

GEOSCIENCES

Geoscientists focus on problems related to how the Earth works, and our students are given opportunities to build the skills necessary for understanding the Earth System. Through a variety of field and laboratory experiences, our curriculum emphasizes hands-on learning. Students may find employment opportunities in the Earth resources field, environmental consulting, the government sector, or a variety of other career paths.

Transfer to College of Arts & Sciences

Students should apply to the college upon the attainment of:

- a cumulative GPA of 2.0 or better (includes transfer coursework until 30 credits are earned at UA)
- a major GPA of 2.0 or better (includes transfer coursework until 30 credits are earned at UA)
- 30 credits completed including both required English composition courses and 3 credits of mathematics or statistics that meets the General Education requirement

Students can arrange inter-college transfers through an appointment with their academic advisor; advisor contact information is listed in "My Akron."

Placement

A student is encouraged to check with his/her major department and with the Career Center, Student Union 211, (330) 972-7747, regarding employment opportunities in the field.

College of Arts & Sciences

Degree requirements in Arts and Sciences include the demonstration of ability to use another language by completion of the second year of a foreign language or sign language and a minimum of 40 credits of 300/400 level courses (excluding workshops) consisting of either:

- Upper level (300/400) courses both in and outside the student's major
- Any courses outside the major department as specified in and approved by the student's major department chair (permission should be obtained prior to enrollment) except workshops

Geology Websites

- For careers in Geoscience visit: <http://www.earthscienceworld.org>
- Ask-a-Geologist at <http://walrus.wr.usgs.gov/ask-a-geologist/>
- Geological Survey at <http://www.usgs.gov>
- Association of American State Geologists at <https://www.stategeologists.org/>
- Link to other geology websites: <http://www.uakron.edu/colleges/artsci/depts/geology/links.php>

Geosciences Contact

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330-972-7659
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- Environmental Studies, Certificate (<https://bulletin.uakron.edu/undergraduate/colleges-programs/arts-sciences/geosciences/environmental-studies-certificate/>)
- Geology, BS (<https://bulletin.uakron.edu/undergraduate/colleges-programs/arts-sciences/geosciences/geology-bs/>)
- Geology, Earth Science, BA (<https://bulletin.uakron.edu/undergraduate/colleges-programs/arts-sciences/geosciences/geology-earth-science-ba/>)
- Geology, Environmental Science, BA (<https://bulletin.uakron.edu/undergraduate/colleges-programs/arts-sciences/geosciences/environmental-science-ba/>)
- Geology, Minor (<https://bulletin.uakron.edu/undergraduate/colleges-programs/arts-sciences/geosciences/geology-minor/>)

Geology (GEOL)

GEOL 100 Earth Science (3 Units)

Introduction to earth science for non-science majors. Survey of earth in relation to its physical composition, structure, history, atmosphere, oceans; and relation to solar system and universe. (Formerly 3370:100)

Ohio Transfer 36: Yes

Gen Ed: Natural Science

GEOL 101 Introductory Physical Geology (4 Units)

A study of the nature of earth, its materials, and the processes which continue to change it. Laboratory, field trips. (Formerly 3370:101)

Ohio Transfer 36: Yes

Gen Ed: Natural Science with Lab

GEOL 102 Introductory Historical Geology (4 Units)

Prerequisite: GEOL 101 or [GEOL 104 and GEOL 211] or permission. Geologic history of earth, succession of major groups of plants and animals interpreted from rocks, fossils. Laboratory, field trips. (Formerly 3370:102)

Gen Ed: Natural Science with Lab

GEOL 103 Natural Science: Geology (3 Units)

Study of basic principles and investigative techniques in various fields of geology with emphasis on relationship of geologic processes to society. (Formerly 3370:103)

GEOL 104 Exercises in Physical Geology (1 Unit)

Prerequisite: GEOL 100 or GEOL 103 or GEOL 200 or GEOL 211 or permission of geology adviser. Laboratory exercises on the identification of earth materials and the utilization and interpretation of geologic data and maps. (Formerly 3370:104)

GEOL 105 Geology for Engineers (3 Units)

Introduction of physical geology to engineers, including mechanics, hydraulics and case studies that illustrate interactions between geology and engineering. Laboratory, field trips. (Formerly 3370:105)

GEOL 121 Dinosaurs (1 Unit)

Introductory course exploring the geological occurrence, mode of fossilization, evolutionary development, habits, and sudden extinction of the largest known land vertebrates. (Formerly 3370:121)

Gen Ed: Natural Science

GEOL 122 Mass Extinctions & Geology (1 Unit)

