 Fundamental legal principles, especially from the analytical, historical, philosophical, and sociological points of view. Particular attention will be given to modern theories of the function of law.

* Not to be given, 1953-1954.

- 150C. British Legal Institutions. (2) I. Mr. Lawson
 A short introductory sketch on the constitutional structure of the Soviet United Kingdom, the Commonwealth and Empire. Judicial arrangements in England, Scotland and Northern Ireland. The legal profession. English and Scots Law. Contrasts with America will be emphasized.
- 151A-151B. Legal Order of a Communist State. (3-2) Yr. Mr. Guins
 151A. Foundations of the social and economic structure of the Soviet Union and its satellites. Soviet legal theory. Functions of law in a classless society. Principles of a People's Democracy. Social structure and its legal basis. Family law. Crime and punishment. Soviet justice. Principles of International Law.
 151B. Economic legislation of the Soviet Union and People's democracies. State Socialist property. Personal property and the sphere of economic freedom. Kolkhoses. Labor law. Penalties and rewards as incentives for work. Inheritance law. General appraisal of the universal monopoly of the state.
- 155A. Comparative Administrative Law. (3) I. Mr. Lawson
 Mainly the United States, England, and France, but reference will be made to other countries such as Germany, Italy, and Sweden. Rule making, excess and abuse of powers, bias, notice and hearing, remedies against public authorities, etc.
- *156. Administrative Law. (3) II. Mr. Aikin
 A study of the position of the executive branch of government in the American constitutional system, of the foundation of administrative power, of the area of judicial supervision of administration, and of the liability of public officers and of the state based on misuse of administrative power.
- 157A-157B. Constitutional Law of the United States. (3-3) Yr.
 Mr. Aikin, Mr. Rosenblum
 An examination of the structure of public power in American national, state, and local government.
 157A. The federal system; expansion of national authority; interstate barriers; separation of powers; admission of states to the Union; interstate compacts; constitutional amendments; treaties.
 157B. Rights of individuals; citizenship; suffrage; education; civil liberty; rights of accused; rights in war; slavery.
158. Government and Business. (3) I. Mr. Aikin
 A study of the basis of national and state control of industry and agriculture, and the extent to which government may control competition, maintain prices, protect home industries, prevent waste, establish quality standards, regulate conditions of labor, etc.
159. American Judicial Administration. (3) I. Mr. Rosenblum
 (Formerly numbered 177.)
 The organization and operation of American courts. Problems of jurisdiction, staffing, civil and criminal procedure.

Group VI—Parties, Pressure Groups, and Public Opinion

- 160A-160B. Pressure Groups and Political Power. (3-3) Yr.
 (Formerly numbered 140, 160, 163.) Mr. McConnell
 160A. The Government of the Private Association.
 An examination of the internal government and politics of the private

* Not to be given, 1953-1954.

association. Materials will be drawn from trade unions, the church, agricultural, business, professional, and other organizations. Special attention will be paid to the concepts of majoritarianism, constitutionalism, oligarchy, and constituency.

160B. Private Power and Public Policy.

The nature and sources, strategy and tactics of group power within the context of the American institutional setting. Business, agriculture, labor, religion, the professions as organized power. Ramifications for a democratic society.

- 161A-161B. Political Behavior. (3-3) Yr. Mr. Pinner
(Formerly numbered 161 and 165.)

The individual and group determinants of political belief and action. Political institutions considered in relation to individual and social values. The patterning of opinion and policy through interaction between groups.

- 162A. Public Opinion. (3) I. Mr. Bellquist
(Formerly numbered 114.)

An analysis of the nature of public opinion and propaganda in modern society. Major attention given to basic principles of communication and group behavior with emphasis on their political implications at home and abroad.

163. Political Parties. (3) II. Mr. Harris
(Formerly numbered 152.)

Nature and functions of political parties; their origin, development, structure, economic and social composition, internal management and control; relation of parties and pressure groups to legislation and administration; analysis of pressure politics as distinguished from party politics.

164. Problems in Public Opinion Analysis. (3) I. Mr. Pinner

Problems in analysis of voting behavior and other manifestations of public participation in politics. The conceptual tools and the techniques of research used in the analysis of political processes. Problems in the design and execution of research projects.

165. Soviet Propaganda. (3) II. Mr. Towster
(Formerly numbered 109.)

A critical analysis of the content and role of Soviet propaganda. Government control of the press, radio, and other media of communication. The nature of public opinion in the U.S.S.R. The main themes and stereotypes of internal and external propaganda.

Group VII—Public Administration and Public Policy

175. National Administration in the United States. (3) I. Mr. Lepawsky
(Formerly numbered 155.)

History, organization, personnel, business methods, and accomplishments of the departments of the administrative branch of the United States Government, with special reference to the development since 1933.

176. Recent National Policy. (3) II. Mr. Waldo

An analytical survey of the Federal government's relations to business, agriculture, labor, and the economy as a whole. Transportation, communication, and energy resources policies; and welfare programs. The government's foreign policies and national defense programs are excluded.

180. 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. Lepawsky
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. Lepawsky
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 INSTRUCTION

Admission to graduate work is limited to graduate students who have adequate undergraduate course preparation to participate in and benefit from such work. Admission to graduate courses or seminars is at the discretion of the instructor. See also page 10.

Unless otherwise stated, the first half (A) of any course or seminar is not prerequisite to the second half (B).

GRADUATE COURSES

201. Concepts of Political Philosophy. (2) I. Mr. Burdick
A review of philosophical method as it bears on the study of politics. Scientific method in the social sciences, nature of proof, value systems will be studied.
- 209A-209B. European Political Thought in the Nineteenth Century. (2-2) Yr. Mr. Winkler
An examination of the principal themes of political thought in England and on the Continent from the French Revolution to World War I.
229. Basic Factors in Foreign Policies of National States. (2) II. Mr. Russell
240. Recent Indian Political Thought. (2) II. Mr. Park
A study of modern Indian political and nationalist thought, with special reference to the influence of European ideas. Emphasis will be given to the contributions of Tilak, Gokhale, Aurobindo, Sapru, Tagore, Gandhi, J. Nehru, Subhas Bose, S. P. Mookerjee, J. P. Narayan, and M. N. Roy.

243. Problems of Comparative Government. (2) I. Mr. Lipson
An inquiry at an advanced level into the comparative study of politics and institutions, with emphasis upon the economic, geographic, cultural, and historical context within which the state operates.
- 261A-261B. Municipal Administration. (3-3) Yr. Mr. Graves
Techniques of municipal administration, with emphasis on the function, tools, and skills of management. Consideration of factors influencing the administrative process. Synthesis of theory and practice.
- 281A-*281B. Problems in Public Administration. (2-2) Yr. Mr. Harris
An advanced study of the theory and practice of public administration, with special emphasis upon organization and management, budgeting, and financial control.

GRADUATE SEMINARS

200. Bibliography and Research Methods in Political Science. (2) I. Mr. May
Governmental research as a focal point in the formulation of public policy and the utilization of existing information through the various social science disciplines.
205. Research in American Government. (2) II. Mr. Harris
211. American Political Theory. (2) II. Mr. Jacobson
Basic problems of political theory will be examined within the context of American political development.
- 212A-212B. European Political Theory. (2-2) Yr. Mr. Winkler
212A. A study of European political symbolism from literary, philosophical and anthropological sources.
212B. A study of significant political novels of the 19th and 20th centuries.
213. Theories of Imperialism. (2) I. Mr. Seabury
214. The Scope and Method of Political Science. (2) II. Mr. Jacobson
Politics as one among the social sciences. Contributions of history, anthropology, economics, and sociology as methods to the development of a science of politics.
224. Public Opinion. (2) II. Mr. Bellquist
226. Comparative Party Systems. (2) I. Mr. Clokie
The origin of political parties, with special reference to Britain; significance of party for constitutional and democratic government; experience with single party dictatorship and coalitions; the peculiarities of the two-party system, past and present; trends in political thought about party government.
- 228A-228B. Russian and Soviet Law. (2-2) Yr. Mr. Guins
Systematic study of the Soviet Constitution and the constitutions of the People's democracies. Conferences on particular problems of pre-revolutionary Russian law and Soviet law. Study of Soviet legal theory and Soviet interpretation of International Law.
- 230A-230B. American Foreign Policy. (2-2) Yr. Mr. Blaisdell
American military, economic, social and political policies toward various parts of the world. Normally, North Atlantic and South American countries are considered during the first semester and Asian and African countries during the second semester.

* Not to be given, 1953-1954.

- 231A-231B. International Organization. (2-2) Yr. Mr. Haas
Analytical studies of the ideologies and attitudes of political parties, pressure groups and elites with respect to the evolution of a consensus toward organization above the state level. The impact of organization on consensus is considered. Emphasis is placed on regional rather than universal trends.
- 232A-232B. International Relations. (2-2) Yr. Mr. Russell
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. International Law. (2-2) Yr. Mr. Oliver
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.
235. Problems of Government and Politics in Eastern Europe. (2) II.
Mr. Towster
- 236A-236B. Seminar in Major Problems of the Middle East. (2-2) Yr.
Mr. Lenczowski
A study of selected problems in politics, international relations, and political theory and institutions of Moslem and non-Moslem states in the area.
- *237. Changing Institutions in Postwar Japan. (2) I. _____
- 238A-238B. International Relations of the Far East and the Pacific Area. (2-2) Yr. Mr. Mah
- *239. Political, Economic, and Social Problems of Southeast Asia. (2) II. _____
241. Problems of Government in the U.S.S.R. (2) I. Mr. Towster
242. Constitutional, Political, and Administrative Problems of Dependent Areas. (2) I. Mr. Clokie
- 244A-244B. Contemporary Problems of Far Eastern Politics. (2-2) Yr.
Mr. Scalapino
A study of major problems of the contemporary Asian societies with particular relation to the broad political problems of the area as a whole.
- *245A-245B. Contemporary Political Problems of Japan. (2-2) Yr.
Mr. Scalapino
- *246. American Far Eastern Policy. (2) II. _____
Nineteenth- and early twentieth-century backgrounds. The two World Wars. United States' role in the postwar Far East.
- *247. Problems of India and Pakistan. (2) II. Mr. Park
Proseminar. Survey of major problems facing India and Pakistan, with special attention to political structure, social change, and economic development.
- 248A-248B. Comparative Government. (2-2) Yr. Mr. Bellquist
249. Research in Comparative Government. (2) II. Mr. Lipson

* Not to be given, 1953-1954.

- 250A-250B. Governments and International Relations of Latin America.
(2-2) Yr. Mr. Macdonald
Problems of government, politics, and administration in Latin America :
inter-American relations.
252. Some Basic Problems of Contemporary Colonialism. (2) II.
Mr. Emerson
253. Seminar in Comparative National Administration. (2) I. Mr. Waldo
Comparative studies of national administration in relation to constitu-
tional structures, economic systems, historical traditions, and cultural
patterns.
- *254. Administration and Technology. (2) Mr. Waldo
- 255A*-255B. Federal Administration. (2-2) Yr. Mr. Lepawsky
Special studies in problems of federal administration.
- 256A-256B. Federal Field Operations. (3-3) Yr. Mr. Rupley
A work-shop seminar in programs and management of the Federal
Government in the field. Each student will be assigned to make a recon-
naissance survey of a single Federal Agency in some breadth, requiring
approximately one-half day of field work per week.
- 257A-*257B. Constitutional and Administrative Law. (2-2) Yr. Mr. Aikin
Fundamental principles of constitutional law; leading cases; judicial
decisions affecting the liabilities, rights, duties, and procedure of govern-
mental officers and agencies.
258. Private Power and Public Policy. (2) I. Mr. Jacobson
Research into the nature and sources, strategy and tactics of group
power in the United States. Economic, religious and professional associa-
tions as organized power and its relationship to public policy.
- 259A-259B. American Politics. (2-2) Yr. Mr. Odegard
260. Jurisprudence. (2) I. Mr. Lawson
The emphasis will be mainly on the analysis of legal concepts such as
rights, duties and other fundamental legal conceptions, personality, own-
ership, possession, and the various types of obligation. Not theories of
sovereignty or law.
272. State Administration. (2) II. Mr. May
273. Public Personnel Administration. (2) II. Mr. Kaiser
Techniques and problems in the field of public personnel administration
with special reference to federal, state, and local agencies.
280. Administrative Theory. (2) II. Mr. Waldo
- 285A-285B. Regional Planning and Resources Management. (2-2) Yr.
Mr. Lepawsky

COURSES COMMON TO ALL GROUPS

199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Aikin in charge fall semester,
Mr. Lipson in charge spring semester)
298. Individual Study. (1-4) I and II. The Staff (Mr. Harris in charge)

* Not to be given, 1953-1954.

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, located in the Library Annex, was established by the University in 1921. It provides facilities for upper division and graduate students and members of the faculty to pursue study and research in the field of international law and relations. Among other primary sources, it contains a complete set of official documents of the League of Nations, including its Treaty Series, the Publications of the Permanent Court of International Justice, and the documentation of the United Nations. In addition to the documentary collection, the Library has many important secondary works dealing with current international problems, a number of outstanding American and foreign periodicals, and certain American and English newspapers regarded as most useful in the field.

Further information may be obtained from the office of the Bureau, Room 376 Library Annex, or from the Library of the Bureau, Room 388 Library Annex.

POMOLOGY

Warren P. Tufts, Ph.D., *Professor of Pomology (Chairman of the Department), Davis.*

William H. Griggs, Ph.D., *Associate Professor of Pomology, Davis.*

2. Principles of Fruit Growing. (3) I. Mr. Griggs
Prerequisite: Botany I or 12.

An introduction to the principles underlying the behavior of fruit trees, their response to environment and cultural operations.

POULTRY HUSBANDRY

(Department Office, 100 Poultry Husbandry Laboratory)

Samuel Lepkovsky, Ph.D., *Professor of Poultry Husbandry.*

I. Michael Lerner, Ph.D., *Professor of Poultry Husbandry.*

George F. Stewart, Ph.D., *Professor of Poultry Husbandry (Chairman of Department), Davis.*

Lewis W. Taylor, Ph.D., *Professor of Poultry Husbandry.*

Charles R. Grau, Ph.D., *Associate Professor of Poultry Husbandry (Vice-Chairman of the Department).*

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. 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.
198. Directed Group Study. (1-2) II. Mr. Taylor
Prerequisite: senior standing and consent of instructor.
Group study of methods employed in poultry production and management.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Taylor in charge)
Prerequisite: Poultry Husbandry 1, courses basic to the problems elected, and consent of instructor.
Problems may be elected relating to the nutrition, breeding, incubation, physiology, or egg and meat quality of chickens.
- Poultry Farm Finance. (See Agricultural Economics 110.)

