

GEOLOGY (GEOL)

undefined

GEOL Courses

GEOL 102. Introduction to Geology. 4 units

Term Typically Offered: W

2020-21 or later catalog: GE Area B1

2019-20 or earlier catalog: GE Area B3

Processes responsible for the Earth's minerals, rocks, structure, and surface features. Volcanism; mountain building; plate tectonics; weathering. Erosion and deposition by streams, glaciers, wind and waves. Geological resources, earth hazards, and interaction of humanity with global processes. 3 lectures, 1 discussion. Fulfills GE Area B1 (GE Area B3 for students on the 2019-20 or earlier catalogs).

GEOL 200. Special Problems for Undergraduates. 1-2 units

Term Typically Offered: F, W, SP

Prerequisite: Consent of department chair.

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter.

GEOL 201. Physical Geology. 3 units

Term Typically Offered: F, W, SP

Prerequisite: MATH 119.

Processes responsible for the Earth's rocks, structural surface features, geologic hazards, and natural resources, with emphasis on interactions with human activities. 3 lectures.

GEOL 203. The Geologic Record: Fossils and the History of Life. 4 units

Term Typically Offered: W

2020-21 or later catalog: GE Area B1

2019-20 or earlier catalog: GE Area B5

A historical account of life on Earth interpreted from the fossil record. Paleoenvironmental controls on the rise and decline of lineages of organisms deduced from stratigraphy, and from the composition, character, and geochemistry of sedimentary rocks. Identification of fossils. 3 lectures, 1 discussion. Fulfills GE Area B1 (GE Area B5 for students on the 2019-20 or earlier catalogs).

GEOL 206. Geologic Excursions. 1 unit

Term Typically Offered: F, SP

CR/NC

Field trips to places of geologic interest. The Class Schedule will indicate destinations. Students must provide their own transportation, food, and camping equipment. May be repeated for a maximum of 3 units provided field trips are taken to different locations. Credit/No Credit grading only. 1 laboratory.

GEOL 241. Physical Geology Laboratory. 1 unit

Term Typically Offered: F, W, SP

Corequisite: GEOL 102 or GEOL 201.

Properties and identification of minerals and rocks. Topographic maps and landform analysis. Geologic maps and interpretation of rock structure. 1 laboratory.

GEOL 270. Selected Topics. 1-4 units

Term Typically Offered: TBD

Prerequisite: Consent of instructor.

Directed group study of selected topics. The Class Schedule will list topic selected. Total credit limited to 8 units. 1 to 4 lectures.

GEOL 301. Physical Models in the Geosciences. 4 units

Term Typically Offered: F

Prerequisite: MATH 142; PHYS 141; and GEOL 201.

Development and analysis of geodynamical models. Stress and strain, flexure, heat flow, faulting, and elastic waves in the solid earth. Additional topics may include fluid flow, flow of natural materials, geochronology, and equations of state in high pressure mineral physics. 4 lectures.

GEOL 303. Computation and Visualization in the Geosciences. 3 units

Term Typically Offered: W

Prerequisite: GEOL 301 and one of the following: STAT 217, STAT 218, STAT 301, STAT 312, or STAT 321.

Introduction to scientific programming and data visualization for solving problems in the geosciences. Import and export of data, plotting data and maps, time series analysis, statistical description of data, and numerical approximations of equations. 2 lectures, 1 laboratory.

GEOL 305. Seismology and Earth Structure. 4 units

Term Typically Offered: SP

2020-21 or later: Upper-Div GE Area B

2019-20 or earlier catalog: GE Area B5, B6, or B7

Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; one course in GE Area B4 with a grade of C- or better (GE Area B1 for students on the 2019-20 or earlier catalogs); GEOL 303; or PHYS 132 or PHYS 142 and MATH 242 or MATH 244.

Elastic waves in layered media. Principle of the seismometer. Magnitude, seismic moment and energy calculations. Source mechanics. Major California faults and paleoseismology. Theory of plate tectonics. Seismic properties, structure, and composition of the Earth. Field trip required. 3 lectures, 1 laboratory. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog).