Catastrophic changes in plants and animals have occurred throughout earth history. The causes of these extinctions have sparked debate which has enlivened the scientific world. (Formerly 3370:122)

Gen Ed: Natural Science

GEOL 125 Earthquakes: Why, Where, When? (1 Unit)

Causes and effects of earthquakes, geological settings for earthquakes, seismic measurements, mechanical response of rock to stress, earthquake prediction and precautionary measures. (Formerly 3370:125)

GEOL 126 Natural Disasters & Geology (1 Unit)

A study of the earth's natural hazards including earthquakes, landslides, meteorites and tsunamis. (Formerly 3370:126)

GEOL 127 The Ice Age & Ohio (1 Unit)

Introductory course covering the effects of the ice age on the geology, vegetation, fauna and economy of Ohio. (Formerly 3370:127)

GEOL 128 Geology of Ohio (1 Unit)

Survey of Ohio's geologic setting and history, natural resources, landforms, and their significance in terms of human activity, from early settlement to future economy. (Formerly 3370:128)

GEOL 129 Medical Geology (1 Unit)

Abundance and distribution of trace elements in surface and groundwater, soils and rocks. The effects of trace elements to health through dose-response relationships. (Formerly 3370:129)

GEOL 130 Geologic Record of Climate Change (1 Unit)

Examines evidence for natural climate changes in geologic past and evaluates the role of modern society in influencing future climate. (Formerly 3370:130)

Gen Ed: Natural Science

GEOL 132 Gemstones & Precious Metals (1 Unit)

Introduction to minerals which form gemstones and precious metals. Topics to be covered include physical properties, geologic occurrences, and geographic locations of major deposits. (Formerly 3370:132)

GEOL 133 Caves (1 Unit)

Topics include: karst processes and the origin of caverns; carbonate depositional environments and the origin of limestones; environmental problems associated with karst landscapes (Formerly 3370:133)

Gen Ed: Natural Science

GEOL 134 Hazardous & Nuclear Waste Disposal (1 Unit)

Disposition of hazardous waste in secured landfill site. Geologic factors which determine the selection of low-level and high-level radioactive waste sites. (Formerly 3370:134)

GEOL 135 Geology of Energy Resources (1 Unit)

Topics include the origin of hydrocarbon and coal deposits, global distribution of energy resources, environmental impact of energy consumption. (Formerly 3370:135)

Gen Ed: Natural Science

GEOL 137 Earth's Atmosphere & Weather (1 Unit)

Structure and composition of the atmosphere; earth's radiation budget; atmospheric moisture, clouds and precipitation; weather systems and storms, severe weather, Ohio weather. (Formerly 3370:137)

Gen Ed: Natural Science

GEOL 139 Current Topics in Geology (1 Unit)

(May be repeated for up to 2 credits.) Special topics offered once or only occasionally in areas where no formal course exists. (Formerly 3370:139)

GEOL 140 Rocky Mountain National Parks (1 Unit)

Badlands, Yellowstone, Grand Canyon and other Rocky Mountain National Parks will be used to illustrate basic principles of geology. (Formerly 3370:140)

GEOL 141 Natural Environment of China (1 Unit)

Introduction to geographical and geological environments of China. Geography and geology of geoparks will be presented and discussed as examples (Formerly 3370:141)

GEOL 171 Introduction to the Oceans (3 Units)

Provides a basic introduction to the oceans. Topics include formation of the oceans, ocean circulation, waves and tides, marine animals, marine communities, and climate change. (Formerly 3370:171)

Ohio Transfer 36: Yes

Gen Ed: Natural Science

GEOL 200 Environmental Geology (3 Units)

Analysis of geologic aspects of the human environment with emphasis on geologic hazards and environmental impact of society's demand for water, minerals and energy. (Formerly 3370:200)

Ohio Transfer 36: Yes

Gen Ed: Natural Science

GEOL 201 Exercises in Environmental Geology I (1 Unit)

Pre/Corequisite: GEOL 200. Recognition, and evaluation of environmental problems related to geology through laboratory exercises and demonstrations which apply concepts discussed in introductory geoscience courses. Laboratory. (Formerly 3370:201)

Ohio Transfer 36: Yes

Gen Ed: Natural Science with Lab

GEOL 203 Exercises in Environmental Geology II (1 Unit)

Prerequisite: GEOL 201. Pre/Corequisite: GEOL 200. Recognition and evaluation of environmental problems related to geology. (Continuation of 201) Laboratory. (Formerly 3370:203)

Ohio Transfer 36: Yes

Gen Ed: Natural Science with Lab

GEOL 211 Introduction to Environmental Science (3 Units)

