

Bulletin

UNIVERSITY OF CALIFORNIA



**General
Catalogue**

DEPARTMENTS AT
LOS ANGELES

Fall and Spring
Semesters
1957-1958

AUGUST 10, 1957

Price Twenty-five Cents

261. **Seminar in Climatology.** (3) II. Mr. Bailey
Prerequisite: course 113 or the equivalent, and consent of the instructor.
262. **Land Forms and Their Geographic Significance. Seminar.** (3) I. Mr. Glendinning
Prerequisite: course 115 or the equivalent, and consent of the instructor.
270. **Seminar in Economic Geography.** (3) I. Mr. MacFadden
Prerequisite: course 141 or 142, or the equivalent, and consent of the instructor.
271. **Seminar in Political Geography.** (3) II. Mr. Kostanick
Prerequisite: course 181 or the equivalent, and consent of the instructor.
272. **Seminar in Cultural Geography.** (3) II. Mr. Nelson
Prerequisite: consent of the instructor.
The topic for 1958 will be concerned with some aspect of industrial geography.
273. **Seminar in Selected Regions.** (3) I. Mr. Kostanick
Prerequisite: course 127, and consent of instructor.
The region to be considered for 1957 will be Soviet Asia.
275. **Advanced Field Problems in Local Geography.** (6) Mr. Logan
Six weeks, concurrent with the Summer Session.
Prerequisite: course 101 or the equivalent, and consent of the instructor.
Advanced field study in representative areas of southern California; reconnaissance and detailed field-mapping, systematic and regional analysis of significant physical and cultural features, and the preparation of written research and field reports.
280. **Geographic Writing—Research Techniques and Reports.** (3) I. Mr. Gaines
Prerequisite: consent of the instructor.
290. **Research in Geography.** (1-6) I, II. The Staff
Prerequisite: consent of the instructor.
Investigation subsequent to, and growing out of, any of the above seminars.

GEOLOGY

(Department Office, 3611 Geology Building)

Daniel I. Axelrod, Ph.D., *Professor of Geology.*

†Cordell Durrell, Ph.D., *Professor of Geology.*

U. S. Grant, Ph.D., *Professor of Geology.*

†Joseph Murdoch, Ph.D., *Professor of Geology, Emeritus.*

William C. Putnam, Ph.D., *Professor of Geology (Chairman of the Department, to October 1, 1957).*

*George Tunell, Ph.D., *Professor of Geology.*

*Kenneth D. Watson, Ph.D., *Professor of Geology.*

William John Miller, Ph.D., Sc.D., *Professor of Geology, Emeritus.*

Donald Carlisle, Ph.D., *Associate Professor of Geology.*

John C. Crowell, Ph.D., *Associate Professor of Geology.*

Willis P. Popenoe, Ph.D., *Associate Professor of Geology.*

David J. Varnes, B.S., *Associate Professor of Geology.*

Clarence A. Hall, Jr., Ph.D., *Assistant Professor of Geology.*

* Absent on leave, 1957-1958.

† Recalled to active service, 1957-1958.

‡ In residence fall semester only, 1957-1958.

Donald W. Lovejoy, A.M., *Acting Assistant Professor of Geology.*
 Clemens A. Nelson, Ph.D., *Assistant Professor of Geology.*
 John L. Rosenfeld, Ph.D., *Assistant Professor of Geology.*
 Edward L. Winterer, Ph.D., *Assistant Professor of Geology.*
 Alexander Stoyanow, Ph.D., *Research Associate in Geology.*



David T. Griggs, *Professor of Geophysics.*
 George C. Kennedy, Ph.D., *Professor of Geochemistry.*
 Louis B. Slichter, Ph.D., *Professor of Geophysics and Director of the Institute of Geophysics.*
 Leon Knopoff, Ph.D., *Associate Professor of Geophysics.*

GEOLOGY

Letters and Science List.—All undergraduate courses in geology, mineralogy, and paleontology are included in the Letters and Science List of Courses. For regulations governing this list see page 6.

Preparation for the Major.—Geology 3, 5; Mineralogy 6; Chemistry 1A-1B; Physics 2A-2B; Engineering 1A; Mathematics D or 1, C, and 3A; a reading knowledge of any modern foreign language; English 106S.

The Major.—At least 26 units of upper division courses, including Geology 102A-102B, 102C, 103, 107, 116 and 118A-118B or 199 (6 units), and Paleontology 111. Each major program must be approved by the department.

At the end of the senior year each student must take a comprehensive final examination.

Differential and integral calculus, physical chemistry, and analytic mechanics are recommended for students whose chief interest is physical geology.

Advanced zoology courses are recommended for students concerned chiefly with paleontology and stratigraphy.