GEOL 309. Igneous Petrology. 3 units

Term Typically Offered: W

Prerequisite: GEOL 102 or GEOL 201; and ERSC 223.

Processes associated with melt generation and igneous crystallization with special attention to relationships with tectonic setting. Field trip required. Not open to students with credit in GEOL 310. 2 lectures, 1 laboratory.

GEOL 311. Metamorphic Petrology. 3 units

Term Typically Offered: SP

Prerequisite: GEOL 309.

Textures and minerals associated with the metamorphism of igneous and sedimentary rocks. Principles of metamorphic reactions and thermobarometry. Special attention to metamorphic processes in the context of plate tectonics. Field trip required. Not open to students with credit in GEOL 310. 2 lectures, 1 laboratory.

GEOL 330. Principles of Stratigraphy. 4 units

Term Typically Offered: SP

Prerequisite: GEOL 102 or GEOL 201, and GEOL 241.

Description and analysis of stratified rock and sediment. Sedimentology, diagenesis, transgressive/regressive sequences, bedform interpretation, marine and terrestrial sediment and sedimentary-rock sequence interpretation, and sequence stratigraphy. Required field trips. 3 lectures, 1 laboratory.

GEOL 400. Special Problems for Advanced Undergraduates. 1-2 units

Term Typically Offered: F, W, SP

Prerequisite: Consent of department chair.

Individual investigations, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter.

GEOL 404. Research Experience for Advanced Undergraduates. 1-2 units

Term Typically Offered: F, W, SP

CR/NC

Prerequisite: Consent of department chair.

Individual investigations, research, studies, or surveys of selected problems. Credit/No Credit grading only. Total credit limited to 4 units, with a maximum of 2 units per quarter.

GEOL 415. Structural Geology. 4 units

Term Typically Offered: F

Prerequisite: GEOL 241 and ERSC 223.

Recognition, interpretation, and depiction of geological structures. Understanding rock deformation through the study of faults and folds. 3 lectures, 1 laboratory. Required weekend field trips.

GEOL 416. Field-Geology Methods. 4 units

Term Typically Offered: W

Prerequisite: GEOL 102 or GEOL 201; and GEOL 415.

Collecting and interpreting field-geologic data. Description of sedimentary rocks and construction of stratigraphic columns. Mapping geologic structures in the field. Surficial geologic stratigraphy and surficial geologic mapping. Understanding geologic processes through field study. Communicating results of field study. 1 lecture, 3 activities. Crosslisted as ERSC/GEOL 416. Formerly ERSC/GEOL 401.

GEOL 417. Geologic Mapping. 4 units

Term Typically Offered: SP

Prerequisite: ERSC/GEOL 401 or ERSC/GEOL 416.

Bedrock geologic mapping on topographic maps and aerial photos. Surficial geologic mapping on topographic maps and aerial photos. Correlating and defining surficial geologic map units on the basis of soil development. Understanding landscape evolution using soil development 4 activities. Crosslisted as ERSC/GEOL 417. Formerly ERSC/GEOL 402.

GEOL 420. Applied Geophysics. 3 units

Term Typically Offered: F

Prerequisite: GEOL 201 and PHYS 141.

Introduction to geophysical exploration of the shallow subsurface: seismic refraction, seismic reflection, electrical resistivity, magnetic and gravity methods. Application to determination of subsurface structure, groundwater and mineral resources. Field trip required. 2 lectures, 1 laboratory.

GEOL 470. Selected Advanced Topics. 1-4 units

Term Typically Offered: TBD

Prerequisite: Consent of instructor.

Directed group study of selected topics for advanced students. Open to undergraduate and graduate students. The Class Schedule will list topic selected. Total credit limited to 8 units. 1 to 4 lectures.

GEOL 471. Selected Advanced Laboratory. 1-4 units

Term Typically Offered: TBD

Prerequisite: Consent of instructor.

Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Class Schedule will list topic selected. Total credit limited to 8 units. 1 to 4 laboratories.