GRADUATE COURSE

- 200A-200B. Research in Poultry Husbandry. (1-6; 1-6) Yr.
Mr. Grau, Mr. Lepkovsky, Mr. Lerner, Mr. Taylor

PSYCHOLOGY

(Department Office, 1023 Life Sciences Building)

- 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).*
- Egon Brunswik, Ph.D., *Professor of Psychology.*
- Richard S. Crutchfield, Ph.D., *Professor of Psychology.*
- Edwin E. Ghiselli, Ph.D., *Professor of Psychology.*
- Harold E. Jones, Ph.D., *Professor of Psychology and Director of the Institute of Child Welfare.*
- David Krech, Ph.D., *Professor of Psychology.*
- Jean Walker Macfarlane, Ph.D., *Professor of Psychology.*
- Donald W. MacKinnon, Ph.D., *Professor of Psychology and Director of the Institute of Personality Assessment.*
- *R. Nevitt Sanford, Ph.D., *Professor of Psychology.*
- Edward C. Tolman, Ph.D., *Professor of Psychology.*
- Robert Choate Tryon, Ph.D., *Professor of Psychology.*
- Warner Brown, Ph.D., *Professor of Psychology, Emeritus.*
- 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.*
- Rheem F. Jarrett, Ph.D., *Associate Professor of Psychology.*
- Leo J. Postman, Ph.D., *Associate Professor of Psychology.*
- Benbow F. Ritchie, Ph.D., *Associate Professor of Psychology.*

* Absent on leave, 1953-1954.

- Theodore R. Sarbin, Ph.D., *Associate Professor of Psychology.*
 Alex C. Sherriffs, Ph.D., *Associate Professor of Psychology.*
 Read D. Tuddenham, Ph.D., *Associate Professor of Psychology.*
 Hubert S. Coffey, Ph.D., *Associate Clinical Professor of Psychology.*
 Audrey Schumacher, Ph.D., *Associate Clinical Professor of Psychology.*
 Ralph R. Canter, Ph.D., *Assistant Professor of Psychology.*
 Richard L. Cutler, Ph.D., *Assistant Professor of Psychology.*
 Harrison G. Gough, Ph.D., *Assistant Professor of Psychology.*
 John P. McKee, Ph.D., *Assistant Professor of Psychology.*
 Donald A. Riley, Ph.D., *Assistant Professor of Psychology.*
 Mark R. Rosenzweig, Ph.D., *Assistant Professor of Psychology.*
 Donovan B. Morrison, A.B., *Associate in Psychology.*



- Edward N. Barnhart, Ph.D., *Lecturer in Psychology and Associate 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 Medical Psychology.*
 Mary C. Jones, Ph.D., *Lecturer in Psychology and Associate Professor of Education.*
 Catherine Landreth, Ph.D., *Lecturer in Psychology and Associate Professor of Home Economics.*
 Carl R. Rogers, Ph.D., *Visiting Professor of Psychology for the fall semester.*

Letters and Science List.—All undergraduate courses in this department except 3, 104, 114, 116, 117, 180, 185, and 186 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Coffey, Mr. Gough, Mr. Rosenzweig, 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 or 130

Abnormal Psychology: courses 160, 168

¹ In residence fall semester only, 1953-1954.

Clinical Psychology: courses 162, 165
 Developmental Psychology: courses 112 and 113 or 114
 Differential Psychology: courses 146A and 146B or 165
 Experimental Psychology: courses 106A and 130 or 131
 History and Systems of Psychology: courses 120, 126
 Industrial Psychology: courses 185 and 187 or 188
 Personality: course 148A-148B, or courses 136 and 141
 Physiological Psychology: course 108A-108B
 Social Psychology: courses 145 and 142A or 142B
 Tests and Measurements: courses 186 and 104 or 165

List of courses in other departments acceptable as part of the major in psychology:

Anatomy 102, 103
 Business Administration 151
 Economics 106A-106B, 150, 152, 180
 Education 110, 116, 153, 154, 161, 164
 Genetics 100, 102
 Home Economics 132, 133, 142
 Optometry (Physiological Optics) 105B, 106B
 Political Science 181, 183
 Social Welfare 106
 Speech 117A-117B, 118, 119
 Zoölogy 114, 115

Any upper division course in:

Anthropology
 Mathematics
 Philosophy
 Physiology
 Sociology and Social Institutions.

The department will certify to the completion of the major program for graduation only on the basis of at least a C average in the upper division courses included in the major. Students who do not maintain such an average may be required at any time to withdraw from the major in psychology.

Honor Students.—Honors are granted on the basis of the whole record of the student.

LOWER DIVISION COURSES

- 1A. General Psychology. (3) I and II. Mr. Crutchfield, Mr. Haire
 Three lectures and one section meeting per week. Not open to entering freshmen.
 The sequence 1A-1B or 1A-33 will be accepted in fulfillment of requirement (e) for the degree of Associate in Arts.
- 1B. General Psychology. (3) I and II. Mr. C. W. Brown, Mr. Morrison
 Prerequisite: course 1A.
 Two lectures and one three-hour laboratory per week.
 A continuation of course 1A with a detailed treatment of the application of the scientific method in the study of behavior. Basic assumptions, limitations, and advantages of the method of experiment. Intended primarily for prospective major students.
- *3. Introduction to Applied Psychology. (3) II. Mr. Ghiselli
 Prerequisite: sophomore standing.
 A survey of psychological problems occurring in the setting of daily

* Not to be given, 1953-1954.

life, particularly vocational choice; personal adjustment and efficiency; employee selection, training, motivation, and labor relations; advertising, selling, and market research; public opinion measurement; safety; mental hygiene; law; and medicine.

5. Introduction to Psychological Measurements. (3) I and II.

Mr. Tryon, Mr. Jarrett

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. Ritchie, Mr. Riley, Mr. Coffey

Two lectures and one two-hour laboratory section per week.

Prerequisite: courses 1A, 1B, and 5.

A comprehensive survey of the fundamentals of general psychology at an advanced level. Consideration of the facts and principles of behavior which form a common basis for the various special fields of psychology.

*101A-101B. Methods of Psychology. (3-3) Yr.

Mr. Jarrett, Mr. Riley

Lectures and laboratory.

Prerequisite: courses 1A, 1B, 5, and consent of instructor. Restricted to major students.

Exercises in the application of experimental and statistical methods to problems in the various areas of specialization in psychology. Formulation of problems, research design, control of variables, treatment of data, evaluation and interpretation of results.

102A-*102B. Advanced General Psychology. (3-3) Yr.

Mr. Tolman

Prerequisite: consent of instructor. Restricted to major students.

102A will be offered in the spring semester.

A consideration of the basic psychological processes of motivation, perception, learning, thinking, and emotion, as exhibited in behavior and consciousness and as modified by differences in capacity and in individual and social experience. Lectures, demonstrations, and class discussions.

*104. Principles of Test Construction. (3) I.

Mr. Ghiselli

Lectures and demonstrations.

Prerequisite: courses 1A, 1B, and 5 or an equivalent course in statistics.

Methods of constructing and validating psychological tests and scales, devising adequate criteria, principles of item construction, item reliability and validity, determining optimal scoring and weighting, devising relative and absolute scales.

* Not to be given, 1953-1954.

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 in methods of experimentation.
- *106B. Experimental Psychology. (3) I and II. _____
Lectures and four hours of laboratory to be arranged.
Individual laboratory problems.
107. Advanced Statistical Methods in Psychology. (3) I. Mr. Jarrett
Lectures and laboratory.
Prerequisite: course 5 or an equivalent course in statistics.
Reference points and units of measurement, correlation, reliability and validity, scoring of individual achievement, partial and multiple correlation, construction of scaled tests, representation of learning functions.
- 108A-108B. Physiological Psychology. (3-3) Yr. Mr. Rosenzweig
Lectures and laboratory.
Prerequisite: courses 1A, 1B, 5, and Physiology 1 or consent of instructor.
109. Representative Design of Psychological Experiments. (3) II. Mr. Brunswik
Prerequisite: senior or graduate standing, and either 106A and 107, or 101A-101B completed or in progress, or equivalent preparation in experimental and statistical methods.
Theory and application of experimental designs particularly suited to the problems of psychology, with special emphasis on examples from physical and social perception.
111. Child Psychology. (2) I. 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
Prerequisite: courses 1A, 1B, and 5.
Primarily for majors in psychology; majors in closely related departments will be admitted by consent of the instructor. Not open to students who have taken course 111 or Home Economics 132.
The development of motor functions, social and emotional traits, language, and mental abilities. Individual differences in development and performance, as related to physical, social, and psychological factors.
113. Adolescence. (2) II. Mr. Jones
Prerequisite: courses 1A, 1B, and 5. Primarily for majors in Psychology.
A survey of current research, with particular reference to the analysis and interpretation of data from growth studies.

* Not to be given, 1953-1954.

- 113N. Adolescent Psychology. (2) II. Mr. McKee
Prerequisite: course 1A and one other course in psychology.
A survey of adolescent development and the problems of adolescents.
This course is for non-majors; it is not open to students who have taken Psychology 113.
114. Laboratory in Child Study. (2) II. Mr. McKee
One hour of lecture and three hours of laboratory to be arranged.
Prerequisite: courses 1A, 1B, and 5.
Experience is given in specific observational and test procedures and in the collection and analysis of records for individual studies of young children.
115. Laboratory in Adolescent Development. (1) II. Mr. Jones
Three hours to be arranged.
Prerequisite: consent of instructor.
Offered to a limited number of students also enrolled in course 113.
Individual projects and reports.
116. Tests and Measurements of Infants and Preschool Children. (1) I. Miss Bayley
Prerequisite: courses 5 and 112 or Home Economics 132.
Instruction in the most commonly used techniques of measurement of physical, motor, and mental development, with evaluation and interpretation of test scores and measures of infants and young children.
117. Laboratory Tests and Measurements of Infants and Preschool Children. (2) I. Miss Bayley
Prerequisite: consent of instructor.
Laboratory work at the Institute of Child Welfare, accompanying course 116.
120. Introduction to History and Systems of Psychology. (3) II. Mr. Postman
Prerequisite: course 1A and at least 12 upper division units in psychology, or graduate standing in philosophy, biology, or sociology.
Major stages in the emergence of psychology as an independent science from its beginnings in ancient philosophy and medicine to the present. Classical nineteenth-century structuralism will be compared with such modern schools as functionalism, behaviorism, Gestalt psychology, and psychoanalysis.
- *126. Contemporary Psychology. (3) II. _____
Prerequisite: courses 1A, 1B, and at least 6 upper division units in psychology. Primarily for seniors.
Reading and discussion of current books and monographs, affording a survey of contemporary aims, methods, and achievements.
130. Learning. (3) I. Mr. Postman
Survey of experimental and theoretical work in the psychology of memory and learning.
131. Perception. (3) II. Mr. Brunswik
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.

* Not to be given, 1953-1954.

134. Motivation. (3) I. Mr. Tolman
 Prerequisite: courses 1A, 1B, and at least 6 upper division units in psychology. Primarily for seniors and graduates.
 The nature of primary and secondary drives; the theories concerning drives found in animal, child, experimental, social, and abnormal psychology, and in philosophy.
- *135. Thinking. (3) II. Mr. 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) II. Mr. Sarbin
 Prerequisite: courses 1A, 1B, and senior standing.
 A consideration of the social and cultural determinants of personality.
- *142A-142B. Experimental Society Psychology. (3-3) Yr. Mr. Ballachey, Mr. Tryon
 Prerequisite: courses 1A, 5, and 145, or equivalents, and consent of instructor.
 142A. The design of experiments in social psychology utilizing the social survey methodology.
 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.
- *144. Social Psychology of the Interview. (3) II. Mr. Ballachey
 Lectures and laboratory.
 Prerequisite: courses 1A and 145 or consent of instructor.
 Processes of communication in interview techniques used in the social sciences, with special reference to distortions arising from differences in psychosociological frames of reference of the participants.
145. Social Psychology. (3) I. Mr. Kreeh
 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.
 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 instructor.
- 148A-148B. Personality. (3-3) Yr. Mr. Rogers, ———
 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.

* Not to be given, 1953-1954.

- 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 instructor.
160. Mental Deficiency. (3) I. Miss Bridgman
Prerequisite: course 1A and upper division standing.
Mental deficiency and abnormality in children, including a consideration of tests used in clinical examinations.
161. Personality Development. (3) II. Mrs. Schumacher
Prerequisite: senior standing; either course 111, 112, 113, 160, or Home Economics 132. Limited to nonpsychology majors.
A survey of biosocial factors in the dynamics of normal personality development.
Students may not obtain credit for both 161 and 162.
162. Clinical Psychology. (3) I. Mrs. Macfarlane
Prerequisite: courses 1A, 1B, 5 or equivalent, and either course 112, 113, 160, 168.
Dynamics of personality development with special reference to clinical methods and problems. Limited to psychology majors.
Students may not obtain credit for both 161 and 162.
- *165. Introduction to Clinical Methods. (3) II. _____
Prerequisite: courses 1A, 1B, and 5.
A consideration of the methods and procedures of clinical diagnosis. Historical development of psychometric theory. Description and evaluation of the principal tests of ability and personality.
168. Abnormal Psychology. (3) II. Miss Bridgman
Prerequisite: course 1A and at least 6 units of upper division psychology or, with consent of instructor, premedical status.
The relations of abnormal traits to the psychoneuroses and psychoses; the appearance of abnormal traits in incipient stages of mental disturbance.
180. Psychological Aspects of Advertising and Marketing. (3) I. 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. Mr. Ghiselli, Mr. Canter
Prerequisite: course 1A.
A discussion of techniques for the selection and classification of employees, the psychological aspects of the study of work methods, conditions of work, training, employee motivation, and morale.

* Not to be given, 1953-1954.

186. Individual Appraisal and Occupational Analysis. (3) II. Mr. Ghiselli
Lectures and laboratory.
Prerequisite: courses 1A, 1B, 5.
Theories and principles of differences among individuals relevant to industrial problems; concepts and methods in occupational analysis classification.
187. Human Relations in Industry. (3) II. Mr. Canter
Prerequisite: course 185.
The motivation of workers, psychological aspects of worker-management relationships, factors in employee morale, the maladjusted worker, leadership.
188. Attitudes and Perception in the Industrial Society. (3) I. Mr. Haire
Prerequisite: courses 1A, 1B, and 5.
Theoretical problems of perceptual and attitudinal organization in industrial situations, role perceptions in labor and management relations, genesis of attitudes, morale surveys and similar problems.
199. Special Study for Advanced Undergraduates. (1-5) I and II. The Staff
By permission, honor students who are adequately prepared may carry on study or research under the guidance of a member of the department.

GRADUATE COURSES AND SEMINARS

Full graduate status in psychology and consent of the instructor are prerequisite to all graduate offerings. Graduate students in neighboring fields may participate in certain courses or seminars by consent of the instructor.

There will be a general colloquium of staff and graduate students which will be scheduled as the situation warrants. There will be no credit offered for these meetings.

- †204E. Seminar in Principles of Measurement. (2) I and II.
Mr. C. W. Brown, Mr. Jarrett
- 206E. Seminar in Experimental Psychology. (2) I and II.
Mr. Riley, Mr. Postman
Limited to students who are engaged in experimental work.
207. Quantitative Methods in Psychology. (3) II. Mr. Jarrett
A discussion of quantitative research methods in psychology. Principles necessary to the understanding and use of rational and empirical 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. Mr. Tuddenham
- *212E. Seminar in Developmental Psychology. (2) I.
Mr. Jones, Mrs. Jones, Mr. McKee

* Not to be given, 1953-1954.

