GEOLOGY (GEOL)

Courses

**GEOL 201. Advanced Field Geology. 3 Credits.**
Advanced field mapping techniques, analysis of field data, preparation of geological maps and reports. Prerequisite: GEOL 101.

**GEOL 217. Vermont Field Geology. 3 Credits.**
Field observations of rocks and surficial materials across northern Vermont are utilized to decipher the region's geologic history. Readings complement field work. Prerequisite: Graduate student standing.

**GEOL 231. Petrology. 4 Credits.**
The course covers the scope and methods of igneous, sedimentary and metamorphic petrology, and the geologic environments and processes relevant to the major rock types. Prerequisite: GEOL 110.

**GEOL 233. Environmental Isotope Geochem. 3 Credits.**
Course focuses on stable isotope geochemistry of low temperature processes occurring on and near the earth surface through lecture, laboratory, and seminar. Prerequisite: CHEM 031.

**GEOL 234. Global Biogeochemical Cycles. 3 Credits.**
Integrated perspective on biogeochemical cycles describing the transformation and movement of chemical substances in the natural environment, as seen on the global context. Prerequisite: CHEM 031.

**GEOL 235. Geochemistry of Natural Waters. 3 Credits.**
Basic concepts of chemical equilibria applied to natural waters, including thermodynamics, pH, oxidation-reduction, weathering, and solution equilibria. Prerequisite: Prerequisite: GEOL 110.

**GEOL 240. Tectonics. 3 Credits.**
Applications of igneous and metamorphic petrology to problems in tectonophysics, including petrochemistry of the earth's crust and upper mantle and the internal structure of orogenic belts. Prerequisites: GEOL 101, GEOL 110.

**GEOL 242. Basin Analysis. 3 Credits.**
This course examines the formation and evolution of sedimentary basins, including tectonic setting, sediment supply, and subsidence history. Prerequisite: GEOL 153.

**GEOL 246. X-ray Difractometry. 3 Credits.**
This course focuses on identification and characterization of materials using X-ray diffractometry. The course will include exercises using a modern powder diffractometer. Prerequisite: CHEM 032.

**GEOL 260. Structural Geology. 0 or 4 Credits.**
Examines processes and problems concerning the mechanical behavior of the Earth's crust and surface. Includes rock deformation stress, strain, and the interpretation of geological structures. Prerequisites: GEOL 101, GEOL 110.

**GEOL 263. Geochronology. 3 Credits.**
This course will survey the basic concepts of radioactive decay, mass spectrometry, and isotopic systems commonly used to quantify the timing of geologic events. Prerequisite: GEOL 110.

**GEOL 265. Geomicrobiology. 3 Credits.**
An introduction to microbial control of redox chemistry on Earth's surface, including field techniques and a detailed look at how microbes affect element cycling. Prerequisite: GEOL 135.

**GEOL 266. Microstructures. 3 Credits.**
This course will focus on deformation of rocks and minerals at the microscopic scale and the practical use of photographic analyses to unravel tectonic histories. Prerequisite: GEOL 101.

**GEOL 272. Regional Geology. 0 or 4 Credits.**
Discussion of the geology of a selected region of North America; a four-week summer field trip to the area in question. Prerequisites: GEOL 101, GEOL 110.

**GEOL 273. Geology of the Appalachians. 3 Credits.**
Origin of mountain belts; the Appalachian mountain system discussed in terms of tectonics and geologic processes active in modern continental margins. Prerequisites: GEOL 101, GEOL 110.

**GEOL 295. Advanced Special Topics. 1-18 Credits.**
See Schedule of Courses for specific titles.

**GEOL 296. Advanced Special Topics. 1-18 Credits.**
See Schedule of Courses for specific titles.

**GEOL 301. Intro to Graduate Studies. 1 Credit.**
For first year graduate students in Geology. Includes orientation to faculty, abstract and grant writing, comprehensive exams, talk preparation and scientific method in the Geosciences. Prerequisite: Graduate standing in Geology.

**GEOL 302. Intro Graduate Studies Geology. 1 Credit.**
For first year graduate students in Geology. Includes orientation to faculty, abstract and grant writing, comprehensive exams, talk preparation and scientific method in the Geosciences. Prerequisite: Graduate standing in Geology.

**GEOL 335. Aqueous Environmental Geochem. 3 Credits.**
This course focuses on the chemical equilibrium and kinetics principles governing water chemistry, including water interaction with the atmosphere, microbes and minerals. Prerequisite: Graduate standing.

**GEOL 351. Surface Proc & Quaternary Geol. 1-3 Credits.**
Discussion and critique of scientific literature pertaining to Earth surface history and processes. Critical examination of author's methods, data, and assumptions. Student-led discussions. Specific focus changes yearly. Prerequisite: Graduate standing in science, natural resources or engineering.

**GEOL 352. Environmental Geology Seminar. 1-3 Credits.**
Geologic constraints on environmental problems including: groundwater flow, contaminant transport, slope stability, climate change, sedimentation, deforestation and earthquake hazards. Extensive readings and student-led discussions. Prerequisite: Graduate standing in science, natural resources, or engineering.
GEOL 360. Structural Anyl Deformed Rocks. 4 Credits.
Mechanisms of rock deformation; fracture phenomena and analysis;
fault zone characteristics; fold generation analysis. Stress and strain
interpretation of deformational features in rocks and minerals. Field
work. Prerequisite: GEOL 260.

GEOL 361. Advanced Structural Geology. 3 Credits.
Selected topics in analytical structural geology. Prerequisite:
GEOL 260.

GEOL 371. Advanced Readings. 1-3 Credits.
Readings and research problems intended to contribute to the
program of graduate students in areas of geology for which formal
courses are not available. Prerequisite: Graduate standing in Geology.

GEOL 384. Teaching in the Geosciences. 1 Credit.
A review of the pedagogical underpinnings of introductory geology
and its laboratory activities.

GEOL 385. Teaching in the Geosciences. 1 Credit.
A review of the pedagogical underpinnings of introductory geology
and its laboratory activities.

GEOL 391. Master's Thesis Research. 1-9 Credits.