

GEOSCIENCES

The Department of Geosciences focuses primarily on research in topics such as hydrogeology, paleoclimate reconstruction, climate change, modern siliciclastic and carbonate sedimentology, geomorphology, and aqueous geochemistry and is a recognized leader in Earth science educational research. The department maintains excellent modern instrumentation for geologic and environmental research including an environmental scanning electron microscope, environmental magnetism laboratory, rock mechanics laboratory, and a full suite of instruments for aqueous geochemistry.

Visit the Department of Geosciences website (<https://www.uakron.edu/geology/>) to learn more about its faculty and facilities.

- Environmental Studies, Certificate (<https://bulletin.uakron.edu/graduate/colleges-programs/arts-sciences/geosciences/environmental-studies-certificate/>)
- Geology, MS (<https://bulletin.uakron.edu/graduate/colleges-programs/arts-sciences/geosciences/geology-ms/>)

Geology (GEOL)

GEOL 505 Archaeological Geology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Provides background in geologic principles and techniques relevant to archaeologists. Topics include stratigraphy, absolute dating, locality assessment, zooarchaeology, taphonomy, and remote sensing. Required lab, field trips. (Formerly 3370:505)

GEOL 507 Archaeogeophysical Survey (3 Units)

Prerequisite: admission to Geology Master's program or permission. 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 3370:507)

GEOL 510 Regional Geology of North America (3 Units)

Prerequisite: admission to Geology Master's program or permission. Examination of physiographic provinces of North America emphasizing structure, tectonic setting, stratigraphy and processes responsible for landforms in each province. Laboratory, field trips. (Formerly 3370:510)

GEOL 511 Glacial Geology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Causes and effects of Pleistocene expansion of polar ice masses with emphasis on glacial deposits and world climatic changes. Field trips. (Formerly 3370:511)

GEOL 521 Coastal Geology (3 Units)

Prerequisite: admission to Geology Master's program or permission. 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 3370:521)

GEOL 525 Principles of Sedimentary Basin Analysis (3 Units)

Prerequisite: admission to Geology Master's program or permission. Primarily the study of depositional systems, regional and global stratigraphic cycles, and sedimentation and plate tectonics. (Formerly 3370:525)

GEOL 532 Optical Mineralogy - Introductory Petrology (3 Units)

Prerequisite: Admission to Geology Master's program or permission. Optical techniques for identification, characterization, and classification of minerals and rocks using the petrography microscope. Laboratory. (Formerly 3370:532)

GEOL 533 Advanced Petrology (3 Units)

Prerequisite: GEOL 532. Petrogenesis of igneous, metamorphic and sedimentary rocks as determined by microscopic studies of textures and mineral assemblages using thin section. Laboratory. (Formerly 3370:533)

GEOL 535 Petroleum Geology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Natural occurrences of petroleum. Characteristics, origin, entrapment and exploration methods. Laboratory, field trips. (Formerly 3370:535)

GEOL 536 Coal Geology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Origin, composition and occurrence of coal with emphasis on depositional environments, coalification processes, exploration, evaluation and exploitation. Laboratory, field trips. (Formerly 3370:536)

GEOL 537 Economic Geology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Study of metallic and nonmetallic mineral deposits emphasizing paragenesis and exploration. Laboratory, field trips. (Formerly 3370:537)

GEOL 541 Fundamentals of Geophysics (3 Units)

Prerequisite: admission to Geology Master's program or permission. Fundamental concepts in solid earth geophysics, planetary physics, geodesy, and geomagnetism. Contributions of geophysics to recent major developments in geoscience. (Formerly 3370:541)

GEOL 543 Rivers (3 Units)

Prerequisites: 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 3370:543)

GEOL 544 Environmental Magnetism (3 Units)

Prerequisite: admission to Geology Master's program or permission. Introduction to the theory and methods of environmental magnetism and the application of environmental magnetism to interpreting sedimentary deposits. (Formerly 3370:544)