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

228. The Conceptual Framework of Psychology. (3) I. Mr. Brunswik
Prerequisite: course 120 or any acceptable course in history or systems of psychology. Graduate students in philosophy, sociology, biology, or physics may be admitted by consent of the instructor.
Further discussion of history and systems of psychology, with special emphasis on the philosophy of science as applied to psychology. Introspective and objective, molecular and molar, peripheral and central-distal point of view. The status of theory in modern psychology; description versus explanation, idiographic versus statistical versus nomothetic approach.
- 231E. Seminar in Perception. (2) I. Mr. Brunswik
Prerequisite: consent of instructor.
Discussion of published or current work on the cognitive aspects of perception.
- †235E. The Nature of Psychological Change. (2) I. Mr. Sherriffs
Examination of the basic principles applicable to the major categories of psychological change such as learning and problem solving, personality restructuring, and modification of social patterns. Critical evaluation of the constructs available for the study of such change will be undertaken.
- 239E. Social Perception. (2) I. 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.
- *240E. Seminar in Personality Tests and Assessment Methods. (2) II. Mr. Gough
Prerequisite: graduate standing; course in personality testing; consent of instructor.
Critical review and evaluation of personality tests and assessment methods.
- 241E. Seminar in Personality and Culture. (2) II. Mr. Sarbin
Prerequisite: graduate standing.
Lecture and discussion of problems and theoretical formulations encountered in the study of social and cultural determinants of personality organization.
- *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.

* Not to be given, 1953-1954

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

246E. Perception and Personality. (2) II.

Mrs. Frenkel-Brunswik, Mr. Krech

An examination of current theory of perceptual and cognitive processes with special attention to these processes as aspects of the personality structure of the individual. Emphasis will be on the experimental approach.

247. Advanced Group Dynamics and Group Therapy. (3) I. Mr. Coffey

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. Mr. Coffey

248E. Seminar in Personality. (2) I.

Mr. Rogers

*249. Experimental Psychodynamics. (3) II.

Mr. Sarbin

Two hours of lecture and four hours of laboratory work per week to be arranged.

A general survey of the psychodynamics of behavior, with special emphasis upon the experimental literature.

249E. Seminar in Dynamic Psychology. (2) I.

Mr. MacKinnon

250E. Seminar in Animal Psychology. (2) I and II.

Mr. Ritchie, Mr. Tolman

261A-261B. Clinical Methods. (3-3) Yr. Mr. Tuddenham, Mr. Cutler

Lecture and laboratory; four hours of field work to be arranged.

Consideration of clinical methods of measurement, interview, and observation.

263A-263B. Advanced Clinical Diagnostic Testing. (3-3) Yr.

Mr. Gough, Mr. Cutler

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. Mr. Sarbin, Mr. Coffey

Prerequisite: course 261B.

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) II.

Mrs. Schumacher

Prerequisite: course 264F.

A critical survey of the major theories upon which psychotherapy is based.

*267E. Seminar in Medical Psychology. (2) II.

†268E. Seminar in Abnormal Psychology. (1) I and II. Miss Bridgman

269E. Seminar in Clinical Research Methods. (2) I and II. Mrs. Macfarlane

* Not to be given, 1953-1954.

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

- 285E. Seminar in Applied and Industrial Psychology. (2) II. Mr. Ghiselli
- 287E. Seminar in Psychology of Human Relations. (2) I. Mr. Canter
The role of psychology in the field of human relations with emphasis upon experimental and other methodological approaches.
298. Proseminar in Research Methods. (2) I.
Mr. Ghiselli, Mr. Krech, Mr. MacKinnon
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) I.
Mr. Crutchfield
Critical approach to presentation of psychological material in publications, lectures, demonstrations, etc., with emphasis on content, evidence, and significance of material, and relevant techniques of presentation.

PUBLIC HEALTH

(Department Office, 216 Building T-4)

- Margaret Beattie, M.A., Gr.P.H., *Professor of Public Health.*
- Jessie M. Bierman, M.D., M.S.P.H., *Professor of Maternal and Child Health.*
- Vera S. Fry, R.N., A.M., Ed.D., *Professor of Nursing Administration.*
- Harold B. Gotaas, Sc.D., *Professor of Sanitary Engineering.*
- *Dorothy Bird Nyswander (Dorothy Nyswander Palmer), Ph.D., *Professor of Public Health.*
- William C. Reeves, Ph.D., M.P.H., *Professor of Epidemiology.*
- Edward S. Rogers, M.D., M.P.H., *Professor of Public Health and Medical Administration.*
- Charles Edward Smith, M.D., D.P.H., *Professor of Public Health (Chairman of the Department).*
- Jacob Yerushalmy, Ph.D., *Professor of Biostatistics.*
- Robert T. Legge, Ph.G., M.D., F.A.C.S., *Professor of Hygiene, Emeritus.*
- William Griffiths, Ph.D., *Associate Professor of Public Health.*
- Nell F. Hollinger, Ph.D., *Associate Professor of Public Health.*
- Edith M. Lindsay, Ed.D., *Associate Professor of Public Health.*
- Walter S. Mangold, B.S., *Associate Professor of Public Health.*
- William W. Stiles, M.D., M.P.H., *Associate Professor of Public Health.*
- Bernard D. Tebbens, Sc.D., *Associate Professor of Industrial Hygiene Engineering.*
- Edwin S. Crosby, M.S., Ph.D., *Assistant Professor of Public Health and Sanitary Science.*
- Warren J. Kaufman, M.S., Sc.D., *Assistant Professor of Sanitation and Sanitary Engineering.*
- Chin Long Chiang, M.A., *Instructor in Public Health.*
- Calvin Zippin, Sc.D., *Instructor in Public Health.*
- Elizabeth B. Austin, A.B., *Associate in Public Health.*

* Absent on leave, 1953-1954.

Dorothy L. Chandler, M.P.H., *Associate in Public Health.*
 William R. Gaffey, A.B., *Associate in Public Health.*
 Jerome Grossman, M.P.H., *Associate in Public Health.*
 Flora J. Hanks, R.N., A.B., *Associate in Public Health.*
 Sandra C. Howell, M.P.H., *Associate in Public Health.*
 Richard K. Lansing, M.P.H., *Associate in Public Health.*
 Marian E. Leach, M.P.H., *Associate in Public Health.*
 Morgan J. Morley, M.P.H., *Associate in Public Health.*
 Charles R. Nicewonger, M.A., *Associate in Public Health.*
 William D. Simmons, M.P.H., *Associate in Public Health for the spring semester.*

Susan A. Simons, M.P.H., *Associate in Public Health.*
 Richard V. Walker, M.P.H., *Associate in Public Health.*



Lewis W. Hackett, M.D., Dr.P.H., *Visiting Professor of Public Health.*
 Rodney R. Beard, M.D., M.P.H., *Clinical Professor of Occupational Health.*
 Richard J. Stull, A.B., *Clinical Professor of Hospital Administration.*
 Charles H. Hine, Ph.D., M.D., *Associate Clinical Professor of Public Health.*
 Mortimer A. Benioff, M.D., *Lecturer in Public Health.*
 Dwight M. Bissell, M.A., M.D., M.S.P.H., *Lecturer in Public Health.*
 Henrik L. Blum, M.D., M.P.H., *Lecturer in Public Health.*
 Lester Breslow, M.D., *Lecturer in Public Health.*
 Harold D. Chope, M.D., Dr.P.H., *Lecturer in Public Health.*
 Bennett J. Cohen, D.V.M., Ph.D., *Lecturer in Public Health.*
 Robert Dyar, M.D., Dr.P.H., *Lecturer in Public Health.*
 Seymour M. Farber, M.D., *Lecturer in Public Health.*
 Charles B. Frasher, M.A., M.Ed., *Lecturer in Public Health.*
 Fern E. French, M.A., *Lecturer in Public Health.*
 David Frost, M.D., M.P.H., *Lecturer in Public Health.*
 George L. Hall, LL.B., *Lecturer in Public Health.*
 Floyd W. Hartmann, Sc.D., *Lecturer in Public Health.*
 Ritz E. Heerman, *Lecturer in Public Health.*
 Arthur C. Hollister, Jr., M.D., M.P.H., *Lecturer in Public Health.*
 Richard A. Koch, M.D., M.P.H., *Lecturer in Public Health.*
 Edwin H. Lennette, M.D., Ph.D., *Lecturer in Virology and Lecturer in Bacteriology for the spring semester.*
 John R. McKinley, M.A., *Lecturer in Public Health.*
 Alfred E. Maffly, B.S., *Lecturer in Hospital Administration.*
 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.*
 Cornelius Martin Mills, M.D., M.S.P.H., *Lecturer in Public Health.*
 William W. Sampson, Ph.D., *Lecturer in Public Health.*
 Henry C. Schumacher, M.D., LL.D., *Lecturer in Public Health.*
 William W. Stadel, A.B., M.D., *Lecturer in Hospital Administration.*
 Tracy I. Storer, Ph.D., *Lecturer in Public Health.*
 Keith O. Taylor, Ph.B., M.B.A., F.A.C.H.A., *Lecturer in Hospital Administration.*

Helen E. Walsh, M.A., *Lecturer in Public Health.*

James Watt, A.B., M.D., Dr.P.H., *Lecturer in Public Health.*

George U. Wood, Ph.C., *Lecturer in Public Health.*

Kent Zimmerman, A.B., 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 7.

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
Prerequisite: consent of instructor.
Field training in health departments and/or military establishments for learning administrative methods and practical procedures in environmental sanitation.

UPPER DIVISION COURSES

- 100A. Introduction to Health Administration. (3) I and II. Mr. Blum
Prerequisite: course 5A-5B or consent of 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
Principles of hospital and medical care organization and administration.
- 103A-103B. Hospital Organization and Management. (3-3) Yr.
Mr. K. O. Taylor, Mr. Stull
Prerequisite: Business Administration 1A-1B. Restricted to students enrolled in the Hospital Administration curriculum or consent of instructor.
Consideration of the fundamentals of organization, business and financial management, personnel management, plant operation, staff organization, and community relationships as applied to hospital administration.
106. Medical Sociology. (3) I. Mr. Rogers
A consideration of the social and economic factors relating to health, disease, and the receipt of medical care.
- †108. Advanced Problems in Public Health Administration. (1-5) I and II.
Mr. Rogers

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

109. Advanced Problems in Medical Administration. (1-5) I and II.
Prerequisite: consent of instructor. Mr. K. O. Taylor, Mr. Rogers
110. Sanitation. (3) I and II. Mr. Kaufman
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. (2) I. Mr. Gotaas, Mr. Mangold
A condensed presentation of the principles and practices of environmental sanitation for advanced public health students.
112. Control of Rodents Affecting the Public Health. (2) I and II.
Prerequisite: consent of 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, ———
Lectures, two hours; laboratory or field trip, three hours.
Prerequisite: course 110 and consent of 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, ———
Lectures, two hours; laboratory or field trip, three hours.
Prerequisite: course 110 and consent of 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; group conferences, and field observations.
A consideration of factors pertaining to the health of children from conception to the end of puberty; community health facilities.
- *131. Health Education Laboratory. (2) I and II. Mr. Griffiths
Prerequisite: consent of 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) II. ———
Prerequisite: open only to undergraduate students in public health with consent of instructor.
Consideration of dynamics of interpersonal relationships as they affect group membership, leadership ability, and community work in the public health field.

* Not to be given, 1953-1954.

134. Community Health Education. (3) I and 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-Age 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 2.
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; laboratory, three hours. 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 and 162 or 261, or consent of instructor.
Methods of investigating epidemics, collection, analysis, and reporting of data.
- †149. Advanced Problems in Epidemiology. (1-5) I and II. Mr. Reeves, Mr. Smith, Mr. Hackett
Prerequisite: course 147B or consent of instructor.
- 150A. Clinical and Public Health Laboratory Procedures. (8) I. The Staff (Miss Hollinger in charge)
Prerequisite: Biochemistry 102, Bacteriology 101, and consent of instructor. Enrollment limited to forty students.
Basic principles and laboratory methods in clinical chemistry, hematology, and mycology, as required in clinical and public health practices.
- 150B. Clinical and Public Health Laboratory Procedures. (8) II. The Staff (Miss Beattie in charge)
Prerequisite: Bacteriology 101, and consent of instructor.
Enrollment limited to forty students.
Laboratory identification of the etiological agents of communicable diseases and bacteriological and chemical examination of water, milk, and utensils.
153. Applied Biology of Sanitation. (4) I. Mr. Crosby
Lectures, two hours; laboratory and field studies, six hours.
Prerequisite: Bacteriology 2. Primarily for students in the public health sanitation curriculum, but open to others with consent of instructor.
Principles of the life sciences relevant to control of environmental sanitation, and techniques of their application.

* Not to be given, 1953-1954.

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

- †154. **Advanced Problems in Public Health Laboratory.** (1-5) I and II.
Prerequisite: consent of instructor. Miss Beattie, Miss Hollinger
Special investigations of public health and clinical laboratory problems.
- *155. **Optical and Electrical Techniques.** (2) II. Miss Hollinger
Lecture, one hour; laboratory, to be arranged.
Prerequisite: consent of instructor. Enrollment limited.
The applications of optical and electrical methods to analysis in biological laboratories.
- 160A. **Biometry.** (3) I and II. The Staff (Mr. Yerushalmy in charge)
Lectures, two hours; laboratory, three hours.
Prerequisite: open only to students who have completed at least 8 units of laboratory courses in the biological sciences.
Students who have completed courses in statistics may enroll only with the consent of the instructor.
Elements of statistical analysis; introduction to the methods of statistical analysis and their applications in the fields of the biological sciences.
- 160B. **Biometry.** (3) II. The Staff (Mr. Yerushalmy in charge)
Lectures, two hours; laboratory, three hours.
Prerequisite: course 160A, or consent of instructor.
Bivariate distributions, elementary methods of sampling, introduction to analysis of variance, special methods applicable to biological data.
- 161A. **Applied Biostatistics.** (3) I. Mrs. French
Lectures, two hours; laboratory, four hours.
Prerequisite: course 5A-5B or consent of instructor.
Elements of vital statistics and demography. Includes consideration of problems of registration, enumeration, morbidity and mortality statistics.
- 161B. **Applied Biostatistics.** (4) II. Mr. Yerushalmy, Mrs. French
Lectures, two hours; laboratory, six hours.
Prerequisite: course 161A.
Extension of methods introduced in 161A to more advanced problems.
Methods of establishing record systems for health activities including case registers for chronic diseases; evaluation and analysis.
162. **Public Health Statistics.** (3) I and II. Mr. Yerushalmy, Mrs. French
Lectures, two hours; laboratory, three hours.
An applied course in public health statistics designed primarily for students in the School of Public Health not majoring in biostatistics. Fall semester enrollment limited to graduate students; spring semester to undergraduate students.
- †163. **Demography.** (2) II. The Staff (Mr. Yerushalmy in charge)
Lecture, one hour; laboratory, three hours.
Prerequisite: course 160A or 161A or consent of instructor.
Introduction to demography and population problems.
- †164. **Advanced Biometry.** (2) I. The Staff (Mr. Yerushalmy in charge)
Lecture, one hour; laboratory, three hours.
Prerequisite: course 160B.
Extension of methods introduced in 160B including methods of small samples, analysis of variance.