Students interested in mining geology may take such courses as mineral exploration, mineral economics, mineral exploitation, and mineral dressing at Berkeley.

GEOPHYSICS

For the interdepartmental curriculum in geophysics, see page 12.

GEOLOGY

LOWER DIVISION COURSES

2. **General Geology—Physical.** (3) I, II. Mr. Nelson, Mr. Grant
 Not open to students who have taken or are taking Geology 5.
 An elementary course in the principles of physical geology.
3. **General Geology—Historical.** (4) II. Mr. Nelson
 Lecture, three hours; laboratory, three hours. Prerequisite: course 2 or 5.
 The geologic history of the earth and its inhabitants.
5. **Physical Geology.** (4) I. Mr. Axelrod
 Lecture, three hours; laboratory, three hours. Field trips are taken during laboratory periods. Prerequisite: elementary chemistry. Not open to students who have taken or are taking Geology 2.
 A beginning course in physical geology for science majors and engineers.

UPPER DIVISION COURSES

101. **Principles of Geology.** (3) I. Mr. Carlisle
 Prerequisite: junior standing. Not open to students who have taken Geology 2, 3, or 5.
 A survey of the principles of physical and historical geology.

102A-102B. Field Geology. (3-3) Yr.

The Staff

Lecture, one hour; laboratory, three hours; field work Tuesdays or Saturdays all day. Prerequisite: course 3; Engineering 1A; 103 (may be taken concurrently with 102A); 102C (must be taken concurrently); English 106S (may be taken concurrently); 102A prerequisite to 102B.

Principles and methods of geologic mapping.

102C. Geologic Problems. (1) I.

The Staff

Laboratory, three hours. Prerequisite: course 102A must be taken concurrently.

Application of descriptive geometry and trigonometry to geologic problems; interpretation of geologic maps and air photographs; preparation of geologic illustrations.

103. Petrology. (3) I.

Mr. Durrell

Lecture, two hours; laboratory, four hours. Prerequisite: Mineralogy 6; Chemistry 1B (may be taken concurrently).

Origins and characteristics of rocks. Laboratory determination with the hand lens.

107. Geology of North America. (2) II.

Mr. Nelson

Prerequisite: course 3.

A regional study of North American geology.

110. Economic Geology. (3) II.

Mr. Carlisle

Lecture, two hours; laboratory, three hours. Prerequisite: course 103.

Origin and occurrence of the important metallic and nonmetallic mineral deposits.

111. Petroleum Geology. (3) I.

Mr. Crowell

Prerequisite: courses 102A, 116.

Geology applied to the exploration and production of petroleum, techniques of surface and subsurface geology; petroleum engineering problems of concern to geologists.

116. Structural Geology. (3) II.

Mr. Crowell

Lecture, two hours; laboratory, three hours. Prerequisite: course 102A and 103. A knowledge of descriptive geometry (e.g., Engineering 2) is desirable.

Fraiture, folding, and flow of rocks. Graphic solution of structural problems.

117. Geomorphology. (3) I.

Mr. Putnam

Prerequisite: course 2, or 5, or 101.

Principles of geomorphology.

118A. Advanced Field Geology. (4)

The Staff

Eight weeks, commencing with Summer Session. Prerequisite: Geology 102B or the equivalent; Geology 116. Geology 118B must be taken concurrently.

Preparation of a geologic field map and structure sections of a selected region.

118B. Advanced Geologic Report Writing. (2)

The Staff

Eight weeks commencing with Summer Session. Geology 118A must be taken concurrently.

Preparation of a geologic report concerning the geology of the region mapped in course 118A.

158. **Foundations of Stratigraphy.** (2) I. Mr. Axelrod
Prerequisite: course 102.
A survey of geologic, paleontologic, biologic, and climatic principles applicable to stratigraphy, and their bearing on paleogeography.
199. **Special Studies in Geology.** (1 to 6) I, II. The Staff (Mr. Putnam in charge)
Open only to seniors. Prerequisite: approval of the department chairman.

