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## Geology Course Descriptions

### Note:

Some Geology courses include or require co-registration with a laboratory component. See descriptions for details.

GEOL 195, 295, 395, 495 – Special Topics (1-12)

GEOL 198, 298, 398, 498 – Tutorial (1-3)

GEOL 100 – Earth Science (3) Study of the earth and its history, minerals and rocks, earthquakes, plate-tectonic theory, Earth's interior, atmosphere, oceans, environmental problems and astronomy. Lab included. Fall and Spring. Gen Ed: SP & LB credit.

GEOL 101 – Environmental Geology (3) A study of geology and the human environment. Topics begin with the basics of geology: minerals and rocks, the earth's internal structure, earthquakes, volcanoes and plate tectonics. Surface processes affecting the environment include stream behavior and flooding, groundwater, and air pollution. The course examines laws governing the extraction and use of water, as well as energy sources and environmental concerns. Laboratory includes field trips in the Potsdam area and the use of geological and topographic maps. Fall or Spring. Gen Ed: SP & LB credit.

GEOL 102 – Ancient Life (3) Survey of evolution of life as documented by the fossil record. Theory of evolution. Fall. Gen Ed: SP credit.

GEOL 103 – Physical Geology (3) Minerals, rocks, rock deformation, aerial photos, maps, geological processes that shape the land, environmental geology. Lab required. Fall and Spring. Gen Ed: SP & LB credit.

GEOL 106 – Geology of Our National Parks (3) Study of geologic processes using national parks as examples. Processes studied include sedimentology, stratigraphy, volcanology, glaciology and tectonics. National parks studied include Grand Canyon, Arches, Mt. Rainier, Zion, Canyonlands, Badlands, Hawaii Volcanoes, Glacier, Yellowstone, Grand Tetons, Acadia and Shenandoah. Lab required. Spring, even years. Gen Ed: SP & LB credit.

GEOL 125 – Cycles of Nature (3) This course covers topics in earth systems science including geology, earth history, plate tectonics, the hydrosphere, the atmosphere, energy and the environment. The intent is to provide exposure to a wide variety of topics in the earth sciences. The course will be supplemented with discussions of current events and discoveries related to the earth sciences, and local geological features. Lab included. Fall and Spring. Gen Ed: SP & LB credit.

GEOL 204 – Historical Geology (1-2) Historical Geology is the second course in the geology sequence and builds upon the basic geologic principles introduced in 100-level courses. The first half of the course focuses on the methods and principles that geologists use to interpret Earth History; second half of the course focuses on Earth systems history (climate, oceans, atmosphere, geologic processes and life). Prerequisite: GEOL 100, 101, 103, 106, 125, or 195. Lab required. Fall and Spring. Formerly GEOL 104. Gen Ed: SP & LB credit.

GEOL 300 – Field Geology (3) Field studies in northern New York stressing map making, use of GPS, geologic cross sections, computer map construction. Fall. Lab.

GEOL 301 – Sedimentary Geology (4) Study of sediment transport and deposition, classification and description of clastic and carbonate sedimentary rocks, depositional environments, and an introduction to stratigraphy (emphasis is on lithostratigraphy, biostratigraphy, and sequence stratigraphy). Mandatory weekend field trip to southern New York. Prerequisite: GEOL 104 or 204. Lab required. Fall.

GEOL 302 – Principles of Paleontology (4) Topics covered in this class include: paleoecology, systematics, evolutionary development, functional

morphology, biogeography, diversity, and extinction. Labs focus on invertebrate organisms and their use as environmental indicators and in stratigraphic correlation. Prerequisite: GEOL 301 or permission for Biology majors or minors. Lab required. Spring. Gen Ed: WI & SI credit.

GEOL 311 – Mineralogy (4) The identification, classification and study of minerals including their atomic make-up and conditions under which they form. Review of the principles of chemistry and physics that govern the structure, formation and geological occurrence of minerals with emphasis on the rock-forming silicates. Laboratory includes the study of Adirondack minerals and ores, x-ray procedures, and the symmetry and classification of crystals. Field trips to the St. Lawrence Valley and Adirondack Mountains. Prerequisite: GEOL 104 or 204; Pre- or Co-requisite: CHEM 105. Lab required. Fall.

GEOL 321 – Optics and Petrology (4) Theory of light behavior in minerals and its application to study of rocks and minerals in thin section using petrographic microscopes. Study of origin and evolution of igneous and metamorphic rocks and relationship between their mineralogy and tectonic setting. Prerequisite: GEOL 311. Lab required. Spring.

GEOL 370 – Science in Society (3) This course is designed to guide students through the process of asking questions, finding reliable sources of information and formulating informed opinions about important, timely issues that are rooted in science. Issues for discussion are those that are not widely well understood, have a broad impact on our society and tend to be polarizing. Prerequisite: Junior or Senior standing. Spring.

GEOL 405 – Structural and Field Geology (4) Study of folds, faults and shear zones in the Earth's crust on macroscopic and microscopic scale. Lab. Field studies in northern New York. Prerequisites: GEOL 104 or 204 and Junior or Senior status. Lab required. Fall.

GEOL 406 – Hydrology-Geomorphology (3) A study of water and of processes that act on the Earth's surface. A study of the characteristics and behavior of water on and below the surface with emphasis on the study of contaminants and their flow in groundwater. Topics include rivers, groundwater, landslides and mass wastage, glaciers, wind and waves. Prerequisites: GEOL 103, 104, 301, 405. Not currently offered.

GEOL 407 – Geophysics (3) Geophysical methods of prospecting: seismic reflection and refraction, gravity and magnetics and electrical resistivity. Emphasis on fieldwork and computer modeling and processing of data in solving geological and environmental problems. Lecture & Lab. Prerequisite: Sophomore standing. Fall and Summer. Gen Ed: SP & LB credit.

GEOL 409 – Seismology and Plate Tectonics (3) Study of local and global seismicity in context of plate-tectonic theory. Computer analysis of local earthquakes recorded by the SUNY Potsdam Seismic Network. Lecture & Lab. Prerequisite: Sophomore standing. Spring. Gen Ed: SP & LB credit.

GEOL 420 – Geochemistry (3) Study of major and trace element distribution in rocks, magma formation, radiogenic isotope systematics, fluid inclusions, weathering, diagenesis, alteration, mineral stability, and stable isotope fractionation utilizing chemistry-based principals. Prerequisites: GEOL 311, CHEM 105. Co-requisites: GEOL 321, CHEM 106. Spring.

GEOL 421 – Environmental Geology Problems (3) Analysis of environmental problems and introduction to techniques to solve them. Stress is on problem solving. Topics include: land use planning, landslide potential, solid and liquid waste disposal, coastal erosion and water pollution. Weekly written reports. Spring.

GEOL 440 – Geologic Resources (3) Study the genesis and geology of ore deposits including base- and precious-metals, gems, coal, petroleum, and industrial rocks and minerals. Discuss how society uses each material, the environmental implications of doing so, and the remediation steps necessary to minimize the associated environmental impact. Prerequisite: GEOL 311. Co-requisite: GEOL 321. Lab required. Spring.

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GEOL 475 – Geology Laboratory Techniques (1) Experience in laboratory instruction under supervision and guidance of a faculty member. Prerequisites: GEOL 104 and permission. Graded S\*/U\*. Fall and Spring.

GEOL 480 – Geology Research (3) Original research designed to give practical experience in any area of geology. Open primarily to upper-division geology majors and only on advisement. Research conducted in cooperation with a geology professor. May not be taken as an overload. Graded S\*/U\*. Fall and Spring.