* Not to be given, 1953-1954.

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

- †169. Advanced Biostatistics. (1-5) I and 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, Mr. Beard
A survey of the field of industrial health and hygiene. Discussion of occupational hazards and their control; industrial safety; industrial health problems; and organizations concerned with industrial hygiene and health.
171. Industrial Environment Control: Sanitary Air Analysis. (2) II.
Mr. Tebbens
Prerequisite: Chemistry 5 or Civil Engineering 123 or equivalent; Physics 2A-2B or equivalent.
Physical, chemical, and sanitary analysis of the condition of the air and other environmental factors affecting the health and welfare of workers in industry. Application of principles of sanitation in industry.
172. Industrial Toxicology. (2) II. Mr. Hine
Prerequisite: Chemistry 5 and 9, Physics 2A-2B, Physiology 1-1L; or equivalent courses.
Chemical and clinical laboratory techniques applied to investigation of toxic manifestations of industrial hazards.
186. Social, Medical, and Public Health Aspects of Venereal Disease Control.
(2) I and II. Mr. Koch
Discussion and field observation, two hours.
Prerequisite: consent of instructor.
Study of the social causes of the venereal diseases and remedial procedures; administrative control methods, etiology, epidemiology, and treatment; importance of family life education and health education pertaining to their control.
187. Medical Background for Public Health. (2) I.
Observation, six hours. Miss Lindsay, Mr. Frost, ——
Prerequisite: consent of instructor.
Preventive and remedial medical practice illustrated by ward and clinic visits, conferences, and demonstrations. The nature of disease and the basis of therapy are presented to acquaint the nonmedical health worker with the major causes of morbidity.
189. Nutrition Problems in Public Health. (1) II. Miss 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 10)

- 200A-200B. Principles of Public Health Organization and Administration.
(3-2) Yr. Mr. Rogers
A systematic study of the principles of organization and administration and of their application to public health practice.
- 203A-203B. Seminar in Hospital Administration. (2-2) Yr.
Mr. K. O. Taylor, Mr. Stull

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

- 206A-206B. Seminar in Medical Care Administration. (2-2) Yr. Mr. Rogers
 Limited to graduate students specializing in hospital or medical care administration, or by consent of instructor.
 Detailed consideration of organization, operation, and appraisal of medical care programs.
- 209A-209B. Seminar in Public Health Administration. (1-1) Yr.
 Mr. Rogers
213. Advanced Study in Sanitation. (1-5) I. Mr. Mangold, Mr. Kaufman
- 214A-214B. Seminar in Sanitation. (2-2) Yr. Mr. Mangold
224. Seminar in Public Health Nursing Administration. (1) I and II.
 Mrs. Fry
227. Seminar in School Health Administration. (2) II.
 Miss Bierman, Miss Lindsay
 Consideration of the principles basic to organization, administration, and supervision of school health programs in elementary and secondary schools. Health services, environmental factors, communicable disease control, and hygiene of the school day. Students will undertake field studies.
228. Group Study in Maternal and Child Health. (4) II. Miss Bierman
 Prerequisite: open to physicians with consent of 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 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.
 Prerequisite: consent of 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. 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.
- 234A-234B. Seminar in Community Health Education. (1-2) Yr. _____
 Prerequisite: course 200A-200B completed or taken concurrently.
 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, Mr. Hackett
 Lectures and demonstrations, six hours.
 Prerequisite: an M.D. degree or consent of the instructor for those with adequate background in medical bacteriology, immunology, and medical entomology. To be taken concurrently with course 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. Hackett, Mr. Reeves, Mr. Smith
Prerequisite: courses 245 and 147B; and 162 or 160A and 161A.
- †249A-249B. Seminar in Epidemiology. (1-1) Yr. Mr. Hackett
- †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.
- †268. Special Studies in Biostatistics. (1-5) I and II.
The Staff (Mr. Yerushalmy in charge)
Research projects undertaken by students under the direction of the staff.
- †269A-269B. Seminar in Biostatistics. (1-1) Yr.
The Staff (Mr. Yerushalmy in charge)
- †274A-274B. Seminar in Industrial Health. (1-2) Yr.
Mr. Beard, Mr. Tebbens
- *284A-284B. Seminar in Public Health Dentistry. (1-1) Yr. ———
287. Clinical Problems in Public Health. (1-4) I and II. Mr. Smith
Deals with selected clinical subjects of major importance to public health and presents clinical observations and discussions of the most recent advances in diagnosis, treatment, and prevention.
288. Fundamentals of Public Health for Disaster Control. (3) I. Mr. Smith
Prerequisite: consent of 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. ———
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)

* Not to be given, 1953-1954.

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

ROMANCE PHILOLOGY

Francis J. Carmody, Ph.D., *Professor of French.*

Ronald N. Walpole, Ph.D., *Professor of French.*

Yakov Malkiel, Ph.D., *Professor of Romance Philology.*

Departmental Major Adviser: Mr. Malkiel.

- *200. Linguistic History of the Roman Empire. (2) I. Mr. Malkiel
 The external history of the spread of Latin over the Western Mediterranean area, its gradual diversification, and change into the Romance dialects, with emphasis on substrata and superstrata.
201. Late Latin Language and Literature. (2) I. Mr. Malkiel
 The internal history of colloquial Latin and Late Latin, down to the Carolingian period, on the basis of original sources.
202. General Romance Linguistics. (2) II. Mr. Malkiel
 Prerequisite: graduate standing and undergraduate major in languages.
 Problems of methodology in historical linguistic reconstruction, applied to the major and minor Romance languages.
- *203A-203B. Old Provençal. (2-2) Yr. Mr. Walpole
 An introductory study of Old Provençal language and literature, with emphasis on the form and content of the different literary genres and on questions of cultural origins and influences.
- *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).

Old Spanish (Spanish 212A-212B).

* Not to be given, 1953-1954.

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

SCANDINAVIAN

(Department Office, 1218 Dwinelle Hall)

Assar Götrik Janzén, Ph.D., *Professor of Scandinavian (Chairman of the Department)*.Håkon Hamre, *Assistant Professor of Scandinavian*.†Margrethe Schioler, M.A., *Lecturer in Scandinavian*.

Letters and Science List.—All undergraduate courses in Scandinavian are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Janzén.

Preparation for the Major.—At least 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.

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. (4-4) Yr. | Mr. Hamre |
| 3A. Norwegian grammar, composition, reading. | |
| 3B. Advanced composition, conversation, reading. | |
| 4. Elementary Danish. (4) I. | Mr. Hamre |
| Composition, conversation, reading of selected texts. | |
| 14. Intermediate Danish. (3) II. | Mr. Hamre |
| 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. | Mr. Hamre |
| 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. | |

* Not to be given, 1953-1954.

† Absent on leave, 1953-1954.

106. History of Scandinavian Drama up to 1900. (3) I. Mr. Hamre
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
109. Scandinavian Drama of the Twentieth Century. (3) II. Mr. Hamre
- *113. Romanticism in Norway. (3) I. Mr. Hamre
Study of the major works, in poetry and prose, of the Norwegian Romantic movement.
- *114. The Works of Holberg and Oehlenschläger. (3) II. Mr. Hamre
- *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.
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.
The Staff (Mr. Janzén in charge)

GRADUATE COURSE

298. Special Study for Graduate Students. (1-4) I and II.
Mr. Janzén, Mr. Hamre
Prerequisite: graduate standing in Scandinavian Languages.

SLAVIC LANGUAGES AND LITERATURES

(Department Office, 4118 Dwinelle Hall)

- †Waclaw Lednicki, Ph.D., *Professor of Slavic Languages and Literatures (Chairman of the Department)*.
Gleb Struve, B.A. (Oxon.), *Professor of Slavic Languages and Literatures*.
Oleg A. Maslenikov, Ph.D., *Associate Professor of Slavic Languages and Literatures*.
Francis J. Whitfield, Ph.D., *Associate Professor of Slavic Languages and Literatures*.
Lawrence L. Thomas, M.A., *Acting Instructor in Slavic Languages*.
Michael K. Pawlikowski, LL.M., *Associate in Slavic Languages and Literatures*.
Lydia I. Pennell, M.A., *Associate in Russian*.



- George C. Guins, LL.M., *Lecturer in Slavic Languages and Political Science*.
Ante Kadić, Ph.D., *Lecturer*.
Ludmilla A. Patriek, M.A., *Lecturer in Russian*.
Božena Pospishil, Ph.D., *Lecturer in Czech*.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

* Not to be given, 1953-1954.

† Sabbatical leave in residence, fall semester, 1953-1954.

Departmental Major Adviser: Mr. Whitfield.

The Major.—Required: 24 upper division units, including courses 130 or 133A, and 140 and at least 12 units in language courses in the Department; not more than 6 units may be chosen from other departments. Courses in other departments that will be accepted as part of the major are upper division courses in the Greek, Latin, or Gothic languages, in phonetics or comparative linguistics, and any upper division courses in European literature, or in history, that may be specifically approved by the department as combining properly with the work in Slavic languages and literatures. Such courses are, for example, those given by the English Department on the novel and on nineteenth-century poetry, and by the History Department on modern European history, particularly the history of eastern Europe.

Honor Students in the Upper Division.—Candidates for honors must take at least 24 units of upper division work in the department, of which at least 12 units must be of grade A and the remaining 12 units must average not below grade B. The 24 units must include at least 18 units of work in upper division language courses in the department.

LOWER DIVISION COURSES

1. Elementary Russian. Beginners' Course. (4) I and II.
Mr. Thomas in charge
Two lectures and three recitation hours per week. The conversation course of corresponding level is 18A.
2. Elementary Russian (continuation of 1). (4) I and II.
Prerequisite: course 1. Mrs. Patrick in charge
Two lectures and three recitation hours per week. The conversation course of corresponding level is 18B.
3. Intermediate Russian. (3) I and II.
Mr. Maslenikov, Mrs. Patrick, Mr. Pawlikowski
(Formerly course 102A.)
Prerequisite: course 2.
Reading, composition, translation. The conversation course of corresponding level is 19.
- *5A-5B. Elementary Ukrainian. (3-3) Yr. Mr. Thomas
- 6A-6B. Elementary Polish. (3-3) Yr. Mr. Thomas
- 10A-10B. Elementary Serbo-Croatian. (3-3) Yr. Mr. Kadić
- 12A-12B. Elementary Bulgarian. (3-3) Yr. Mr. Whitfield
- 14A-14B. Elementary Czech. (3-3) Yr. Miss Pospishil
- 18A. Elementary Russian Conversation. (2) I and II. Mrs. Pennell
Prerequisite: course 1 (may be taken concurrently).
- 18B. Elementary Russian Conversation. (2) I and II. Mrs. Pennell
Prerequisite: course 2 (may be taken concurrently).
19. Intermediate Russian Conversation. (2) I and II.
(Formerly course 119A.) Mr. Guins, Mrs. Pennell, Mr. Pawlikowski
Prerequisite: course 3 (may be taken concurrently).
30. Great Writers of Russian Literature. (3) I. Mr. Maslenikov
No knowledge of Russian is required.

* Not to be given, 1953-1954; to be given 1954-1955.

UPPER DIVISION COURSES

A. Language Courses

102. Intensive Russian Reading, Grammar, and Composition. (3) II.
 (Formerly course 102B.) Mr. Struve, Mr. Maslenikov
 Prerequisite: course 3.
 The conversation course of corresponding level is 119.
- 103A-103B. Advanced Russian. (3-3) Yr. Mrs. Patrick, Mr. Maslenikov
 Prerequisite: course 102.
 The conversation course of corresponding level is 120.
104. Russian Composition. (3) I. Mr. Struve
 (Formerly course 104A.)
 Prerequisite: course 103B.
105. Written Translation from Slavic Languages. (1-3) I and II.
 The Staff (Mr. Whitfield in charge)
 May be taken only in combination with some other advanced course
 in Slavic languages.
- 107A-107B. Intensive Polish Reading, Grammar, and Composition. (3-3) Yr.
 Prerequisite: course 6B. Mr. Pawlikowski
108. Advanced Studies in Polish Grammar. (3) II. Mr. Thomas
 (Formerly course 108A.)
 Prerequisite: course 107B.
- 111A-111B. Intensive Serbo-Croatian Reading, Grammar, and Composition.
 (3-3) Yr. Mr. Kadić
 Prerequisite: course 10B.
112. Advanced Studies in Serbo-Croatian Grammar. (3) I. Mr. Kadić
 (Formerly course 112A.)
 Prerequisite: course 111B.
- 115A-115B. Intensive Czech Reading, Grammar, and Composition. (3-3) Yr.
 Prerequisite: course 14B. Miss Pospishil
116. Advanced Studies in Czech Grammar. (3) II. Miss Pospishil
 (Formerly course 116A.)
 Prerequisite: course 115B.
119. Advanced Russian Conversation. (2) II. Mr. Pawlikowski
 (Formerly course 119B.)
 Prerequisite: course 102 (may be taken concurrently).
120. Advanced Russian Conversation (continuation of 119). (2) I.
 (Formerly course 120A.) Mr. Guins
 Prerequisite: course 103 (may be taken concurrently).
124. Advanced Russian Composition. (3) II. Mrs. Patrick
 (Formerly course 124A.)
 Prerequisite: course 104.
125. Specialized Russian Reading. (3) I. Mr. Thomas
 Prerequisite: course 3 or consent of instructor.
 Rapid reading of texts in the natural and social sciences.

B. Lecture Courses on Slavic 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) I. Mr. Struve
- *133A. Russian Novelists of the Nineteenth Century (except Tolstoy and
Dostoevsky). (3) I. Mr. Lednicki
- *133C. Dostoevsky. (3) II. Mr. Lednicki
- †133D. Tolstoy. (3) I. Mr. Lednicki
- 133F. Chekhov. (3) II. Mr. Struve
- *134. Russian Folklore. (2) I. Mrs. Patrick
135. The Russian Drama. (2) I. Mrs. Patrick
Survey of Russian drama from the seventeenth century to the
twentieth.
- *140. Survey of Slavic Literatures. (2) I. Mr. Whitfield
- *151. Polish Literature: Sixteenth-Eighteenth Centuries. (2) I.
Mr. Lednicki
Polish writers of the Golden Age (sixteenth century); of the seven-
teenth century; and of the Renaissance of the eighteenth century.
- *153. Polish Literature of the Post-Romantic Period. (2) II. Mr. Lednicki
Novelists of the period of Positivism, and Young Poland.
154. Polish and Russian Romanticism. (2) II. Mr. Lednicki
160. Survey of Czech and Slovak Literature. (2) I. Miss Pospishil
The development of Czech and Slovak literature from the sixteenth
century to the present.
161. Czech and Slovak Literature of the Nineteenth Century. (2) II.
Miss Pospishil
170. Survey of South Slavic Literatures. (2) II. Mr. Kadić
- 180A-180B. Survey of Russian Culture. (2-2) Yr. Mr. 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.

† Not to be given, 1953-1954; to be given 1954-1955.

‡ Not to be given, 1953-1954 or 1954-1955; to be given 1955-1956.

