GEOL Courses

GEOL 102. Introduction to Geology. 4 units
GE Area B3
Term Typically Offered: F, W, SP
Processes responsible for the Earth’s minerals, rocks, and structure
surface features. Volcanism; mountain building; plate tectonics;
weathering. Erosion and deposition by streams, glaciers, wind and waves.
Geological resources, earth hazards, and interaction of man with global
processes. 3 lectures, 1 discussion. Fulfills GE B3.

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. Fossils and the History of Life. 4 units
GE Area B5
Term Typically Offered: W
Evolution - creation controversy. Early earth and early life. Features,
lifestyles, origins, and histories of major invertebrate, vertebrate, and
plant groups. Mass extinctions. 3 lectures.

GEOL 205. Earthquakes. 4 units
GE Area B3
Term Typically Offered: TBD
World-wide seismicity and plate tectonics. Seismic waves and their
recording. Earth structure and composition. Intensity, magnitude, and
energy. Major California faults and earthquakes. Paleoseismology,
forecasting and prediction. Acceleration, resonance, and effects of
ground shaking on structures. Earthquake safety. Tsunamis. 3 lectures, 1
discussion. Fulfills GE B5.

GEOL 206. Geologic Excursions. 1 unit
CR/NC
Term Typically Offered: F, SP
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 243. Bedform Interpretation. 1 unit
Term Typically Offered: SP
Prerequisite: GEOL 201 and GEOL 203.
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 244. Principles of Stratigraphy. 4 units
Term Typically Offered: F
Prerequisite: 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 245. Marine Geology. 3 units
Term Typically Offered: SP
Prerequisite: 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 300. Special Problems for Undergraduates. 1-2 units
Term Typically Offered: TBD
Prerequisite: Consent of department chair.
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
GE Area B6
Term Typically Offered: W
Prerequisite: GEOL 303; or PHYS 132 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 B6.

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 crystalization
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 401. Field-Geology Methods. 4 units
Term Typically Offered: W
Prerequisite: GEOL 102 or GEOL 201, GEOL 241, GEOL 415, ERSC 223, ERSC 323.

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 401.

GEOL 402. Geologic Mapping. 4 units
Term Typically Offered: SP
Prerequisite: ERSC/GEOL 401.

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 402.

GEOL 404. Research Experience for Advanced Undergraduates. 1-2 units
CR/NC
Term Typically Offered: F, W, SP
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 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.