Interdisciplinary analysis of our relationship with nature and dependence upon the environment, with emphasis on evaluation of current environmental problems and rational solutions. (Formerly 3370:211)

Ohio Transfer 36: Yes

Gen Ed: Natural Science

GEOL 230 Mineral Science (4 Units)

Prerequisite: GEOL 101 or [GEOL 104 and GEOL 211]. Corequisites: CHEM 151 and CHEM 152. Crystallography and chemistry of minerals. Topics also covered include physical, chemical and optical properties, occurrences and uses of the common non silicate minerals. Laboratory, field trips. (Formerly 3370:230)

Gen Ed: Natural Science with Lab

GEOL 231 Silicate Mineralogy and Petrology (4 Units)

Prerequisites: [GEOL 101 and GEOL 230] or appropriate test score. Corequisites: CHEM 151 and CHEM 152. Physical and chemical properties, occurrence, and uses of common silicate minerals, followed by megascopic and microscopic identification, classification, and petrogenesis of rocks. Laboratory. (Formerly 3370:231)

GEOL 301 Engineering Geology (3 Units)

Prerequisite: GEOL 101 or [GEOL 100 and GEOL 104] or [GEOL 104 and GEOL 211] or permission of instructor. Presents quantitative analysis of geologic features and processes and is supported by the study of case histories. Lecture, lab, field study, field trips. (Formerly 3370:301)

GEOL 310 Geomorphology (3 Units)

Prerequisite: GEOL 101 or [GEOL 100 and GEOL 104] or [GEOL 104 and GEOL 211]. Study of landforms as a function of structure, process, and time. Laboratory, field trips. (Formerly 3370:310)

GEOL 324 Sedimentation & Stratigraphy (4 Units)

Prerequisite: GEOL 102. Introduction to sedimentary processes and environments; stratigraphic principles and techniques. Hand specimens, thin sections, and sedimentary sequences studied. Laboratory, field trips. (Formerly 3370:324)

GEOL 350 Structural Geology (4 Units)

Prerequisite: GEOL 101 or [GEOL 100 and GEOL 104] or [GEOL 104 and GEOL 211]. Origins and characteristics of folds, faults, joints and rock cleavage. Structural features of sedimentary, igneous and metamorphic rocks. Laboratory, field trips. (Formerly 3370:350)

GEOL 355 Contemporary Issues in Environmental Science (3 Units)

Prerequisite: GEOL 100, GEOL 101, or GEOL 211. Advanced interdisciplinary analysis of our relationship with nature and dependence upon the environment, with emphasis on evaluation of current environmental problems and rational solutions. (Formerly 3370:355)

GEOL 360 Paleobiology (4 Units)

Prerequisite: GEOL 102 or BIOL 111. Introductory course emphasizing morphology and evolution of major invertebrate groups with consideration of practical applications of paleontology. Laboratory, field trips. (Formerly 3370:360)

GEOL 371 Oceanography (4 Units)

Prerequisite: GEOL 101. Study of the dominant feature of our planet, the oceans, emphasizing ocean basins evolution, and physical, chemical and biological processes in the various marine environments. Field trips. (Formerly 3370:371)

GEOL 405 Archaeological Geology (3 Units)

Prerequisite: GEOL 101. Provides background in geologic principles and techniques relevant to archaeologists. Topics include stratigraphy, absolute dating, locality assessment, zooarchaeology, taphonomy, and remote sensing. Laboratory, field trips. (Formerly 3370:405)

GEOL 407 Archaeogeophysical Survey (3 Units)

Prerequisites: ANTH 110 or GEOL 101 or GEOG 310. Advanced instruction in subsurface geophysical survey techniques in archaeology. Emphasis on magnetic gradiometry and electrical resistivity techniques, image processing and geological and archaeological interpretation. (Formerly 3370:407)

GEOL 410 Regional Geology of North America (3 Units)

Prerequisites: GEOL 101 and GEOL 102. Examination of physiographic provinces of North America emphasizing structure, tectonic setting, stratigraphy and processes responsible for landforms in each province. Laboratory, field trips. (Formerly 3370:410)

GEOL 411 Glacial Geology (3 Units)

Causes and effects of Pleistocene expansion of polar ice masses with emphasis on glacial deposits and world climatic changes. Laboratory, field trips. (Formerly 3370:411)

GEOL 421 Coastal Geology (3 Units)

Prerequisites: GEOL 101 and GEOL 324, or permission of instructor. Study of the origins and evolution of coasts and coastal deposits with particular attention paid to the interaction of waves and currents with sediment, and the development of associated sedimentary features. Field trips. (Formerly 3370:421)