182. History of Polish Culture. (2) II. Mr. Lednicki
Development of the arts, thought, and institutions of Poland.
- *187. Russian Poetry. (2) II. Mr. Struve
Prerequisite: course 103A, or consent of instructor.
Lecture course given in Russian.
- †188. The Slavic-Speaking World. (2) I. Mr. Lednicki
198. Advanced Group Work (1-3) I and II.
The Staff (Mr. Lednicki in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Lednicki in charge)

GRADUATE COURSES

Language Courses

220. Comparative Slavic Linguistics. (2) II. Mr. Whitfield
224. Old Church Slavic. (3) I. Mr. Whitfield
- *225. Medieval Slavic Texts. (2) II. Mr. Maslenikov, Mr. Whitfield
226. Historical Russian Grammar. (2) I. Mr. Maslenikov
- *227. Historical Polish Grammar. (2) I. Mr. Whitfield
- *228. Historical Serbo-Croatian Grammar. (2) II. Mr. Whitfield
229. Historical Czech Grammar. (2) I. Mr. Whitfield
231. History of the Russian Language. (2) II. Mr. Struve
- *232A. Russian Phonetics and Phonemics. (2) I. Mr. Maslenikov
- *232B. Russian Morphology. (2) II. Mr. Maslenikov, Mr. Whitfield
- 232C. Russian Syntax. (2) II. Mr. Whitfield

Literature Courses

237. Early Russian Literature. (2) II. Mr. Maslenikov
- *238. Eighteenth-Century Russian Literature. (2) II. Mr. Struve
240. Seminar in Russian Poetry of the Nineteenth Century. (2) II.
Mr. Lednicki
- †242. Analysis of Russian Literature Texts. (2) I. Mr. Lednicki
- *245. Seminar in the Russian Novel of the Nineteenth Century. (2) II.
Mr. Lednicki
- *246. Seminar in Twentieth-Century Russian Literature. (2) I. Mr. Struve
247. Seminar in the Russian Critics. (2) I. Mr. Struve
- *248. Seminar in the Symbolist Movement. (2) I. Mr. Maslenikov

* Not to be given, 1953-1954; to be given, 1954-1955.

† Not to be given, 1953-1954 or 1954-1955; to be given 1955-1956.

285. Russian Prose. (2) II. Mr. Lednicki
Lecture course given in Russian.
- †288. Seminar in Polish Literature. (2) I. Mr. Lednicki
- *289. Seminar in South Slavic Literature. (2) I. Mr. Kadić
- *290. Seminar in Czech and Slovak Literature. (2) I. Miss Pospishil
298. Individual Work. (1-4) I and II. The Staff (Mr. Lednicki in charge)
Graduate students will be offered opportunities for independent reading and study. Credit will be assigned according to the amount of work done.

SOCIAL WELFARE

(Department Office, 222 Building T-1)

Milton Chernin, Ph.D., *Professor of Social Welfare (Chairman of the Department)*.

†Davis McEntire, Ph.D., *Professor of Social Welfare.*

Gertrude Wilson, M.A., *Professor of Social Welfare.*

Ruth Cooper, D.S.W., *Associate Professor of Social Welfare.*

Walter Friedlander, Ph.D., *Associate Professor of Social Welfare.*

Ernest Greenwood, Ph.D., *Associate Professor of Social Welfare.*

Henry Maas, Ph.D., *Associate Professor of Social Welfare.*

Maurine McKeany, Ph.D., *Associate Professor of Social Welfare and Supervisor of Field Work.*

Gordon Hearn, Ph.D., *Assistant Professor of Social Welfare.*

Barbara E. Judkins, M.S., *Assistant Professor of Social Welfare.*

Elliot Studd, M.A., *Assistant Professor of Social Welfare.*

Kermit T. Wiltse, D.S.W., *Assistant Professor of Social Welfare.*

Martin Wolins, M.S.W., *Instructor in Social Welfare.*



Anna Maenchen, Ph.D., *Lecturer in Social Welfare.*

Ruth H. Morgan, M.S.W., *Lecturer in Social Welfare and Field Work Consultant.*

Eli R. Movitt, M.D., *Lecturer in Social Welfare.*

Lydia Nolan, M.S., *Lecturer in Social Welfare and Field Work Consultant.*

Margaret S. Schubert, M.A., *Lecturer in Social Welfare and Field Work Consultant.*

Lulu Scott, M.S.S., *Lecturer in Social Welfare and Field Work Consultant.*

Hasselaine Byrd Taylor, J.D., Ph.D., *Lecturer in Social Welfare.*

Ernestine Wertheimer, M.S.S., *Lecturer in Social Welfare and Field Work Consultant.*



Kent Zimmerman, M.D., *Lecturer in Pediatrics, Lecturer in Public Health, and Lecturer in Social Welfare.*

* Not to be given, 1953-1954; to be given, 1954-1955.

† Absent on leave, 1953-1954.

‡ Not to be given 1953-1954 or 1954-1955; to be given 1955-1956.

The School of Social Welfare administers a two-year graduate program of education for social work, leading to the degree of Master of Social Welfare. For information regarding admission to and requirements prescribed for the graduate program, see the ANNOUNCEMENT OF THE SCHOOL OF SOCIAL WELFARE.

The department administers the group major in social welfare (in the College of Letters and Science), a preprofessional preparatory program, which is described in the CIRCULAR OF INFORMATION.

Letters and Science List.—Courses 100, 106, and 110A–110B are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

UPPER DIVISION COURSES

100. The Field of Social Welfare. (3) I and II. Mr. Chernin
A survey of the field of social welfare and social work functions. The rise of modern social work and the distinctive techniques of the social work profession. Designed to acquaint undergraduates and nonprofessional students with the field of social welfare. Not open to students who are taking or have completed course 110A–110B.
102. Methods in Social Work. (3) I and II. Mr. Wiltse, Mrs. Wertheimer
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.
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."
- 110A–110B. The Social Services. (3–3) Yr. Mr. Friedlander
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.
199. Special Study for Advanced Undergraduates. (1–3) I and II.
The Staff (Mr. Friedlander in charge)
Prerequisite: senior standing and approval of the major adviser.
Individual readings, research, and conferences with instructor in a field chosen by the student with approval of the instructor.

GRADUATE AND PROFESSIONAL COURSES

These courses are intended primarily for students enrolled in the graduate program of the department, and are limited to such students except by permission of the department.

201. Law and Social Welfare. (1) I and II. Mrs. Taylor
Legal information for social workers; the sources of California laws. The courts of California; fundamentals of law governing domestic relations, neglected and dependent children, delinquents, landlord and tenant, etc.; problems of legal procedure.

* Not to be given, 1953–1954.

- 202A-202B. Social Case Work. (2-2) Yr. Mrs. Nolan, Mrs. Schubert, Miss Scott
Introduction to the study and practice of social case work.
203. Community Organization. (2) I. Miss Wilson
A study of the social resources of the community and of methods of organizing these resources for the meeting of human needs.
- 205A-205B. Growth and Change of the Individual. (2-2) Yr. Mr. Maas (in charge), Mr. Zimmerman, Miss Cooper, Mrs. Maenchen, Mr. Movitt
Basic facts, theories and problems in the physiological, psychological, and social development of the individual, with emphasis on adaptation to stress, as related to social welfare.
205A: From conception through adolescence.
205B: From adulthood through senescence.
Required of all students enrolled in the first graduate year in the School of Social Welfare.
207. Social Welfare Organization. (2) II. Mr. Wiltse, Mrs. Taylor
Major concepts of organization and administrative relationships in the public and private social welfare programs.
208. Social Welfare and Income Maintenance. (2) I. Miss McKeaney, Mr. Friedlander
Critical and evaluative study of social welfare policies, methods, problems and issues in the use of public assistance and social insurance programs to maintain income.
- 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; I.
253. Family and Child Welfare Services. (2) I. Mr. Wiltse
The development, organization, and administration of specific family and child welfare services, including family and marital counseling, and programs for the care and protection of dependent and neglected children.
254. Medical Social Work. (2) II. Miss Cooper
The development, organization, and administration of medical social service functions in institutional and extramural settings.
- *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.

* Not to be given, 1953-1954.

257B. Noninstitutional treatment, probation, and parole; theory and development of probation, parole, and the indeterminate sentence; the organization and administration of parole and probation services.

258A-258B. Advanced Social Case Work. (2-2) Yr.

Miss Cooper, Miss Judkins, Mrs. Studt, Mr. Wiltse

258A. Assignment to sections according to field work placement as follows: corrections; family and child welfare; medical; psychiatric. Emphasis on particular knowledge required in social case work practice in these settings including organization and administrative structure.

258B. Each section includes students from all settings; emphasis on common elements of social case work practice.

259. Principles and Methods of Supervision in Social Welfare. (2) II.

Miss Wilson

Prerequisite: completion of one year of education in a recognized school of social work, including a case-work or group-work and field-work sequence.

Educational and psychological principles involved in supervision; the purposes, possibilities, and current practice of supervision in social agencies; critical evaluation of supervising case material drawn from present practice.

261. Clinical Psychology and Social Work. (1) I.

The relationship of theories and methods in clinical psychology to social work practice.

262. Psychiatry and Social Work. (2) I.

The diagnosis and treatment of the psychoneuroses, neuroses, psychoses, and mental deficiencies, and their social implications. Various schools of psychiatric thought.

265. Social Welfare Research. (2) I and II.

Mr. Greenwood

Prerequisite: Economics 2 or Psychology 5 or equivalent.

Fields and methods of social welfare research; techniques of collecting data; analytical methods.

266. Emotional Development of Children. (2) II.

Mrs. Maenchen, ———

The contribution of psychoanalytic theory to social work with children.

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) I.

Miss Wilson

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. ———
Prerequisite: open to graduate students in any school or department whose interest and research is concerned with such problems, and who have consent of 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.
295. Seminar in Research Problems and Methods. (2) II. Mr. Greenwood
Prerequisite: course 265 or equivalent, and consent of instructor.
Selection and definition of research problems; design of social surveys and experiments; methodological problems.
298. Special Studies. (1-6) I and II.
Mr. Chernin, Mrs. Wertheimer, Mr. Greenwood, Mr. Wolins
Individual or group study, with emphasis on original research, as may be arranged.
299. Special Research. (2) I and II.
Mr. Maas, Mr. Wolins, Miss Cooper, Mr. Greenwood, Mr. Hearn, Mrs. Studt
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.

* Not to be given, 1953-1954.

SOCIOLOGY AND SOCIAL INSTITUTIONS

(Department Office, 206 South Hall)

Herbert G. Blumer, Ph.D., *Professor of Sociology and Social Institutions*
(*Chairman of the Department*).

Wolfram Eberhard, Ph.D., *Professor of Sociology and Social Institutions*.

*Margaret T. Hodgen, Ph.D., *Professor of Sociology and Social Institutions*.
Reinhard Bendix, Ph.D., *Associate Professor of Sociology and Social Institutions*.

*Kenneth E. Bock, Ph.D., *Assistant Professor of Sociology and Social Institutions*.

Duncan MacRae, Jr., Ph.D., *Assistant Professor of Sociology and Social Institutions*.

William Petersen, M.A., *Acting Assistant Professor of Sociology and Social Institutions*.

Philip Selznick, Ph.D., *Assistant Professor of Sociology and Social Institutions*.

Tamotsu Shibutani, Ph.D., *Assistant Professor of Sociology and Social Institutions*.

Cesar Grana, M.A., *Acting Instructor in Sociology and Social Institutions*.

William A. Kornhauser, Ph.D., *Instructor in Sociology and Social Institutions*.

Charles Woodhouse, M.A., *Acting Instructor in Sociology and Social Institutions*.

Letters and Science List.—All undergraduate courses in this department are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Selznick, Mr. Shibutani.

Preparation for the Major.—Required: courses 1, 2. Recommended: Anthropology 2A-2B, Economics 1A-1B, History 4A-4B, Philosophy 20A-20B, Psychology 1A-1B.

The Major.—Required: 24 units in the upper division to be chosen from at least three of Groups A, B, C, D, E, F with a maximum of 9 units in any group chosen. Six units may be chosen outside of the department. All choices must be approved by the departmental major adviser. The completion of the major will require the maintenance of at least a C average.

LOWER DIVISION COURSES

1. Man and Society. (3) I.

Mr. Blumer

Two lectures; one weekly discussion section to be arranged.

An introduction to sociology. Analysis of human group life through principles, concepts and theories: culture, institutions, community, collective behavior, personality, social roles, social disorganization, social planning, etc.

2. Society and Wealth. (3) II.

Mr. Petersen

Two lectures; one weekly discussion section to be arranged.

An introduction to the study of social organization. The social aspects of industrialization are examined in terms of social trends and of selected case studies from several countries. Such topics as population trends, urbanization, social aspects of economic conduct and culture contacts are given special attention.

* Absent on leave, 1953-1954.

SOPHOMORE COURSE

30. Society and Personality. (3) II. Mr. Shibutani
 Two lectures; one weekly discussion section to be arranged.
 Consequences of participation in group life: the social organization of perspectives and personality, and the social control of conduct. Recommended preparation for upper division courses in social psychology; also open to general students.

UPPER DIVISION COURSES

Group A: Social Theory

- 100A-100B. Theory of Social Process. (3-3) Yr. Mr. Petersen
 100A. Traditional perspectives in the study of social and cultural development; the idea of cycles and the idea of progress.
 100B. Objectives and procedures of nineteenth-century studies of social process. Recent approaches and the break with traditional orientations.
 100A not prerequisite to 100B.
- *101A-101B. Theories of Social Change. (3-3) Yr. Miss Hodgen
 101A. Critical analysis of geographical, racial, and economic theories of social progress.
 101B. Comparison of the procedures of investigation employed in studies of social evolution, in natural history, and history.
 101A not prerequisite to 101B.
- *109. Sociology and Social Thought. (3) I. Mr. Selznick
 (Formerly numbered 109A-109B.)
 History of social thought treated as the source of contemporary problems and hypotheses.
122. French Social Thought. (3) II. Mr. Grana
 From Rousseau to Emile Durkheim; the relation of sociology to problems created by the revolution in France; sociology treated as a manifestation of nineteenth-century Conservatism.
125. Contemporary Issues in Social Theory. (3) II. Mr. Grana
 The social status of the intellectual and the problem of knowledge and action in social thought are discussed. The treatment of this problem by major social theorists is analyzed, together with related issues in the sociology of intellectual life.
- Theory of Historical Inquiry (Philosophy 147). (3) I.

Group B: Methods of Research

105. Introduction to Methods of Sociological Study. (3) I. Mr. Blumer
 (Formerly numbered 105A.)
 Examination of methodological problems and technical procedures involved in the selection and definition of problems of investigation; and in the selection, description, classification, and analysis of data. Emphasis on non-quantitative research methods.
106. Introductory Statistics in Sociology. (3) I and II. Mr. MacRae
 (Formerly numbered 16.)
 Two lectures; one three-hour laboratory per week.
 An introduction to basic procedures of statistical analysis of social data; frequency distributions, measures of central tendency and dispersion, simple correlation techniques, measures of reliability and significance.

* Not to be given, 1953-1954.