GEOL 545 Environmental and Engineering Geophysics (3 Units)

Advanced subsurface exploration using ground penetrating radar and multi-channel electrical resistivity. Applications in environmental assessment, civil engineering and geotechnical engineering. Field trips. (Formerly 3370:545)

GEOL 546 Exploration Geophysics (3 Units)

Prerequisite: admission to Geology Master's program or permission. 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 3370:546)

GEOL 550 Advanced Structural Geology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Fundamental and advanced concepts of structural geology with emphasis on current and developing concepts. Laboratory, field trips. (Formerly 3370:550)

GEOL 551 Field/Lab Studies in Environmental Science (3 Units)

Prerequisite: permission of instructor. 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 3370:551)

GEOL 552 Geology and Environmental Science Service Learning (1-3 Units)

Graduate students gain experience as project managers for class projects by designing research plans, supervising data collection, lab analyses and preparing final project reports. (Formerly 3370:552)

GEOL 553 Geology Field Camp I (3 Units)

Prerequisite: admission to Geology Master's program and permission of instructor. Introduction to collection and interpretation of field data and construction of geologic maps. (Formerly 3370:553)

GEOL 554 Geology Field Camp II (3 Units)

Prerequisite: admission to Geology Master's program and permission of instructor. Advanced techniques and methods of field geology necessary for interpreting detailed geological maps. (Formerly 3370:554)

GEOL 555 Field Studies in Geology (1-3 Units)

Prerequisite: Permission of instructor. 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 up to four credits.) (Formerly 3370:555)

GEOL 562 Macroevolution (3 Units)

Prerequisite: admission to Geology Master's program or permission. Provides a comprehensive treatment of macroevolutionary theory, focusing on evidence from the fossil record. Topics include genetics, speciation, development, and fossil lineages. Laboratory. (Formerly 3370:562)

GEOL 563 Environmental Micropaleontology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Introduction to techniques of micropaleontology evolution and paleoecology of selected microfossil groups. Laboratory, field trips. (Formerly 3370:563)

GEOL 565 Geomicrobiology (3 Units)

Prerequisite: Graduate standing. A course addressing the physiology, ecology, and activities of microorganisms that mediate important biogeochemical processes, and the interdisciplinary approaches to studying them. (Formerly 3370:565)

GEOL 570 Geochemistry (3 Units)

Prerequisite: admission to Geology Master's program or permission. Application of chemical principles to the study of geologic processes. Laboratory, field trips. (Formerly 3370:570)

GEOL 572 Stable Isotope Geochemistry (3 Units)

Prerequisite: admission to Geology Master's program or permission. Application of stable isotope geochemistry to the study of the hydrologic and carbon cycles, modern sedimentary environments, and the interpretation of sedimentary rocks. (Formerly 3370:572)

GEOL 574 Groundwater Hydrology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Origin, occurrence, regimen and utilization of groundwater. Qualitative and quantitative presentation of geological and geochemical aspects of groundwater hydrology. Laboratory, field trips. (Formerly 3370:574)

GEOL 580 Seminar in Environmental Studies (2 Units)

Prerequisite: Graduate status. Discussion of specific environmental topic(s) from an interdisciplinary viewpoint; resource persons are drawn from the University and surrounding community. (Formerly 3370:580)

GEOL 581 Analytical Methods in Geology (2 Units)

Prerequisite: admission to Geology Master's program or permission. 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 3370:581)

GEOL 584 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 3370:584)

GEOL 585 Individual Readings in Geology (1-4 Units)

Prerequisite: permission of graduate advisor required. (May be repeated for a total of 8 credits; credits may not be used to meet degree requirements.) Directed reading to fit individual student programs. Credit/Noncredit. (Formerly 3370:585)

GEOL 590 Workshop in Geology and Environmental Science (1-3 Units)

Group studies of special topics in geology and environmental science. May not be used to meet graduate degree requirements in the Department. May be used for elective credit only. (May be repeated.) (Formerly 3370:590)