Gen Ed: Complex Issues Facing Society

GEOL 425 Principles of Sedimentary Basin Analysis (3 Units)

Prerequisites: GEOL 324 and GEOL 360, or permission. Primarily the study of depositional systems, regional and global stratigraphic cycles, and sedimentation and plate tectonics. (Formerly 3370:425)

GEOL 432 Optical Mineralogy - Introductory Petrology (3 Units)

Prerequisites: GEOL 230 and GEOL 231. Optical techniques for identification, characterization, and classification of minerals and rocks using the petrographic microscope. Laboratory. (Formerly 3370:432)

GEOL 433 Advanced Petrology (3 Units)

Prerequisite: GEOL 432. Petrogenesis of igneous, metamorphic and sedimentary rocks as determined by microscopic studies of textures and mineral assemblages using thin sections. Laboratory. (Formerly 3370:433)

GEOL 435 Petroleum Geology (3 Units)

Prerequisite: GEOL 350. Natural occurrences of petroleum. Characteristics, origin, entrapment and exploration methods. Laboratory, field trips. (Formerly 3370:435)

GEOL 436 Coal Geology (3 Units)

Prerequisites: GEOL 101 and GEOL 102. Origin, composition and occurrence of coal with emphasis on depositional environments, coalification processes, exploration, evaluation and exploitation. Laboratory, field trips. (Formerly 3370:436)

GEOL 437 Economic Geology (3 Units)

Prerequisites: GEOL 231 and GEOL 350. Study of metallic and nonmetallic mineral deposits emphasizing paragenesis and exploration. Laboratory, field trips. (Formerly 3370:437)

GEOL 441 Fundamentals of Geophysics (3 Units)

Prerequisites: MATH 223 or permission and PHYS 292. Fundamental concepts in solid earth geophysics, planetary physics, geodesy, and geomagnetism. Contributions of geophysics to recent major developments in geoscience. (Formerly 3370:441)

GEOL 443 Rivers (3 Units)

Prerequisite: Permission of department. Study of the geologic and environmental aspects of river systems and related human impacts. Includes mandatory, 0 credit weekend field work. (Formerly 3370:443)
Gen Ed: Complex Issues Facing Society

GEOL 444 Environmental Magnetism (3 Units)

Prerequisite: GEOL 101 or permission. Introduction to the theory and methods of environmental magnetism and the application of environmental magnetism to interpreting sedimentary deposits. (Formerly 3370:444)

GEOL 445 Environmental and Engineering Geophysics (3 Units)

Prerequisite: PHYS 261 or PHYS 291 or permission of instructor. Corequisite: PHYS 262 or PHYS 292 or permission of instructor. Basic subsurface exploration using ground penetrating radar and multi-channel electrical resistivity. Applications in environmental assessment, civil engineering and geotechnical engineering. Field trips. (Formerly 3370:445)

GEOL 446 Exploration Geophysics (3 Units)

Prerequisites: MATH 223 and PHYS 292. Basic principles and techniques of geophysical exploration with emphasis on gravimetric, magnetic, seismic and electrical methods and application to geological problems. Laboratory, field trips. (Formerly 3370:446)

GEOL 449 Borehole Geophysics (3 Units)

Basic principles and techniques of geophysical well logging with emphasis on electrical, radioactive, and sonic measures and their quantitative evaluation. Applications in oil, gas, and groundwater exploration. Laboratory. (Formerly 3370:449)

GEOL 450 Advanced Structural Geology (3 Units)

Prerequisite: GEOL 350. Fundamental and advanced concepts of structural geology with emphasis on current and developing concepts. Laboratory, field trips. (Formerly 3370:450)

GEOL 451 Field/Lab Studies in Environmental Science (3 Units)

Field/Laboratory inquiry into a specific interdisciplinary, environmental science topic. Students complete a research project involving collecting, analyzing and interpreting real world data. (May be repeated once.) (Formerly 3370:451)

GEOL 452 Geology and Environmental Science Service Learning (1-3 Units)

Prerequisite: Permission of instructor. Team service-learning project that involves collection, organization, analysis, and presentation of data. Field trips. (May be repeated for a maximum of four credits.) (Formerly 3370:452)

Gen Ed: Complex Issues Facing Society

GEOL 453 Geology Field Camp I (3 Units)

Prerequisites: GEOL 101, GEOL 102, GEOL 324 and permission of instructor. Introduction to collection and interpretation of field data and construction of geologic maps. Student will bear trip expenses. (Formerly 3370:453)

GEOL 454 Geology Field Camp II (3 Units)

