

GEOLOGICAL SCIENCE

Phone: (845) 257-3760

Location: Wooster Science Building, Room 202

The Department of Geological Sciences offers both undergraduate and masters degree programs. Through formal courses, field work, and research projects, the students develop an awareness of the geological processes that shape our planet, and their impact on society and the environment. The undergraduate major in geology offers concentrations in both General Geology and Environmental Geoscience.

Elementary education and secondary education concentrations in Earth Science are offered at both the undergraduate and masters levels.

These programs are described under the School of Education listings. An undergraduate degree in Environmental Geochemical Science, also offered by this department, has a separate listing. A minor in geology is available for those majoring in other fields.

Interdisciplinary in nature, the undergraduate degree in geology requires courses in geology and cognate areas. The General Geology option is recommended for those contemplating graduate work in the geological sciences. For any of the geology programs, GLG201 and GLG211 should be taken in the fall semester of the freshman year, followed by GLG301 in the spring. CHE201 and CHE211, CHE202 and CHE212 and MAT251 should also be taken in the freshman year. It is also possible to begin the major in the sophomore year with proper advising.

Transfer students should complete as many of the cognate requirements as possible before entering SUNY New Paltz. Ideally, one year each of college chemistry, physics, and calculus should be completed in addition to a one year laboratory sequence in geology (physical and historical geology).

It is important that all students seek advising early on so they can complete the major on time. Students should get their adviser's approval of elective courses selected "by advisement" before taking the courses. It is the students' responsibility to become familiar with the program requirements and to work out the details of their program with their advisers' aid. Additional advising information is available in the department office.

Students must earn a grade of C- or better in all courses required for the geology major or minor.

For non-majors interested in geology, or those considering a geology minor, the recommended sequence is GLG201 and GLG211 followed by GLG301.

Honor's Research

Honor's Research is for students who wish to conduct a specialized research project at the undergraduate level. Students who plan on obtaining an M.A. or Ph.D. are advised to enroll in this course if they satisfy the prerequisites. Honor's Research is a very good means of letting the student, as well as faculty at SUNY New Paltz and other schools, identify whether or not he or she is suited for graduate work.

In order to enroll in Honor's Research (GLG491) a student must maintain a cumulative average of at least 3.00, and be recommended by a geology faculty sponsor and the department chair. Guidelines for research projects are available in the department office, and should be carefully read prior to meeting with the department chair to discuss the program.

Majors

- Geology - General Track (<http://catalog.newpaltz.edu/undergraduate/majors-minors/science-engineering/geological-science/major-geology-general-track>)
- Geology - Environmental Geoscience Track (<http://catalog.newpaltz.edu/undergraduate/majors-minors/science-engineering/geological-science/major-geology-environmental-geoscience-track>)
- Five-Year Combined BA Geology/MAT Adolescence Education: Earth Science (<http://catalog.newpaltz.edu/undergraduate/majors-minors/science-engineering/geological-science/five-year-combined-ba-geology-mat-adolescence-education-earth-science>)

Minor

- Geology (<http://catalog.newpaltz.edu/undergraduate/majors-minors/science-engineering/geological-science/minor-geology>)

Undergraduate

GLG120. Weather and Environment . 4 Credits.

A non-mathematical introduction to the basic principles of weather and weather forecasting and their effect on man. Laboratory studies of weather maps and related charts.

GLG193. Geological Selected Topic. 3-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

GLG199. Modular Course. 0 Credits.

GLG201. Physical Geology. 3 Credits.

Basic concepts of geology. Minerals, rocks, and rock-forming processes. Geologic time and age dating. Erosion, streams, groundwater, and glaciers. Geologic structures, earthquakes, volcanoes, plate tectonics, and other geologic processes. COURSE FEE.

Restrictions:

- Must have the following level: Undergraduate

GLG202. Historical Geology. 4 Credits.

Geological and geographic developments of the continents throughout the earth's history, with emphasis on North America. Methods used in calculating the age of our planet, and interpreting the history of its rocks. Evolution of plants and animals through geologic time. In the laboratory, geologic maps and a few common fossils are studied. Local and regional field trips. COURSE FEE.

