

Department of Earth and Environmental Science

Geology

Listed below are the requirements for the major and minor in Geology along descriptions of Geology courses. Requirements and course descriptions are taken from the 2020-2021 University of Mount Union Undergraduate Catalog. For the most up to date information and descriptions of all university courses see the latest undergraduate catalog on the University's web page.

The Department of Earth and Environmental Science offers a Geology program which is designed to give the student a solid foundation in understanding the materials, processes and history of the earth. Programs of study are available for those students who plan to enter graduate schools and professional careers as well as for those students who intend to terminate their studies with the bachelor's degree. Opportunities are available for students who wish to include geology as part of a double major or self-defined major. Each student works closely with department faculty members in developing a course of study that best suits individual objectives.

Requirements for the Major in Geology

Required Geology Courses	Semester Hours
GEO 112N Physical Geology or GEO 116N Investigation Earth	4
GEO 212 Historical Geology	4
GEO 301V Earth Materials	4
GEO 302 Igneous and Metamorphic Petrology	4
GEO 325 Stratigraphy and Sedimentation	4
GEO 330 Structural Geology	4
GEO 381- Seminar	2
GEO 384 Senior Culminating Experience or GEO 494	4
GEO 425 Honors Thesis/Project	4
Eight additional hours of GEO coursework (may include ENV 280)	8

Total 38

Required extra-departmental courses	Semester Hours
MTH 140 Precalculus	4
or	
MTH 141 Calculus I	4
CHE 110N Foundations of Chemistry	4
or	
CHE 120N Concepts in Chemistry	4
PHY 101N General Physics I	4
or	
BIO One four semester hour BIO course	4

Total 50

Certain requirements may be waived at the discretion of the department if the student presents acceptable alternatives.

Completion of a summer course at an accredited field camp or completion of a summer research project is recommended for geology majors intending to continue advanced studies in graduate school. The amount of credit for such a course which can be applied toward the degree requirements will not exceed seven semester hours.

Students planning graduate study should note that most geology departments require two courses each in chemistry, physics and calculus. Some graduate programs require a reading knowledge of a second language.

Field Trips

Field trips constitute an integral part of the geology curriculum, and students are strongly encouraged to participate in such trips. Extended field trips may be incorporated into the following courses: GEO 212, 302, 320, 325 and 330.

Requirements for the Minor in Geology

Required Geology Courses		Semester Hours
GEO 112N	Physical Geology	4
or		
GEO 116N	Investigation Earth	4
GEO 212	Historical Geology	4
Additional 8 semester hours of geology coursework at the 200 level or higher.		8
Total		16

Requirements for the Minor in Earth Science

Required Geology Courses		Semester Hours
GEO 112N	Physical Geology	
or		
GEO 116N	Investigation Earth	4
GEO 212	Historical Geology	4
One additional GEO course at the 200 level or higher		4
Required Extra-Departmental Courses		
PHY 120N	Astronomy: A Survey	4
Any One from the Following Courses		
ENV 190N	Introduction to Environmental Science	4
CHE 100N	Chemistry in Society	4
PHY 110	Concepts of Physics	4
Total		20

Requirements for Honors in Geology

Students are eligible to enter the Honors Program in geology if they have at least a 3.5 grade point average in the major or permission of the Honor Review Board.

To receive honors in geology, a student must have at least a 3.5 grade point average in the major at graduation and honors credit in courses that total a minimum of 12 semester hours. One of the courses required is GEO 494 Honors Thesis/Project that may be taken for three to six credit hours. For permission to register for an honors thesis/project, a completed Honors Application and Registration form must be filed with the director of Honors Programs by the end of the twelfth week of classes of the semester prior to doing the thesis. Students must earn at least a "B+" in the course to earn honors credit.

Other courses students may take for honors in geology include any geology course numbered 200 or higher. For permission to register for a course with honors in the major, a completed Application and Registration form must be filed with the director of Honors Programs by the end of the third week of classes of the semester in which the course is taken. Students must earn at least a "B+" in the course to earn honors credit.

Geology Course Descriptions

GEO 112N Physical Geology: How the Earth Works

An examination the natural processes that shape the earth's past, present and future and their impact on the residents of the planet. Course will also introduce the methods scientists use to study the Earth. Topics addressed include the formation of earth materials, natural hazards such as volcanoes and earthquakes, plate tectonics and mountain building, and earth history. There will be three hours of classroom study and one two-hour lab each week. Students who complete GEO 112 cannot also receive credit for GEO 116. 4 Semester Hours.

GEO 116N Investigation Earth

A hands-on exploration of the dynamics that shape planet Earth and an introduction to methods scientists use to study the Earth's past, present, and predict its future. The course will examine the origin, evolution, and interaction of the Earth's lithosphere,

hydrosphere and atmosphere and the impact these interactions have had on the Earth's history and on human habitation of the planet. Students who complete GEO 116 cannot also receive credit for GEO 112. Five hours of combined lecture and lab per week. 4 Semester Hours.

GEO 199 Special Topics

See All-University 199 course description.