Prerequisites: GEOL 231, GEOL 350, GEOL 453, and permission of instructor. Advanced techniques and methods of field geology necessary for detailed geological maps and interpretation. Student will bear trip expenses. (Formerly 3370:454)

GEOL 455 Field Studies in Geology (1-3 Units)

Field trip course emphasizing aspects of geology not readily studied in Ohio. Includes pre-trip preparation and post-trip examination. Student will bear trip expenses. (May be repeated for a total of four credits.) (Formerly 3370:455)

GEOL 462 Macroevolution (3 Units)

Prerequisites: GEOL 360 or BIOL 111. Provides a comprehensive treatment of macroevolutionary theory, focusing on evidence from the fossil record. Topics include genetics, speciation, development, and fossil lineages. Laboratory. (Formerly 3370:462)

GEOL 463 Environmental Micropaleontology (3 Units)

Prerequisite: GEOL 360. Introduction to techniques of micropaleontology as proxy indicators for environmental and climate change. Laboratory. Field trips. (Formerly 3370:463)

GEOL 465 Geomicrobiology (3 Units)

Prerequisites: CHEM 151 and CHEM 153. A course addressing the physiology, ecology, and activities of microorganisms that mediate important biogeochemical processes, and the interdisciplinary approaches to studying them. (Formerly 3370:465)

GEOL 470 Geochemistry (3 Units)

Prerequisites: GEOL 101, GEOL 230, CHEM 151, and CHEM 152. Application of chemical principles to the study of geologic processes. Laboratory, field trips. (Formerly 3370:470)

GEOL 472 Stable Isotope Geochemistry (3 Units)

Prerequisites: GEOL 101, GEOL 102, CHEM 151, CHEM 152, CHEM 153, and MATH 221. Application of stable isotope geochemistry to the study of hydrologic and carbon cycles, modern sedimentary environments, and the interpretation of sedimentary rocks. (Formerly 3370:472)

GEOL 474 Groundwater Hydrology (3 Units)

Prerequisite: GEOL 101 or [GEOL 104 and GEOL 211]. Origin, occurrence, regimen and utilization of groundwater. Qualitative and quantitative presentation of geological and geochemical aspects of groundwater hydrology. Laboratory, field trips. (Formerly 3370:474)

GEOL 480 Seminar in Environmental Studies (2 Units)

Discussion of specific environmental topic(s) from an interdisciplinary viewpoint; resource persons are drawn from the University and surrounding community. (Formerly 3370:480)

GEOL 481 Analytical Methods in Geology (2 Units)

Prerequisites: GEOL 230 and GEOL 231. A survey of analytical methods used to solve geologic problems with emphasis on method selection, proper sample collection, analysis of data quality and data presentation. (Formerly 3370:481)

GEOL 484 Geoscience Research & Consulting Methods (2 Units)

Prerequisite: Must be a Geology Department graduate student or senior major in Geology, or have permission of instructor. Methods for finding, gathering, managing, and evaluating geoscience information. Emphasis on finding data sources (including electronic), creating valid data sets, visualizing data. (Formerly 3370:484)

GEOL 485 Individual Readings in Geology and Environmental Science (1-3 Units)

Prerequisite: Permission of instructor. (May be repeated for a total of 4 credits) Independent study and directed readings on a selected topic to fit an individual student's program. (Formerly 3370:485)

GEOL 490 Workshop in Geology and Environmental Science (1-4 Units)

Group studies of special topics in geology and environmental science. May not be used to meet undergraduate major requirements in the Department. May be used for elective credit only. (May be repeated for up to 4 credits.) (Formerly 3370:490)

GEOL 491 Internship in Geology and Environmental Science (1-3 Units)

Prerequisite: Permission of Department Chair. Supervised professional experience in geology or environmental science. Only three credits may be applied toward a degree in geology. (May be repeated for a total of six credits.) (Formerly 3370:491)

GEOL 497 Honors Project in Geology (1-3 Units)

(May be repeated for a total of six credits.) Prerequisite: permission of department honors preceptor, Honors student only. Exploration of research topics and issues in geology. Selection of research topic and writing of research paper in proper scholarly form under direction of faculty member. (Formerly 3370:497)

GEOL 498 Special Topics in Geology (1-3 Units)

Prerequisite: Permission of instructor. Special lecture courses offered once or only occasionally in areas where no formal course exists. (Formerly 3370:498)

GEOL 499 Research Problems in Geology (1-3 Units)

(May be repeated for a total of four credits) Prerequisite: Permission. Independent research leading to the completion of a written paper or presentation at a professional meeting.