GEOL 591 Graduate Internship in Geology and Environmental Science (1-3 Units)

Prerequisite: Permission of the Chair. Supervised professional experience in geology or geophysics. (May only apply three credits toward minimum graduate requirements in Geology and Environmental Science.) (Formerly 3370:591)

GEOL 631 Rocks & Minerals (4 Units)

Prerequisite: admission to Geology Master's program or permission. Intensive course integrating crystallography, mineralogy and petrology for the science teacher and graduate student from disciplines other than geology. Laboratory. (Formerly 3370:631)

GEOL 639 Nuclear Geology (3 Units)

(Two hour lecture, three hour laboratory) Prerequisites: minimum of seven credits in chemistry, eight credits in physics, eight credits in calculus and eight credits in geology or permission. Discusses nature of radioactive and stable isotopes, their applications in geology, radioactive minerals, radioactive background and disposal of radioactive wastes. Nuclear analytical techniques will also be discussed; lecture, laboratory and field study. (Formerly 3370:639)

GEOL 643 Geostatistics (3 Units)

Prerequisite: admission to Geology Master's program or permission. Application of statistical methods to geology and geophysics including tests of hypotheses, trend surface analysis, analysis of variance, nonparametric statistics and time series analysis. (Formerly 3370:643)

GEOL 655 Advanced Field Studies in Geology (1-3 Units)

Prerequisite: Permission of instructor. Field trip course studying aspects of geology not seen in Ohio; includes pre- and post-trip academic activities. Students will bear costs. (May be repeated for a total of four credits.) (Formerly 3370:655)

GEOL 656 Global Tectonics (3 Units)

Prerequisite: admission to Geology Master's program or permission. Theoretical study of physical forces involved in formation and deformation of earth's crust with emphasis on plate tectonics and associated diastrophic features. (Formerly 3370:656)

GEOL 661 Geologic Record of Past Global Change (3 Units)

Prerequisite: equivalent of baccalaureate degree in geology or permission of instructor. Study of the geologic record of past global climate and environmental change from geochemical, paleontological, sedimentological and other geological evidence. (Formerly 3370:661)

GEOL 674 Advanced Ground Water Hydrology (3 Units)

Prerequisite: admission to Geology Master's program or permission. Study of water table and artesian aquifers under steady and nonsteady state conditions. Collection and evaluation of field data with regard to theory. Water well and well field design. Laboratory and field work. (Formerly 3370:674)

GEOL 680 Seminar in Geology (2 Units)

(May be repeated for a total of six credits) Selected topics with reference material from original sources. (Formerly 3370:680)

GEOL 684 Selected Topics in Geology (1-3 Units)

(May be repeated for a total of eight credits) Prerequisite: permission. Topics not regularly offered as formal courses, generally of classic current importance. Entails lectures, readings, discussions and/or guided laboratory work. (Formerly 3370:684)

GEOL 685 Advanced Individual Readings in Geology (1-4 Units)

Prerequisite: Permission of graduate advisor. Directed readings to fit individual student programs. (May be repeated for a maximum of nine credits.) (Formerly 3370:685)

GEOL 688 Geology Teaching Practicum (2 Units)

Corequisite: graduate assistantship. Training and experience in college teaching of geology under supervision of experienced faculty. May be repeated for a maximum of 8 credits. Credits may not be used to meet degree requirements. Credit/Noncredit. (Formerly 3370:688)

GEOL 696 Geology Colloquium (1 Unit)

Lecture on current topics in geological sciences and thesis proposals and defenses by graduate students. May be repeated. Does not satisfy degree requirements. (Formerly 3370:696)

GEOL 698 Graduate Research Problems (1-3 Units)

(May be repeated for a total of six credits) Prerequisite: permission. Directed reading and research in an aspect of geology chosen by student in consultation with an instructor. (Formerly 3370:698)

GEOL 699 Master's Thesis (1-6 Units)

Independent and original investigation. Must be successfully completed, report written and defended before a committee. (Formerly 3370:699)