GEO 210V Hydrology and Water Resources

A study of water properties, occurrence, distribution, and movement and their relationship with the environment within each phase of the hydrological cycle. The course also examines water quantity and quality issues, and water management policies. Prerequisite: BIO 141 or ENV 190 or GEO 112 or GEO 116 or consent of the instructor. Three class hours and one three-hour laboratory per week. Explorations prerequisite: Successful completion of all four Foundations courses or the WOC Portfolio. Explorations credit may only be earned for a course if this prerequisite is completed prior to the commencement of the course. 4 Semester Hours.

GEO 212 Historical Geology

An investigation of the physical and biologic processes that shape the earth and how those processes are recorded in the rock record. The geologic history of North America will be examined based on the evidence revealed by the rocks and fossils of the continent. Prerequisite: GEO 112 or GEO 116 or instructor's permission. Three class hours and one two-hour laboratory session per week. 4 Semester Hours.

GEO 220 History of Life

A study of the basic principles used by paleobiologists to understand the history of life on Earth, and an application of those principles through a survey of major events and trends in the evolution and diversification of life. Offered in alternate years. Prerequisites: open to sophomores, juniors and seniors. 4 Semester Hours.

GEO 270 Regional Geology

An examination of the geology, geomorphology and geologic history of selected regions of North America. Emphasis will be placed on the use of basic geologic principles in the interpretation of geologic features and landforms. Prerequisites: GEO 112 or GEO 116, GEO 212 or permission of the instructor. Four class hours per week. 4 Semester Hours.

GEO 299 Special Topics

See All-University 299 course description.

GEO 301V Earth Materials

An introduction to the materials that make up the Earth and the tools used to study these materials. Emphasis is placed on the identification, classification and interpretation of the geological significance of minerals. The course introduces crystallography, physical mineralogy, crystal chemistry, optical mineralogy, x-ray diffraction, and hand sample petrography. The origin and environmental impacts of mineral resources are also studied. Prerequisite: GEO 112 or GEO 116. Three class hours and one two hour laboratory session per week. Offered in alternate years. Explorations prerequisite: Successful completion of all four Foundations courses or the WOC Portfolio. Explorations credit may only be earned for a course if this prerequisite is completed prior to the commencement of the course. 4 Semester Hours.

GEO 302 Igneous and Metamorphic Petrology

A study of the igneous and metamorphic rocks and their significance to the origin and evolution of the earth's crust. Emphasis placed on the identification, physical and chemical classification, petrogenesis, and tectonic significance of igneous and metamorphic rocks. Prerequisite: GEO 301V. Three class hours and one two hour laboratory session per week. Offered in alternate years. 4 Semester Hours.

GEO 325 Sedimentation and Stratigraphy

An examination of the components of sedimentary deposits, processes of sediment deposition in different environments and sedimentary rock formation. The sedimentary rocks are placed in a time-stratigraphic perspective through correlation and basin analysis. Prerequisites: GEO 112 or GEO 116, GEO 212. GEO 301V is recommended but not required. Three class hours and one two hour laboratory session per week. Offered in alternate years. 4 Semester Hours.

GEO 330 Structural Geology

A study of deformation in the Earth's crust at all scales. Emphasis on recognition and analysis of structural features and interpretation of their tectonic significance. Prerequisites: GEO 112 or GEO 116, GEO 212, MTH 140 or equivalent. Three class hours and one two hour laboratory session per week. Offered in alternate years. 4 Semester Hours.

GEO 381-384 Geology Seminar

A review of classic papers and current publications relevant to the broad spectrum of earth sciences. Each semester students will prepare a written report and give a presentation on a subject of their own choosing that is of current geological interest. Normally

taken in junior and senior years. Each student is responsible for giving one seminar presentation each semester. Regular attendance at scheduled seminars is also required. Prerequisite: Registration only by permission of the instructor. 0.5 Semester Hours each semester.

GEO 385 Directed Studies in Earth Sciences

Studies relevant to a topic selected by the student in conference with the instructor. The study may take the form of library research, discussion, or field or laboratory investigation under close supervision of the instructor. The study may represent an extension of previous course work. Open to advanced students majoring in geology. Prerequisite: Registration only by permission of the instructor. May be taken more than one semester. 1- 4 Semester Hours.

GEO 399 Special Topics

See All-University 399 course description.

GEO 410 Research

Independent study and research in earth science. May be taken on an interdepartmental basis with permission of the departments involved. Research projects are determined by the student's interest. A formal presentation of the results of the research is required. Open to advanced students majoring in geology who have demonstrated a desire and an aptitude for independent research. Prerequisite: Registration only by permission of the instructor. May be taken more than one semester. 1 - 4 Semester Hours.

GEO 425 Senior Culminating Experience

A two-semester course designed to fulfill the University requirements for a Senior Culminating Experience. This course is required of all geology majors. Students will develop and conduct an independent scientific research project and present the results as a written report and an oral presentation. A grade of "In Progress" will be assigned at the end of the first semester. The final grade will be entered for both semesters at the end of the second semester. Prerequisites: Permission of the instructor. 2 Semester Hours each semester for a total of 4 Semester Hours.

GEO 494 Honors Thesis/Project

A research/project course designed to meet the needs of the individual student seeking honors in the major at graduation. Prerequisites: junior or senior standing, and approval of the instructor, the department chair and the Honors Review Board. Credit variable, 4-6 Semester Hours.