GRADUATE COURSES

- 214A-214B. **Advanced Petrographic Laboratory.** (2-5; 2-5) Yr. Mr. Rosenfeld
Prerequisite: Mineralogy 109. Recommended: course 251. Offered in alternate years.
Igneous rocks.
- *215A-215B. **Advanced Petrographic Laboratory.** (2-5; 2-5) Yr. Mr. Durrell
Prerequisite: Mineralogy 109. Offered in alternate years.
Metamorphic rocks.
- *236. **Physical Geology of California.** (3) II. Mr. Durrell
- *251. **Seminar in Chemical Petrology.** (3) I. Mr. Turnell
Prerequisite: Mineralogy 109.
252. **Seminar in Geomorphology.** (3) II. Mr. Putnam
Prerequisite: course 117 or the equivalent.
255. **Seminar in Dynamical Geology.** (3) I. Mr. Grant
Prerequisite: consent of the instructor; calculus required.
258. **Seminar in Stratigraphy.** (3) II. Mr. Nelson
Prerequisite: course 158.
259. **Field Investigations in Geology.** (2) II. The Staff
Prerequisite: graduate standing and consent of the instructor.
Preparatory seminars on a selected field problem, followed by a field trip to the region during spring recess, with a report required.
- 260A-260B. **Seminar in Structural Geology.** (3-3) Yr. Mr. Crowell
The second semester of this course may be taken without the first.
- 263A-263B. **Seminar in Economic Geology.** (3-3) Yr. Mr. Carlisle
Seminar, two hours; laboratory, three hours. Occasional field trips during the course. Prerequisite: course 110. Mineralogy 108 and 181 are recommended. The second semester of this course may be taken without the first.
299. **Research in Geology.** (1 to 6) I, II. The Staff (Mr. Putnam in charge)

MINERALOGY

LOWER DIVISION COURSE

6. **Introduction to Mineralogy.** (4) I, II. Mr. Murdoch
Lecture, two hours; laboratory, six hours. Two or more one-day field trips required. Prerequisite: elementary chemistry.
Determination of common rock-forming minerals; origin, relationships, and properties; study of simple crystals; use of blowpipe and chemical tests for minerals.

* Not to be given, 1957-1958.

UPPER DIVISION COURSES

101. **Paragenesis of Minerals.** (2) I. Mr. Murdoch
Prerequisite: course 6 and one year of college chemistry.
- *102. **Advanced Mineralogy.** (3) II. Mr. Tunell
Lecture, one hour; laboratory, six hours. Prerequisite: course 6 or the equivalent.
Crystallography with study of models and national crystals; determination with fuller treatment of nonsilicate minerals.
108. **Optical Mineralogy and Petrography.** (4) I. Mr. Rosenfeld
Lecture, two hours; laboratory, six hours. Prerequisite: course 6; Geology 103 (may be taken concurrently).
Optical properties of minerals; determination of minerals and rocks with the petrographic microscope; immersion methods.
109. **Petrology and Petrography of Igneous and Metamorphic Rocks.** (2) II.
Laboratory, six hours. Prerequisite: course 108 (formerly numbered 109A).
Characteristics and origin of igneous and metamorphic rocks; determination with the petrographic microscope.
110. **Petrology and Petrography of Sedimentary Rocks.** (2) II. Mr. Winterer
Laboratory, six hours. Prerequisite: course 108 (formerly numbered 109A).
Characteristics and origin of sedimentary rocks; physical and mineralogical analysis of sediments; determination of minerals by immersion methods.
181. **Mineralography.** (2) II. Mr. Murdoch
Laboratory, six hours. Prerequisite: course 108 (formerly numbered 109A).
Determination of opaque minerals in polished sections; recognition of common ore minerals; paragenetic relationships.

GRADUATE COURSES

- *274. **Seminar in Structural Crystallography.** (2-5) I. Mr. Tunell
Seminar, two hours; laboratory, optional. Prerequisite: consent of the instructor.
Advanced crystallography and the atomic structure of crystals.
282. **Problems in Goniometry.** (2 to 4) II. Mr. Murdoch
299. **Research in Mineralogy.** (1 to 6) I, II. Mr. Murdoch, Mr. Tunell

PALEONTOLOGY

UPPER DIVISION COURSES

101. **Principles of Paleontology.** (3) II. Mr. Hall
Prerequisite: junior standing.
A survey of the principles governing the evolution and distribution of fossils.
111. **Systematic Invertebrate Paleontology.** (4) II. Mr. Popenc
Lecture, two hours; laboratory, six hours. Prerequisite: Geology 3.
The study of invertebrate fossils.

* Not to be given, 1957-1958.

- 114. Micropaleontology. (3) II.** Mr. Winterer
Lecture, one hour; laboratory, six hours. Prerequisite: course 111 and Geology 102B.
Study of the microfossils important in stratigraphic work.
- 120. Paleobotany. (3) II.** Mr. Axelrod
Lecture, two hours; laboratory, three hours. Prerequisite: Geology 3, Botany 2. Offered in alternate years.
Vegetation of the earth during geologic time.
- 136. Paleontology and Stratigraphy of the Paleozoic and Mesozoic. (3) I.** Mr. Popenoe
Lecture, one hour; laboratory, six hours. Prerequisite: course 111.
- 137. Paleontology and Stratigraphy of the Cenozoic. (3) II.** Mr. Hall
Lecture, two hours; laboratory, three hours. Prerequisite: course 111.