Prerequisites:

- GLG 201 with a minimum grade of C-

Restrictions:

- Must have the following level: Undergraduate

GLG205. Environmental Geology . 4 Credits.

The geological system as a framework for understanding environmental problems; man and his interactions with geological systems. Conservation, utilization, and management of natural resources. Field trips. COURSE FEE.

GLG211. Physical Geology Laboratory. 1 Credit.

Laboratory study of minerals, rocks, topographic maps, and geologic maps. Field trips.

Restrictions:

- Must have the following level: Undergraduate

GLG293. Geological Selected Topic. 2-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

GLG295. Indep Study Geology. 1-12 Credits.**GLG299. Phys Glg-Fld Excur . 1 Credit.****GLG303. Geomorphology. 4 Credits.**

Overview of surficial geological processes and how they control landscapes evolution. A geological investigation of hillslopes, rivers, deserts, glaciers, coasts, and oceans with an emphasis on local and regional landscapes and environmental implications. COURSE FEE.

Prerequisites:

- (GLG 201 with a minimum grade of C- or GLG 220 with a minimum grade of C-) and (Math Placement Level with a score of 5 or MAT 181 with a minimum grade of C-)

GLG305. Paleontology . 4 Credits.

Principles and methods in the study of fossils; morphology, classification and evolution, ecologic relationships between organisms and sedimentary systems, geographic distribution, and stratigraphic range. Field trips.

Prerequisites:

- GLG 301 with a minimum grade of C- or GLG 202 with a minimum grade of C-

GLG311. Mineralogy and Crystallography . 4 Credits.

Basic elements of solid internal and external crystallography and principles of crystal chemistry and geochemistry. Properties, occurrence, geochemistry, and hand specimen identification of the more common economic and rock-forming minerals. Field trips. COURSE FEE.

Prerequisites:

- CHE 201 with a minimum grade of C- and GLG 201 with a minimum grade of C- or GLG 220 with a minimum grade of C-

GLG313. Optical Mineralogy . 3 Credits.

Theory of the transmission of polarized light through crystalline solids. Use of the polarizing microscope in mineral identification. Optical properties of the common rock-forming minerals.

GLG314. Petrology . 4 Credits.

Study of the igneous, metamorphic and sedimentary rocks that form the solid earth. Rock composition, classification, distribution and origin. Volcanic, tectonic and other environments of rock formation. Phase diagrams, age dating, and rock chemistry. Laboratory microscope study of thin sections. Field trips. COURSE FEE.

Prerequisites:

- CHE 202 with a minimum grade of C- and GLG 311 with a minimum grade of C-

GLG331. Stratigraphy-Sedimentation . 4 Credits.

Stratified rocks, their formation today as clues to the formation of similar rocks in the past, their local descriptions, their correlation in a regional and world-wide framework, and the principles and methods used in interpreting the geologic history they record. Laboratory and field methods in the study of sedimentation, sedimentary rocks and stratigraphic successions found in outcrops. COURSE FEE.

Prerequisites:

- (GLG 301 with a minimum grade of C- or GLG 202 with a minimum grade of C-) and (Math Placement Level with a score of 5 or MAT 181 with a minimum grade of C-)

GLG334. Principles of Oceanography . 4 Credits.

The physical, chemical, geological, biological, and economic aspects of the science of oceanography; properties of seawater, ocean dynamics, coastal processes, marine sediments, sea-floor spreading, and continental drift, sea life fisheries, petroleum and the sea, marine technology, etc. Field trips. Laboratory.

GLG339. Natural Resources and Energy . 3 Credits.

Relation of the production of energy and its environmental impact on the finite nature of our natural resources. Review and critical evaluation of past, present, and future energy technologies.

GLG346. Environmental Impact Assessment. 3 Credits.

Study of the ways by which man's impact on nature and the environment is assessed and evaluated. Aspects of Environmental Impact Statements that are of significance to environmental geology, including air quality, meteorology, water quality, hydrogeology, land use, waste management, energy use and conservation.