119. *Methods of Quantitative Investigation.* (3) II. Mr. MacRae
 (Formerly numbered 105B.)
 Research designs in quantitative investigations. Sampling procedures. Data collection: schedules, questionnaires; scaling techniques. Statistical analysis: tests of significance, contingency, non-linear correlation.

Group C: Social Psychology and Collective Behavior

104. *Group Life and the Social Self.* (3) I. Mr. Shibutani
 (Formerly numbered 104B.)
 Recommended: Course 1 or 30.
 Coordination in group behavior with special reference to the genesis and functioning of the self. Introduction to the social psychology of G. H. Mead, with elaboration and evaluation in the light of current research.
- *107. *Social Control.* (3) I. Mr. Blumer
 Critical evaluation of divergent approaches to the analysis of social control.
- *148. *Elementary Collective Behavior.* (3) I. Mr. Shibutani
 (Formerly numbered 148A.)
 Spontaneous, non-institutionalized forms of group behavior; social contagion and crowd behavior, psychic epidemics, popular arts and interests, fashion movements, formation and manipulation of public opinion.
149. *Social Movements and Public Action.* (3) II. Mr. Kornhauser
 (Formerly numbered 148B.)
 Analysis of social movements, the formation and play of public opinion, and the behavior of interest groups.
175. *Communication and Social Contact.* (3) I. Mr. Shibutani
 (Formerly numbered 104A.)
 Recommended: course 1 or 30.
 The establishment of communication channels through differential contact and association; the emergence of consensus in selected primary and secondary groupings. Special emphasis upon the organization and modification of perspectives in mass societies.
178. *Social Interaction and Personal Organization.* (3) II. Mr. Blumer
 A critical analysis of social interaction and personality. Dominant theoretical approaches and schemes of research in social psychology will be considered.

Group D: Comparative Institutions and Historical Processes

- *131A-131B. *Study of Social Processes.* (3-3) Yr. Mr. Bock
 Research course in the comparative and historical study of institutional processes. Individual or group projects in the investigation of processes involved especially in conflict or peaceful contact situations between peoples and groups; other projects accepted with consent of instructor. Emphasis on the sociological use of historical materials. Laboratory and discussion sessions, personal conferences, occasional lectures.

131A not prerequisite to 131B.

* Not to be given, 1953-1954.

- *134. Sociology of War and Conflict. (3) I. Mr. Bock
War as a form of social conflict; violent and peaceful procedures in the pursuit of national objectives; analysis of attempts to specify the common antecedents of war.
- *135. Social Change in Underdeveloped Countries. (3) II. Mr. Eberhard
The problem of progress; the process of change; analysis of factors influencing social change especially in modern Western and Asiatic society.
- 141A-*141B. History of Western Social Organization. (3-3) Yr. Mr. Woodhouse
An analysis of the changing position of the family and community in Western society; effects of war, industrialism, and nationalism upon these groups; background of contemporary problems.
141A not prerequisite to 141B.
142. Comparative Institutions. (3) I. Mr. Eberhard
(Formerly numbered 142A.)
Comparative treatment of selected social institutions with special reference to present industrial, modern societies. Relation of ideas to institutions; institutions and social change.
145. Pre-Industrial Societies. (3) II. Mr. Eberhard
(Formerly numbered 142B.)
Comparative treatment of social institutions of political character and their transformation. Village, city, state and the problem of stratification.
- *151A-151B. The History of Civilization. (3-3) Yr. Miss Hodgen
Nine hours of laboratory per week.
A study of historical changes in the civilization of selected areas.
151A not prerequisite to 151B.
166. Oriental Societies. (3) I. Mr. Eberhard
Main characteristics of Asiatic agricultural societies (China, Japan, India). Differences from western cultures. Research methods. Emphasis on the medieval periods.
167. Nomadic Societies. (3) II. Mr. Eberhard
Main characteristics of Asiatic nomadic societies (Central Asia, Turks, Mongols, Middle East). Their contacts with non-nomadic cultures.
- *168. Culture Contacts and Colonial Policies. (3) I. _____
Study of the impact of western colonial policies and practices upon the indigenous social structure of non-western countries, with special reference to India and Southeast Asia.

Group E: Social Structures and Large-Scale Organizations

102. Social Problems of Large-Scale Organizations. (3) II. Mr. Selznick
The growth of large-scale organizations in business and government; social and psychological factors affecting human relations.
118. Political Sociology. (3) II. Mr. Kornhauser
Introduction to the sociological study of political life. Social and cultural aspects of such topics as political order, voting behavior, nationalism and revolution are discussed.

* Not to be given, 1953-1954.

129. *Sociology of Occupations and Professions.* (3) I. Mr. Kornhauser
An historical and comparative study of selected occupational and professional groups, with emphasis on the social significance of occupational ideologies and the sociological factors related to their development.
132. *Social Stratification.* (3) I. Mr. MacRae
Analysis of recent occupational trends and of social problems of occupational stratification; social classes in local communities and the nation as related to interest organizations.

Group F: Community Life

110. *Inter-Ethnic Contacts.* (3) II. Mr. Shibutani
Prerequisite: course 1, or consent of instructor.
Consequences of the contact of peoples: the symbolic significance of identification marks, multi-ethnic status systems, minority groups and movements, inter-ethnic tensions, race ideology and public policy.
115. *Major Social Problems.* (3) I. Mr. Selznick
The bearing of sociological investigation on the diagnosis and treatment of problems arising from social and cultural disorganization. Race relations, crime, old age, industrial conflict, and political disorder will be among the topics discussed.
130. *Sociology of the Family.* (3) I. Mr. Petersen
Interactions among family, society, and personality in western culture from ancient times to the present.
133. *Population and Migration.* (3) I. Mr. Petersen
(Formerly numbered 133A.)
Population growth, distribution, and movements in Europe and the United States. Demographic processes in relation to institutional changes, migration, ethnic distribution, and public policies.
- *138. *Population Changes in Underdeveloped Areas.* (3) II. ———
(Formerly numbered 133B.)
Population problems of Latin America, Africa, the Near East, and Asia. Population trends in relation to the impact of western civilization upon the indigenous cultures.
155. *The Population of Europe.* (3) II. Mr. Petersen
A factual survey of the main trends in fertility, mortality, and migration in modern Europe, as a base for a broader discussion of population theories as exemplified in the European experience.
157. *Rural Social Organization.* (3) I. Mr. Woodhouse
Study of differences in the social organization of agricultural communities in Latin America, the Orient, South Africa, Canada and the United States, with emphasis on the effects of industrialization in these areas.
160. *The City.* (3) I. Mr. Kornhauser
Social structure of the urban community. Comparative materials from earlier historical periods and from contemporary societies will be used. Emphasis on the effects of urbanization upon various social institutions.
161. *Community and Modern Industry.* (3) I. Mr. Woodhouse
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.

* Not to be given, 1953-1954.

- Rural Sociology (Agricultural Economics 112A-112B). (2-2) Yr.
Mr. Taylor
199. Special Study for Advanced Undergraduates. (1-4) I and II.
The Staff (Mr. Shibusani in charge)

GRADUATE COURSES

- 200A-200B. Practicum in Sociological Field Research. (2-2) Yr.
Mr. Shibusani
Prerequisite: consent of instructor. Recommended preparation: courses 105, 106, 119.
Conceptualization and problem formulation; hypotheses and study designs; techniques of observation, recording and analysis. Participation in joint field studies on selected problems.
- *202. Seminar in Social Problems in Large-Scale Organization. (2) II.
Mr. Bendix
- *203. Seminar in Contemporary Social Theory. (2) II. Mr. Bendix
207. Seminar in Social Action. (2) I. Mr. Blumer
Analysis of the social direction of human conduct; theories and research.
- *210A-210B. Seminar in Comparative Social Processes. (2-2) Yr. Mr. Bock
A study of comparable historical events or event series for the purpose of discovering social or cultural processes.
210A not prerequisite to 210B.
- *211. Analysis of Social Institutions. (2) I. Mr. Selznick
(Formerly numbered 211A-211B.)
A diagnostic approach to the study of institutions; emphasis on leadership and critical decision in large organizations.
218. Advanced General Sociology. (2) I. Mr. Selznick
Analysis of fundamental processes and areas of study in contemporary sociology. Emphasis is placed on a critical examination of basic concepts and premises. A graduate lecture course designed especially for new graduate students.
- *221A-221B. Seminar in Social and Historical Processes. (2-2) Yr.
221A not prerequisite to 221B. Miss Hodgen
235. Seminar in Non-European Cultural Stratification. (2) II.
(Formerly numbered 235A.) Mr. Eberhard
Social processes in Asiatic and North African pre-industrial societies resulting from conquest of agrarian communities by nomads. Problem of feudalism.
- *236. Social Change in Underdeveloped Countries. (2) II. Mr. Eberhard
Study of the process of modernization and industrialization of non-western societies with special reference to colonial and non-colonial areas of Asia.
238. Seminar in Colonization by Non-Western Societies. (2) I.
(Formerly numbered 235B.) Mr. Eberhard
Study of migratory processes in Asia, especially the Far East, in the medieval and modern period. Chinese, Japanese, and Indian expansion and their influence upon social change in the area of penetration.

* Not to be given, 1953-1954.

241. Seminar in Social Organization. (2) II. Mr. Selznick
(Formerly numbered 241A-241B.)
The social conditions affecting the structure and functioning of voluntary associations and administrative organizations; the relation of such organizations to community integration.
- 245A-245B. Quantitative Methods in Political Sociology. (2-2) Yr. Mr. MacRae
Critical survey of literature and analysis of data. Use of election statistics, legislative roll call votes and sample surveys. Relation of social stratification and urbanism to political representation. 245A not prerequisite to 245B.
248. Seminar in Collective Behavior. (2) II. Mr. Blumer
Studies in mass behavior, social movements, and political action.
- 260A-260B. Seminar in Political and Industrial Sociology. (2-2) Yr. Mr. Kornhauser
Contributions of sociology to theory and research in politics and industrial relations. Analysis of structure and ideology of organized groups.
- Seminar in Theories of History (Philosophy 247). (2) II.
299. Individual Study and Research. (1-6) I and II.
The Staff (Mr. Eberhard in charge)

SOILS

(Department Office, 120 Hilgard Hall)

Geoffrey B. Bodman, Ph.D., *Professor of Soil Physics (Chairman of the Department of Soils)*.

Robert L. Crocker, D.Sc., *Professor of Soil Morphology*.

Hans Jenny, D.Sc., *Professor of Soil Chemistry and Morphology*.

Roy Overstreet, Ph.D., *Professor of Soil Chemistry*.

Walter P. Kelley, Ph.D., *Professor of Soil Chemistry, Emeritus*.

² Lannes E. Davis, Ph.D., *Associate Professor of Soils, Davis*.

Paul R. Day, Ph.D., *Associate Professor of Soil Physics*.

A. Douglas McLaren, Ph.D., *Associate Professor of Soil Chemistry*.



Daniel I. Arnon, Ph.D., *Professor of Plant Physiology*.

Isaac Barshad, Ph.D., *Lecturer in Soils*.

Homer D. Chapman, Ph.D., *Professor of Soils and Plant Nutrition, Riverside*.

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

Perry R. Stout, Ph.D., *Professor of Plant Nutrition*.

Letters and Science List.—Courses 110, 111, 112, 113, 114 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Adviser: Mr. Day.

Preparation for the major.—See page 86 of the CIRCULAR OF INFORMATION.

LOWER DIVISION COURSE

10. The Soil and Its Significance to Man. (4) II. Mr. Jenny
Prerequisite: Chemistry 1A, or high school chemistry, and consent of instructor.

² In residence spring semester only, 1953-1954.

Designed for students who desire a general knowledge of soils, soil resources, soil conservation, and the relationship of soil to man and society. Cannot be used for credit in the Soil Science major.

UPPER DIVISION COURSES

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, chemical, and biological 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: course 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: course 100; calculus (Mathematics 3A-3B, or 16A-16B).
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
Laboratory.
Prerequisite: course 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: courses 100 and 101 or 103, and consent of instructor.
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 and Soil Biochemistry. (3) II. Mr. McLaren
Lectures and laboratory.
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.
Lectures. Mr. Stout, Mr. Overstreet
Prerequisite: course 110 and Chemistry 5.
The chemical properties of soil as related to plant growth, and their
measurement.
113. Soil Chemistry in Relation to Plant Growth. (2) II.
Laboratory. Mr. Overstreet, Mr. Stout
Prerequisite: Chemistry 5, Soil Science 112 (to be taken concurrently).
Soil conditions as phenomena and in relation to factors influencing
fertility; liquid and solid phases of the soil, including absorption phenom-
ena, cation exchange and buffer effects.
114. Properties of Colloidal Particles and Systems. (3) II. Mr. Jenny
Lectures with demonstrations.
Prerequisite: a course in physical chemistry.
Properties of colloidal systems of importance in agriculture and biol-
ogy. Chemistry and physics of surfaces (adsorption, ion interchange), elec-
tric double layer, flocculation, Brownian movement, colloid optics, viscosity,
swelling.
116. Soil Management. (2) I. Mr. Bodman in charge
Lectures.
Prerequisite: senior standing in soil science.
Evaluation of soil fertility by field experiments; use of fertilizers; cul-
tivation practices; aspects of soil erosion control. Lectures, discussions, and
demonstrations by various specialists.
199. Special Study for Advanced Undergraduates. (1-5) I and II.
Mr. Arnon, Mr. Barshad, Mr. Bodman, Mr. Crocker, Mr. Davis, Mr. Day,
Mr. Jenny, Mr. McLaren, Mr. Overstreet, Mr. Storie, Mr. Stout
Open only to students with an average grade of at least B, and subject
to the approval of the undergraduate adviser in soil science.

RELATED COURSES IN OTHER DEPARTMENTS

- The Nutrition of Green Plants. (See Plant Nutrition 115, p. 288.)
The Nutrition of Green Plants. Laboratory. (See Plant Nutrition 117, p. 288.)
Plant Biochemistry. (See Plant Biochemistry 123, p. 44.)

GRADUATE COURSES

- 201A-201B. Research in Soil Science. (1-9; 1-9) Yr.
Mr. Arnon, Mr. Barshad, Mr. Bodman, Mr. Crocker, Mr. Davis,
Mr. Day, Mr. Jenny, Mr. McLaren, Mr. Overstreet, Mr. Stout

- *212. Advanced Soil Chemistry. (3) I. Mr. Overstreet
Prerequisite: course 110; course 114; Chemistry 110A-110B, or Chemistry 109 and consent of instructor. Open to graduates and qualified seniors.
Applications of thermodynamics to soil systems. Theoretical treatment of ion exchange and membrane phenomena.
235. Seminar. (1) I. Mr. Jenny
Prerequisite: graduate standing in soil science, plant physiology, or related subjects.
- 236A-236B. Staff Seminar in Soil Science. (No credit) Yr. The Staff
- (GIVEN AT RIVERSIDE)
- 202A-202B. Research in Soils. (1-6; 1-6) Yr. Mr. Chapman
- 237A-237B. Seminar in Soils. (1-1) Yr.
The Staff (Mr. Chapman in charge)

SPANISH AND PORTUGUESE

(Department Office, 4314 Dwinelle Hall)

- Erasmus Buceta, Doctor en Derecho, *Professor of Spanish.*
- ² Charles E. Kany, Ph.D., *Professor of Spanish.*
- Yakov Malkiel, Ph.D., *Professor of Romance Philology.*
- José F. Montesinos, Licenciado en Filosofía y Letras, *Professor of Spanish.*
- Lesley B. Simpson, Ph.D., *Professor of Spanish.*
- Robert K. Spaulding, Ph.D., *Professor of Spanish (Chairman of the Department).*
- Arturo Torres-Rioseco, Ph.D., *Professor of Latin-American Literature.*
- S. Griswold Morley, Ph.D., Litt.D., *Professor of Spanish, Emeritus.*
- Edwin S. Morby, Ph.D., *Associate Professor of Spanish.*
- ¹ Fernando A. Alegría, 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 7.