GRADUATE COURSES

- 215. Systematic Conchology and Echinology. (2) I.** Mr. Grant
Prerequisite: course 111.
Classification of west-American Cenozoic Mollusca and Echinoidea.
- 258. Seminar in Paleontology. (2) I.** Mr. Popenoe
Prerequisite: course 111.
Review of current and classic paleontologic works, with emphasis on principles of paleontology.
- 290. Research in Biogeography. (1-4) I, II.** Mr. Axelrod
Prerequisite: graduate standing in biological science; consent of the instructor.
Application of geological and paleontological data to a solution of present-day biogeographical problems.
- 299. Research in Paleontology. (1 to 6) I, II.** Mr. Popenoe, Mr. Grant

GEOPHYSICS

UPPER DIVISION COURSE

- 122. Geophysical Prospecting. (3) II.** Mr. Slichter, Mr. Knopoff
Prerequisite: consent of the instructor.
The principles of geophysical prospecting for ores, petroleum, and other economic minerals.

GRADUATE COURSES

- 249. Experimental Petrology. (3) I.** Mr. Kennedy
- 250. Seminar in Geophysics. (3) I.** Mr. Slichter
Seismology, geophysical prospecting, electromagnetic prospecting. Selected topics in earth physics. The content will vary from year to year.
- 253. Seminar in Geochemistry. (3) I.** Mr. Kennedy
Consideration of phase equilibria with particular attention to the origin of igneous and metamorphic rocks.
- 260. Experimental Geology. (3 to 6) II.** Mr. Griggs
Seminar, two hours; laboratory optional. Prerequisite: consent of the instructor.
The mechanics of rock deformation. Dimensional analysis and model theory applied to geological problems.

290. Research in Geophysics. (1-6) I, II.

The Staff

This course will include studies relative to exploration geophysics and experimental work in the electromagnetic model laboratory; research relative to gravity-surveying and to gravity earthtides (Mr. Slichter); theoretical and experimental studies relative to seismology and geophysics (Mr. Knop-off); tectonophysics and properties of matter at high pressure (Mr. Griggs); atmospheric electrical phenomena (Mr. Holzer); meteorological problems (Mr. Palmer).

GERMANIC LANGUAGES

(Department Office, 310 Royce Hall)

Gustave Otto Arlt, Ph.D., *Professor of German.*Alfred Karl Dolch, Ph.D., *Professor of German.*Wayland D. Hand, Ph.D., *Professor of German and Folklore.*Victor A. Oswald, Jr., Ph.D., *Professor of German (Chairman of the Department).*Erik Wahlgren, Ph.D., *Professor of Scandinavian Languages.*Frank H. Reinsch, Ph.D., *Professor of German, Emeritus.*Carl William Hagge, Ph.D., *Associate Professor of German.**Vern W. Robinson, Ph.D., *Associate Professor of German.*Eli Sobel, Ph.D., *Associate Professor of German.*William J. Mulloy, Ph.D., *Associate Professor of German, Emeritus.*Robert R. Heitner, Ph.D., *Assistant Professor of German.*William F. Roertgen, Ph.D., *Assistant Professor of German.*Terence Harrison Wilbur, Ph.D., *Assistant Professor of German.*Franz H. Bäuml, Ph.D., *Instructor in German.*Charles W. Hoffmann, Ph.D., *Instructor in German.*Lee B. Jennings, Ph.D., *Instructor in German.*Stephanie Lombardi, Ph.D., *Associate in German.*Edith A. Schulz, M.A., *Associate in German.*William Melnitz, Ph.D., *Professor of Theater Arts.*

Letters and Science List.—All undergraduate courses in German and Scandinavian languages except German 370 are included in the Letters and Science List of Courses. For regulations governing this list, see page 6.

Preparation for the Major.—Required: course 1, 2, 3, (3LS, 3PS), 4, 6, and 42A-42B, or their equivalents. Recommended: History 1A-1B; English 1A-1B, 46A-46B; Philosophy 20A-20B.

The Major in German.—At least 24 units in upper division courses, including 106A, 106B, 107, 109A, 118A, 118B, and one course from each of the following groups: (1) 105, 108, 109B, 119; (2) 104A, 104B, 110, 111; (3) 114A, 114B. Students looking forward to the secondary credential should take also 106C-106D. Students desiring a purely literary or philological major, not looking toward secondary teaching, should consult the departmental adviser regarding permissible substitutions of courses.

Requirements for Admission to Graduate Courses

A candidate for admission to graduate courses in Germanic languages and literatures must meet, in addition to the general University requirements, the minimum requirements for an undergraduate major in this department. If the candidate is deficient in this prerequisite he must fulfill it by undergraduate courses taken as a graduate student.

* Absent on leave, 1957-1958