Prerequisites:

- GLG 205 with a minimum grade of C- or (GLG 201 with a minimum grade of C- or GLG 220 with a minimum grade of C-)

GLG393. Geological Selected Topic. 3-12 Credits.

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GLG399. Modular Course. 0 Credits.**GLG405. Structure and Tectonics. 4 Credits.**

Study of the structure and deformation of the Earth's crust. Includes rock mechanics, faulting, fabric, geometric analysis, diapirism, and tectonics. Laboratories cover geologic map interpretation, use of spherical projections, and field work. Field trips. COURSE FEE.

Prerequisites:

- (GLG 201 with a minimum grade of C- or GLG 220 with a minimum grade of C-) and GLG 331 with a minimum grade of C- and PHY 201 with a minimum grade of C- and (Math Placement Level with a score of 5 or MAT 181 with a minimum grade of C-)

GLG407. Hydrogeology. 4 Credits.

Physical properties of groundwater flow, well hydraulics, water quality, the occurrences and distribution of groundwater, and to refine general quantitative and computer skills. COURSE FEE.

Prerequisites:

- (GLG 201 with a minimum grade of C- or GLG 220 with a minimum grade of C-) and PHY 201 with a minimum grade of C- and CHE 201 with a minimum grade of C- and (Math Placement Level with a score of 5 or MAT 181 with a minimum grade of C-)

GLG435. Field Geology . 4 Credits.

Problems and methods of geologic field study. Use Brunton and Silva compasses, GPS units, field data collection and analysis, solving of geologic field problems, construction of a geologic map, and report writing. Primarily taught in the field.

Prerequisites:

- GLG 338 (may be taken concurrently) with a minimum grade of C- or GLG 405 (may be taken concurrently) with a minimum grade of C-

GLG446. Paleoclimatology. 3 Credits.

Earth's climate change history from the records of ocean sediments, glacial ice, and other sources. Investigation will include geochronology techniques, mechanisms for gradual and abrupt climate changes, and implications for future climate variability.

Prerequisites:

- GLG 303 with a minimum grade of C- or GLG 331 with a minimum grade of C- or EGS 370 with a minimum grade of C-

Restrictions:

- Must have the following field(s) of study (major, minor or concentration):
 - Geology (510)
 - Geology (GLG)
 - Earth Science B-6 (601T)
 - Environmental Geochem Science (EGS)
 - Adolescence Ed: Earth Science (442)
 - Environmental Geochem Science (519)

GLG475. Geology Research Project 1 . 3 Credits.

Students will undertake a two semester research project, under the guidance of a faculty mentor, focusing on a detailed examination of a real world environmental problem. The project will culminate in a written document and an oral presentation in the Senior Seminar.

Restrictions:

- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
 - Environmental Geochem Science (519)
 - Geology (510)

GLG476. Geology Research Project 2 . 3 Credits.

Continuation of GLG475.

Prerequisites:

- GLG 475 with a minimum grade of C-

Restrictions:

- Must have the following field(s) of study (major, minor or concentration):
 - Environmental Geochem Science (519)
 - Geology (510)

GLG481. Field Excursion (1-3) . 1-12 Credits.

Geology of a selected area of North America. Readings and discussions of the detailed tectonic and petrological evolution of selected classical geologic areas. Field excursions to type areas. May be repeated for credit provided listed topic changes. COURSE FEE APPLIES TO SOME SECTIONS.

GLG490. Seminar in Geology (2-4) . 0 Credits.

Current problems and projects in geology. Developing ability to evaluate evidence critically and to understand current geological literature.

GLG491. Honor's Research . 4 Credits.

Individual advanced research in geology. Students are expected to complete a research thesis in consultation with instructor and chair.

GLG492. Research in Geology (1-4) . 1-12 Credits.

Laboratory or field research project to be completed in consultation with a geology faculty member in accord with the department guidelines for research.

GLG493. Geological Selected Topic. 3-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

GLG494. Fieldwork In Geology. 1-12 Credits.**GLG495. Indep Study Geology. 1-12 Credits.****GLG499. Modular Course. 0 Credits.****Related**