Departmental Major Advisers.—For Plan A, Mr. Morby; 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).

* Not to be given, 1953-1954.

¹ In residence fall semester only, 1953-1954.

² In residence spring semester only, 1953-1954.

† Absent on leave, 1953-1954.

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. Miss Merrill in charge
Sections meet five hours per week.
Prerequisite: course 1 or two years of high school Spanish, or equivalent.
 3. Intermediate Spanish (continuation of 2). (4) I and II. Mrs. Shadi in charge
Sections meet five hours per week.
Prerequisite: course 2 or three years of high school Spanish, or equivalent.
 4. Introduction to Spanish Literature. (4) I and II. Mrs. Shadi, Miss Fredine
Sections meet four hours per week.
Prerequisite: course 3 or four years of high school Spanish, or equivalent.
Reading and translation.
- 25A–25B. Advanced Spanish. (3–3) Yr. Beginning each semester.
Mr. Alegría, Mr. Morby, Mr. Chapman
Required as preparation for the major.
Prerequisite: four years of high school Spanish, or course 3 (with a grade of at least B) or 4, or equivalent.

25. Advanced Spanish. (5) II. Mr. Morby, Mr. Malkiel
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. Simpson
- 39B. Spain: Neo-Classical Period to Present Day. (2) II.
Mr. Simpson
- 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) II. 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. Buceta
- 104A-104B. Spanish-American Literature. (3-3) Yr. Beginning each semester.
Required of majors in Plan B.
Mr. Alegría, Mr. Chapman, Mr. Torres-Rioseco
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. Spaulding, 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. (3-3) Yr. Mr. Simpson
- 112A-112B. A Survey of Spanish Culture. (2-2) Yr.
112A: Mr. Malkiel. Mr. Malkiel, Mr. Montesinos
112B: Mr. Montesinos.
Required of majors in Plan A.
- 113A-113B. A Survey of Latin-American Culture. (2-2) Yr.
Required of majors in Plan B. Mr. Torres-Rioseco
- 114A-114B. The Contemporary Spanish-American Novel. (2-2) Yr.
114A: Mr. Alegría. Mr. Alegría, Mr. Chapman
114B: Mr. Chapman.
Prerequisite: course 104A-104B.
Required of majors in Plan B.

* Not to be given, 1953-1954.

115. A Survey of Spanish Lyric Poetry. (3) II. Mrs. Shadi
- 116A-116B. Advanced Grammar and Composition. (3-3) Yr. Mr. Simpson
Required only of candidates for the Certificate of Completion, teacher-training curriculum.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
Mr. Simpson in charge
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 10)

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. The Spanish American Novel. (2-2) Yr. Mr. Torres-Rioseco
- *206A. Problems in American Spanish. Syntax. (2) II. Mr. Kany
- *206B. Problems in American Spanish. Semantics. (2) II. Mr. Kany
- *208A-208B. The Ballad. (2-2) Yr. _____
- *209A-209B. The Drama of the Golden Age. (2-2) Yr. Mr. Morby
An intensive study of one author.
- 212A-212B. Old Spanish. (2-2) Yr. Mr. Spaulding
Reading and historical grammar. Required for candidates for the master's degree.
- *213A-213B. The Spanish Novel in the Nineteenth Century. (2-2) Yr. Mr. Montesinos
- 214A-214B. Modernism in Hispano-America. (2-2) Yr. Mr. Torres-Rioseco
- *215A-215B. Moralists and Satirists of the Sixteenth and Seventeenth Centuries. (2-2) Yr. Mr. Montesinos
- *216. Spanish Versification. (1) II. Mrs. Shadi
- *217A-217B. Contemporary Poetry of Spain. (2-2) Yr. Mr. Montesinos
- 218A-218B. Seminar in Spanish Diplomatic Paleography of the Sixteenth Century. (2-2) Yr. Mr. Simpson
- 219A-219B. Spanish Literary Criticism from Neo-Classicism to Modern Times. (2-2) Yr. Mr. Montesinos
- *224A-224B. Gaucho Literature. (2-2) Yr. Mr. Torres-Rioseco
Prerequisite: course 104A-104B.
This course deals with that national type of Argentinian literature known as the "gauchesco" genre. The course is centered around the epic poem, *Martin Fierro*, but includes the origins of this movement as well as its modern development.

225. Pronunciation. (2) II. Mr. Kany

* Not to be given, 1953-1954.

299. Special Advanced Study. (1-4) I and II. Mr. Simpson in charge
 Restricted to candidates for higher degrees, by previous arrangement
 with members of the departmental staff.

PORTUGUESE**LOWER DIVISION COURSES**

1. Elementary Portuguese. (4) I. Mr. Woodbridge
 Sections meet five hours per week.
2. Elementary Portuguese. (4) II. Mr. Woodbridge
 Sections meet five hours per week.
 Prerequisite: course 1 or oral command of the language.
- 21A-21B. Introduction to Portuguese Literature. (3-3) Yr. Mr. Woodbridge
 Prerequisite: course 2, or consent of instructor. Also open to advanced
 students in Romance Languages who have no previous preparation in
 Portuguese.
 Reading and translation.
- *25A-25B. Advanced Portuguese. (3-3) Yr. Mr. Woodbridge
 Prerequisite: courses 1 and 2 or equivalent, or consent of instructor.

UPPER DIVISION COURSES

- Portuguese 122 and 123 are open to upper division and graduate students in
 Romance languages with no previous knowledge of Portuguese.
122. Portuguese Literature. (3) I. Mr. Woodbridge
 Survey of the literature of Portugal.
123. Brazilian Literature. (3) II. Mr. Woodbridge
 Survey of the literature of Brazil.
199. Special Study for Advanced Undergraduates. (1-3) I and II.
 Restricted to senior honor students. Mr. Malkiel, Mr. Woodbridge

GRADUATE COURSES

- *201. The Brazilian Novel. (2) II. Mr. Woodbridge
299. Special Advanced Study. (1-4) I and II. Mr. Malkiel, Mr. Woodbridge
 Restricted to candidates for higher degrees.

SPEECH

(Department Office, 3125 Dwinelle Hall)

- C. Douglas Chrétien, Ph.D., *Professor of Speech and Linguistics.*
 Gerald E. Marsh, M.A., *Professor of Speech (Chairman of the Department).*
¹ Jacobus ten Broek, J.S.D., *Professor of Speech.*
 Dwight E. Watkins, M.A., *Associate Professor of Speech, Emeritus.*
 Edward N. Barnhart, Ph.D., *Associate Professor of Speech and Lecturer in
 Psychology.*
 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.*
 Garff B. Wilson, Ph.D., *Associate Professor of Speech.*
 Woodrow W. Borah, Ph.D., *Assistant Professor of Speech.*

* Not to be given, 1953-1954.

¹ In residence fall semester only, 1953-1954.

William Fearnside, LL.B., Ph.D., *Assistant Professor of Speech.*
 Don Geiger, Ph.D., *Assistant Professor of Speech.*
 Richard Hagopian, M.F.A., *Assistant Professor of Speech.*
 William B. Holther, Ph.D., *Assistant Professor of Speech.*
 Isabel Hungerland, Ph.D., *Assistant Professor of Speech.*
 William Shepard, Ph.D., *Assistant Professor of Speech.*
 Richard B. Wilson, Ph.D., *Assistant Professor of Speech.*
 Roger L. Fulton, Ph.D., *Instructor in Speech.*
 Michael Karnis, Ph.D., *Instructor in Speech.*
 Anthony Ostroff, M.A., *Instructor in Speech.*
 Elizabeth Russell, Ph.D., *Associate in Speech.*
 Fred Stripp, M.A., Th.D., *Associate in Speech.*
 Ward E. Tabler, A.B., *Associate in Speech.*



Robert L. Belooof, M.A., *Lecturer in Speech.*
 Rebecca Hayden, M.A., *Lecturer in Speech.*
 Floyd Matson, M.A., *Lecturer in Speech.*
 Warren Mullins, M.A., *Lecturer in Speech.*
 Dorothy Pilgrim, M.A., *Lecturer in Speech.*
 Kenneth Scholes, M.A., *Lecturer in Speech.*
 Angela Sullivan, M.A., *Lecturer in Speech.*
 Kathleen Sullivan, M.A., *Lecturer in Speech.*

Students must have passed Subject A before taking any course in speech.

The courses in speech fall into two well-defined groups:

(a) *Oral Expression.* In this group come such courses as those in voice culture and oral interpretation of literature.

(b) *Logical Discourse—Expository and Argumentative.* Under this heading are grouped the courses covering the logical and rhetorical bases of those forms of discourse that are primarily addressed to the intellect. The field covered includes study of methods of investigation, analysis, briefing, the testing of evidence, and practice in oral presentation.

Generally speaking, students may choose courses in either group, or in both, but those students who elect speech for their major study are required to 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 7.

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.

The Major.—Required: 24 units in upper division courses which must include 107A-107B, 110A-110B, and 111A-111B. Course 107A-107B should be taken in the junior year. The following courses are also recommended: English: 114A-114B, 116, 117E, and 110; Philosophy: 104, 108, 112, 125, 128, 136A-136B, and 146.

Honors.—Candidates for honors at graduation must have completed the major with an average grade not lower than B.

LOWER DIVISION COURSES

- 1A-1B. Elements of Speech. (3-3) Yr. Beginning each semester.
Mr. Barnhart, Mr. Borah, Mr. Chrétien, Mr. Fearnside, Mr. Fulton,
Mr. Holther, Mr. Marsh, Mr. Matson, Mr. Mullins, Mr. Perstein,
Mr. Rowell, Mr. Rynin, Mr. Shepard, Mr. Stripp, Mr. Tabler,
Mr. ten Broek, Mr. R. B. Wilson
A forum of organized student discussion and speeches based on an intensive study of selected essays chosen from the writings of representative English and American authors; training in the principles of oral rhetoric, in summarizing and outlining, in the use of the library, and in the presentation from the platform of prepared speeches.
In each semester Mr. ten Broek's sections of 1A and 1B are primarily for prelegal students.
- 2A-2B. The Fundamentals of Oral Interpretation of Literature. (3-3) Yr. Beginning each semester.
Mr. Belooof, Mr. Geiger, Mr. Hagopian, Miss Hayden, Mrs. Hungerland, Mr. Ostroff, Mr. Scholes, Mrs. A. Sullivan, Miss K. Sullivan, Mr. G. B. Wilson
Introduction to the oral reading of prose and poetry; practice in speaking and reading with training in the principles for effective delivery.
10. Logic of Argument. (3) I and II. Mr. Rynin
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) II. Mr. Barnhart
Primarily concerned with the function of communication in inducing belief and directing behavior; an introductory study of techniques used in political propaganda and other forms of persuasion.
24. Oral English for Foreign Students. (Intensive course). (8) I and II.
Miss Hayden, Mrs. Pilgrim
Pronunciation, speaking, grammar, reading, and writing of English. Required for those who pass the Examination in English with a mark of 3.
26. Oral English for Foreign Students (continuation of 24). (4) I and II.
Mr. Karnis, Mrs. Pilgrim
Required of those who pass the English Examination for Foreign Students with a mark of 2.
40. Advanced Oral English for Foreign Students. (3) I and II.
Mrs. Russell, Mr. Tabler
Prerequisite: course 26 or consent of instructor.
Practice in précis writing of advanced material, designed to improve the student's ability to grasp and restate meaning of material and to plan and present formal speeches.

UPPER DIVISION COURSES

103. General Phonetics. (3) II. Mr. Chrétien
Physical, anatomical, and physiological background of speech. Classical articulatory phonetic theory. Modern acoustic phonetics.
106. The Oral Reading of Poetry and Prose. (3) I and II. Mr. Ostroff
Prerequisite: primarily for candidates for teaching credentials whose major is English; others admitted with consent of instructor. Not open to students who have taken course 2A or 2B.
The study of poetry and prose from the point of view of oral interpretation. The principles of effective oral reading of literature; much practice in platform reading.

107A-107B. Argumentative Discourse: Oral and Written. (3-3) Yr. Beginning each semester.

Mr. Borah, Mr. Fearnside, Mr. Fulton. Mr. Holther, Mr. Rowell,
Mr. Shepard

Prerequisite: course 1A-1B.

Students completing this course may not receive more than 2 units of credit for course 152.

110A-110B. Oral Argumentation and Debate. (3-3) Yr.

Mr. Marsh, Mr. Perstein

Prerequisite: courses 1A-1B, 2A-2B, and 107A-107B.

111A-111B. The Reading of Prose and Poetry. (3-3) Yr. Beginning each semester.

Mr. Beloof, Mr. Geiger, Mr. Hagopian, Mrs. Hungerland,
Mr. Ostroff, Mr. Scholes, Mr. G. B. Wilson

Prerequisite: course 2A-2B.

111A: The essay and the short story.

111B: The ballad, the lyric, the ode, etc.

117A-117B. Semantics. (3-3) Yr.

Mr. Rynin

Prerequisite: Speech 10, or Philosophy 12A, or equivalent.

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 instructor. Mrs. Hungerland

The nature of symbols, with special emphasis on their function in poetry.

119. Analysis of Communication Content. (3) I.

Mr. Barnhart

Introduction to research techniques in communication with special emphasis on content analysis and audience response; individual and group research projects will be carried out by students under supervision.

132. Classical Rhetoric. (3) I.

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.

135. British Public Address During the Eighteenth and Nineteenth Centuries. (3) I.

Mr. Shepard

Critical analysis of speeches of Burke, Pitt, Peel, Cobden, Bright, Gladstone, Disraeli, Newman, Huxley, Mill, and others. Attention given to issues with which they were identified and their relationship to the social movements of their time.

137. American Public Address During the Eighteenth and Nineteenth Centuries. (3) I.

Mr. ten Broek

Critical analysis of speeches of Randolph, Williams, Franklin, Washington, Hamilton, Marshall, Calhoun, Webster, Emerson, Lincoln, Douglas, and others.

- *138. Modern Public Address. (3) II. Mr. ten Broek
Critical analysis of speeches of Wilson, Roosevelt, Churchill, and other leaders from 1914 to the present time.
139. Modern Spokesmen. (3) I. Mr. R. B. Wilson
An examination of the writings and speeches of leading spokesmen for major contemporary movements—political, social, and religious—with special reference to problems of ideology and ideological conflict, objectivity and evaluation, and the rationalization of conflict.
152. Debate. (2) I and II. Mr. R. B. Wilson
Designed for those who wish to participate in intercollegiate debate. May be repeated for a maximum of 6 units. Students wishing to take this course and 107A-107B may enroll in the latter only with the consent of the instructor and may not receive more than 8 units of credit in any combination of the two courses.
198. Directed Group Studies for Upper Division Students. (1-5) I and II.
The Staff (Mr. Marsh in charge)
199. Special Study for Advanced Undergraduates. (1-5) I and II.
The Staff (Mr. Marsh in charge)

SUBJECT A: ENGLISH COMPOSITION

(Subject A Office, 210 California Hall)

Committee in charge:

Bertrand Evans, Ph.D., *Associate Professor of English and Education (Chairman of the Committee)*.

Karl Aschenbrenner, Ph.D., *Associate Professor of Philosophy*.

Philip F. Griffin, M.A., *Associate Professor of Journalism*.



Phil S. Grant, M.A., *Supervisor of Instruction in Subject A*.

Subject A. (No credit) I and II.

Mr. Grant and Assistants

Three hours weekly.

Required of all students who do not pass the examination in Subject A. Fee, \$20. To those students who maintain an average grade of A during the first seven weeks of the semester half of the fee will be refunded, and they may discontinue attending the course. For the regulations governing this requirement, see the CIRCULAR OF INFORMATION.

Training in correct writing, including drill in sentence and paragraph construction, diction, punctuation, grammar, and spelling. Weekly compositions and written tests on the text. The principles of English composition are presented, and typical student compositions are analyzed and discussed in sections limited to thirty students.

VEGETABLE CROPS

James E. Knott, Ph.D., Sc.D. (hon.c.), *Professor of Vegetable Crops (Chairman of the Department)*, Davis.

John H. MacGillivray, Ph.D., *Professor of Vegetable Crops*, Davis.

LOWER DIVISION COURSE

*1. Vegetable Production. (3) II.

Mr. MacGillivray

Principles involved in vegetable production; survey of the vegetable industry.

* Not to be given, 1953-1954.

ZOÖLOGY

(Department Office, 4079 Life Sciences Building)

- Richard M. Eakin, Ph.D., *Professor of Zoölogy (Chairman of the Department)*.
- Daniel Mazia, Ph.D., *Professor of Zoölogy*.
- Alden H. Miller, Ph.D., *Professor of Zoölogy and Director of the California Museum of Vertebrate Zoölogy*.
- Paul R. Needham, Ph.D., *Professor of Zoölogy*.
- Curt Stern, Ph.D., *Professor of Zoölogy*.
- Richard Goldschmidt, Ph.D., M.D., Sc.D., *Professor of Zoölogy, Emeritus*.
- Samuel J. Holmes, Ph.D., LL.D., *Professor of Zoölogy, Emeritus*.
- William Balamuth, Ph.D., *Associate Professor of Zoölogy*.
- Seth B. Benson, Ph.D., *Associate Professor of Zoölogy and Curator of Mammals, California Museum of Vertebrate Zoölogy*.
- 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*.
- A. Starker Leopold, Ph.D., *Associate Professor of Zoölogy and Conservationist, California Museum of Vertebrate Zoölogy*.
- Frank A. Pitelka, Ph.D., *Associate Professor of Zoölogy and Curator of Birds, California Museum of Vertebrate Zoölogy*.
- *Ralph I. Smith, Ph.D., *Associate Professor of Zoölogy*.
- Robert C. Stebbins, Ph.D., *Associate Professor of Zoölogy and Curator in Herpetology, California Museum of Vertebrate Zoölogy*.
- 2 Max Alfert, Ph.D., *Assistant Professor of Zoölogy*.
- William E. Berg, Ph.D., *Assistant Professor of Zoölogy*.
- Howard A. Bern, Ph.D., *Assistant Professor of Zoölogy*.
- Cadet H. Hand, Ph.D., *Assistant Professor of Zoölogy*.
- Carl B. Koford, Ph.D., *Acting Assistant Professor of Zoölogy*.
- Oliver P. Pearson, Ph.D., *Assistant Professor of Zoölogy (Vice-chairman of the Department) and Assistant Curator of Mammals, California Museum of Vertebrate Zoölogy*.
- James C. Cannan, Jr., M.A., *Associate in Zoölogy for the fall semester*.
- Stuart O. Landry, Jr., B.S., *Associate in Zoölogy for the spring semester*.
- Ronald R. Novales, M.A., *Associate 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, 116, 119A–119B, 120A–120B, and 145 are included in the Letters and Science List of Courses. For regulations governing this list, see page 7.

Departmental Major Advisers: Mr. Bern, Mr. Hand.

Preparation for the Major.—Required: courses 1A, 1B, Botany 1 (for students beginning the major after August, 1953), Chemistry 1A, and either

* Absent on leave, 1953–1954.

2 In residence spring semester only, 1953–1954.

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. Alfert, Mr. Koford, Mr. Cannan
I: Mr. Koford, Mr. Cannan; II: Mr. Alfert, ———.
Lectures and laboratory.
Prerequisite: Chemistry 1A.
An introduction to the principles of biology with special reference to structure, physiology, heredity, and evolution of animals.
- 1B. General Zoölogy. (4) II. Mr. Bern, Mr. Novales
Lectures and laboratory.
Prerequisite: course 1A.
An introduction to vertebrate zoölogy. Structure, function, development, and history of the vertebrate body.
4. Microscopic Technique. (2) I and II. Miss Weesner
Laboratory and reading.
Prerequisite: course 1A and elementary chemistry.
The preparation of animal tissues for microscopic study; methods of fixing, sectioning, and staining.
10. General Biology. (3) I and II. Mr. Hand, Mr. Eakin
I: Mr. Hand; 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, ———
Lectures and laboratory.
Prerequisite: course 1B.
Details of development of the vertebrate body with emphasis in lectures on human embryology, and in laboratory on that of the chick and pig.
101. Introduction to Physicochemical Biology. (2) I. Mr. Mazia
Prerequisite: course 1A and 4 additional units in biological sciences, organic chemistry, general physics.
Survey of the physical and chemical mechanisms underlying the structure and function of the living cell.
- 101C. Physicochemical Biology Laboratory. (2) I. Mr. Mazia
Prerequisite: course 101 (may be taken concurrently).
102. Introduction to Physicochemical Biology. (2) II. Mr. Mazia
Continuation of course 101. The performance of work by the cell. Interactions of cell and environment.

- *102C. Physicochemical Biology Laboratory. (2) II. Mr. Mazia
Prerequisite: courses 101, 101C, and 102 (may be taken concurrently).
103. Chemical Embryology. (2) I. Mr. Berg
Prerequisite: course 100.
A review of the biochemical and physiological studies of developmental processes such as gametogenesis, fertilization, cleavage, and differentiation, with emphasis on results obtained with sea-urchin and amphibian embryos.
- *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.
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. Koford, Mr. Landry
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. Hand
Microorganisms, other than bacteria, in relation to water supplies.
Restricted to students in sanitary engineering.
110. Biology of the Protozoa. (4) I. Mr. Balamuth
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) II. Mr. Balamuth
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, 1953-1954.

112. Invertebrate Zoölogy. (4) II. Mr. Hand
Lectures, laboratory, and field work.
Prerequisite: course 1A.
Anatomy, classification, and natural history of common invertebrate animals.
113. Natural History of the Vertebrates. (4) II. Mr. Miller, Mr. Benson, Mr. Stebbins
Lectures, field trips, and laboratory.
Prerequisite: course 1B.
The birds, mammals, reptiles, and amphibians, chiefly of California; identification of species; observational methods in study of behavior and habitat relations; systematics. Field work emphasized.
114. Genetics. (3) I. Mr. Stern
Prerequisite: course 1A, or Botany 1A, or course 10, and upper division standing. Not open for credit to students who take Genetics 100.
The facts of heredity, basic and advanced.
- 114C. Genetics Laboratory. (2) I. Mr. Stern
Prerequisite: course 114 (may be taken concurrently).
Limited to twenty-four students.
115. Human Genetics. (3) II. Mr. Stern
Prerequisite: course 1A, or Botany 1A, or course 10, and upper division standing.
A study of the principles of inheritance as applied to the physical and mental characteristics of man, of the heredity-environment problem, and of the genetic constitutions of populations.
116. Introduction to Wildlife and Fisheries Management. (4) I. Mr. Leopold, Mr. Needham
Lectures and laboratory.
Prerequisite: course 1A or 10 and upper division standing.
Theory and practice of wildlife and fisheries management; identification, distribution, and life histories of important species.
118. Comparative Endocrinology. (3) I. Mr. Bern
Prerequisite: course 1B and Chemistry 8.
Lectures on the biology of hormonal mechanisms, with reference to the invertebrates and lower vertebrates, as well as mammals.
- 118C. Comparative Endocrinology Laboratory. (2) I. Mr. Bern
Prerequisite: courses 4 and 118 (course 118 may be taken concurrently).
Laboratory exercises and demonstrations illustrating hormonal mechanisms. Enrollment limited to ten students.
- 119A-119B. Optics and Metrology in Biology. (2-2) Yr. Mr. Gullberg
119A. The theoretical principles and the critical use of the microscope, spectroscope, and other primary optical instruments. Open to students with upper division or graduate standing in biological or physical science.
119B. The theory and advanced technique of scientific photography, photomicrography, and special photometric methods. 119A is prerequisite to 119B.
- 120A-120B. Electrical Measurements in Biology. (2-2) Yr. Mr. Gullberg
Lectures and laboratory.
Enrollment limited and requires consent of instructor.
An analytical study of direct and alternating current circuits and instruments used in biological research.

123. Invertebrate Embryology. (2) II. Mr. Berg
Prerequisite: course 100.
Special emphasis will be given to the experimental embryology of marine invertebrates.
- 123C. Invertebrate Embryology Laboratory. (2) II. Mr. Berg
Prerequisite: course 123.
Descriptive and experimental embryology of selected invertebrates.
124. Invertebrate Physiology. (4) I. ———
Lectures and laboratory.
Prerequisite: course 1A. Recommended: course 112 or a course in physiology.
Comparative physiology of the invertebrates, with individual laboratory problems on nutrition, respiration, excretion, coördination, and other functions. Enrollment limited to twelve students.
125. General Ecology. (2) II. Mr. Pitelka
Prerequisite: two semesters of upper division work in biology, or graduate status in a related field.
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; 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.
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) II. Mr. Balamuth
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) I. Mr. Smith
Lectures and laboratory.
The biology of the sponges, coelenterates, echinoderms, and protochordates. Given every other year (alternates with 142B).
- 142B. Advanced Invertebrate Zoölogy. (4) II. _____
The biology of the annelids, arthropods, and molluscs. Given every other year (alternates with 142A).
145. Advanced Wildlife Management. (3) II. Mr. Leopold
Lectures and laboratory.
Prerequisite: course 116.
Manipulation of environments in the control of bird and mammal populations. Characteristics of wild populations. Field and laboratory techniques.
197. Extra Session Work. (1-4) The Staff
Work on assigned topics carried on in the field, or in Berkeley when the University is not in session, under the direction of a member of the staff.
199. Special Study for Advanced Undergraduates. (1-4) I and II. _____
The Staff (Mr. Eakin in charge)
Prerequisite: senior standing with at least a B average in upper division courses in zoölogy; background courses in chosen subjects.

GRADUATE COURSES

For admission to a graduate course a student should have permission of the instructor (which may be given to graduate students and seniors with not less than a B average), and should have 12 units of basic upper division work.

201. Seminar in Physicochemical Biology. (2) II. Mr. Mazia
Prerequisite: courses 101 and 102 or consent of instructor.
Seminar discussion of recent literature on the physicochemical organization of the cell and the physicochemical mechanisms underlying cell functions.
207. Seminar in Cytology. (1 or 2) II. Mr. Alfert
Prerequisite: graduate standing and course 107.
Critical discussion of basic problems and recent literature in descriptive cytology and cytochemistry.
- *208. Seminar in Invertebrate Zoölogy. (2) I. Mr. Smith
Prerequisite: graduate standing and courses in invertebrate zoölogy.
Topics will vary from year to year. May be repeated without duplication of credit.
- *212. Advanced Marine Invertebrate Zoölogy. (4) Mr. Smith
Given at the seashore in Summer Session I.

* Not to be given, 1953-1954.

217. Seminar in Comparative Histopathology. (1) I and II. Mr. DeOme
A presentation of normal and pathological material to illustrate the reaction of normal tissue to various environmental agents. Special emphasis is placed upon the neoplastic changes.
218. Seminar in Comparative Endocrinology. (1) I and II. Mr. Bern
Prerequisite: graduate standing and course 118 or equivalent.
Discussion of current literature and review articles.
219. Seminar in Animal Ecology. (1) I. Mr. Pitelka
Prerequisite: course 125 or consent of instructor.
Review of special topics, with emphasis on current literature.
220. Seminar on Speciation in Vertebrates. (2) I. Mr. Miller, Mr. Benson
Prerequisite: course 113.
Problems of speciation and isolating mechanisms in vertebrates.
222. Seminar in Wildlife Management and Population Dynamics. (2) II. Mr. Leopold
Prerequisite: courses 116 and 145 or consent of instructor.
Review of current research by students; review of literature and special topics.
223. Seminar in Fisheries Management. (2) I. Mr. Needham
Prerequisite: courses 116 and 138.
Analysis of fish population problems including review of recent research, special phases, and work of students.
224. Research. (1-8) I and II. The Staff (Mr. Eakin in charge)
Original study on special topics in laboratory, field, and museum. The work may be carried on in the laboratories at Berkeley, or in the field, or at a marine station at any season of the year. Credit awarded according to work accomplished.
240. Zoölogy Seminar. (No credit) I and II. The Staff (Mr. Needham in charge, fall semester; Mr. Stebbins 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. Balamuth
242. Seminar in Experimental Morphogenesis. (2) I. Mr. Berg
243. Vertebrate Review. (1) II. Mr. Benson, Mr. Pitelka
Review of current literature on ecology and evolution of higher vertebrates.
May be repeated without duplication of credit.
244. Genetics Review. (1) I. Mr. Stern
Prerequisite: graduate standing and one course in genetics.
Review of current literature and of special topics.
May be repeated without duplication of credit.
245. Seminar in Advanced Genetics. (2) II. Mr. Stern
Prerequisite: graduate standing and a course in genetics.
Topics will vary from year to year.

* Not to be given, 1953-1954.

299. Special Study for Graduate Students. (1-4) I and II.

The Staff (Mr. Eakin in charge)

Prerequisite: graduate status in zoölogy and consent of instructor.

Any properly qualified graduate student who wishes to pursue a problem through reading or other advanced study may do so if his proposed project is acceptable to a member of the staff.

MUSEUM OF VERTEBRATE ZOÖLOGY

This Museum, situated in the Life Sciences Building on the Berkeley campus, was founded and endowed by the late Miss Annie M. Alexander as a repository for specimens and information relative to the higher vertebrate animals of the Pacific Coast region of North America. The particular groups of animals with which it is concerned are the mammals, birds, reptiles, and amphibians; of these, it has a large and continually growing collection, as indicated (on March 20, 1953) by a total of 307,392 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.

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