

GEOLOGY (GEOLOGY)

Courses

GEOLOGY 220 General Geology Credits: 3

Geology is the study of Earth, the materials that make up the Earth, and the forces and processes that build and shape the continents, oceans, and life on Earth. The goal of this course is for students to gain an understanding of the fundamental concepts and scientific principles that underlie the physical, chemical, and biological processes that shape our Earth and to learn to think critically about scientific information and how geologic processes affect us every day.

GEOLOGY 220 - MOTR GEOL 100: Geology



GEOLOGY 220L General Geology Laboratory Credits: 2

Laboratory and field investigations of principles of the geology designed to complement the topics covered in GEOLOGY 220 through the use of inquiry-based investigations in the laboratory and field.

GEOLOGY 220L - MOTR GEOL 100L: Geology with Lab



GEOLOGY 250L Field Methods in Earth and Environmental Science Credits: 3

A field-based course covering basic methods used by earth scientists for environmental, geographic, and geologic investigations. Students will collect field data at off-campus sites, conduct periodic monitoring, and analyze samples using departmental and personal instrumentation. Students will work on collaborative projects and will present their results. Class will meet weekly for four hours in the field.

GEOLOGY 250L - MOTR PHYS 110LES: Essent. Physical Sciences w/Lab



GEOLOGY 251L Field Methods in Earth and Environmental Science: Off-Campus Credits: 3

This course will provide students with an introductory, inquiry-based learning experience that focuses on the application of field methods for understanding surface and subsurface earth processes and environmental issues. Students will collect field data at off-campus sites, conduct periodic monitoring, and analyze samples using departmental Instrumentation. Students will work on collaborative projects and will present their results. Class will meet at an off campus location during break (added cost) plus have four on campus meetings.

GEOLOGY 313 Evolution and the Geologic Record Credits: 4

An introduction to the history of life by studying the geologic record. Students will examine major features of the fossil record including: invertebrates, vertebrates, and plants. Students explore what the fossil record tells us about geologic time, evolution, past environments and distributions of organisms. Three hours of lecture and two hours of laboratory a week. The course will include field trips to collect and interpret fossils and paleoenvironments.

GEOLOGY 314 Principles of Geomorphology Credits: 4

Explores the processes that shape the earth's surface. Focuses on the development and description of fluvial, glacial, eolian, and coastal landforms. Studies the influence of tectonic and climatic factors. Three hours lecture and two hours lab per week. Field trip.

Prerequisites: ENV-SCI 110R (or GEOLOGY 220).

GEOLOGY 321 Climate Change Impact Assessment and Policy Response Credits: 3

This course introduces how scientists assess observed climate change and predict future climate change. Lectures, discussions, problem sets, and term papers help students explore interactions among climate change, human activities and policy responses. It helps students achieve an appreciation for the role of accurate scientific information as foundation for shaping political agreements and policies on climate change.

Prerequisites: ENV-SCI 110R.

GEOLOGY 322 Earth Materials Credits: 4

Introduction to the formation, occurrence, and classification of minerals and igneous and metamorphic rocks. Three hours lecture and discussion with two hours laboratory a week.

Prerequisites: CHEM 212R, GEOLOGY 220 OR ENV-SCI 110.

GEOLOGY 325 Sedimentology/Stratigraphy Credits: 4

Study of sedimentary rocks with special emphasis given to hand specimen identification based on mineral composition and textural features. Characteristics of sediments, transportation and environment of sediment deposition. Principles of stratigraphy, facies analysis and interpretation. Measurement and description of stratified rocks. Three hours lecture and two hours lab per week. Field trips.

Prerequisites: GEOLOGY 220; or ENV-SCI 110R and ENV-SCI 110L.

GEOLOGY 326CZ Archaeology of Ancient Disasters Credits: 3

Remarkable human achievements are revealed by archaeological research, but the human past was frequently shaped as well by disasters of natural and human origin. Drawing on case studies that include data from the geosciences, archaeological excavations, and historical sources, this class examines how earth processes, the biosphere, and human cultural behavior were all sources of catastrophe. The study of ancient disasters not only gives us a wider understanding of human history, it may offer lessons for coping with future catastrophes.

GEOLOGY 335 Introduction to Waste Management Credits: 3

Overview of issues in waste management. Nature and classification of waste. Municipal solid waste: disposal methods, design, construction and maintenance of sanitary landfills. Nature and sources of hazardous waste, storage, transportation, treatment and disposal of hazardous waste. Types and sources of nuclear waste; disposal of high level and low level nuclear wastes. Sources, nature, handling and disposal of biologic waste. Pollution prevention, recycling and resource conservation.

Prerequisites: ENV-SCI 110R, GEOG 150, GEOLOGY 220.

GEOLOGY 350 Earth Structures and Tectonics Credits: 4

This course is designed to teach students the basic techniques and approaches for problem solving in structural geology. The course will cover the fundamentals of crustal deformation and discuss joints, faulted and folded rocks in their plate tectonic context. Two hours of lectures and three hours of laboratory a week. Course will include local field trips and one weekend field trip.

Prerequisites: GEOLOGY 220, PHYSICS 210 (or PHYSICS 240).

GEOLOGY 370R Hydrogeology Credits: 3

Geology and hydrologic factors controlling the occurrence, movement, quality, recovery and development of water supply and distribution. Problems relating to urbanization of flood plains.

GEOLOGY 398 Geology Midcontinent Field Trip Credit: 1

A study of a selected area of the midcontinent U.S. with emphasis on locations to be visited during a three-day field trip (at the student's expense). An opportunity to observe and study physical features and collect materials. Several scheduled one-hour meetings in addition to field trip. Lectures, discussion and reading assignments provide a background to place the area covered by the field trip into the overall geologic framework of the Midcontinent U.S. Descriptive report or written examination. Limited enrollment.

Prerequisites: Junior or senior level.

GEOLOGY 411 Mineral Deposits Credits: 3

Distribution, origin and environmental implications of extractable resources including non-metallic deposits, ores, and selected energy resources.

GEOLOGY 416 Understanding and Living with Volcanoes Credits: 3

This course will examine the distribution, tectonic setting, and morphology of a range of volcano types on Earth and a few examples from other planets. Students will study volcanic processes including explosive and passive processes and how we investigate them. This will involve discussion of volcanic hazards and hazard assessment, risk communication, and the challenges of volcanic crises response. The course will also cover how volcanoes impact the local and global economy and Earth's climate. Recommended preparation: GEOG 314 / GEOLOGY 314 or GEOLOGY 325 or GEOLOGY 342.

Prerequisites: GEOLOGY 220 or ENV-SCI 110R/110L, and GEOG 203 or GEOG 402.

GEOLOGY 434 Hazardous Waste Operations Management Credits: 2

Overview of federal regulations dealing with hazardous waste management, toxicology, hazard communication, site management, air monitoring, operating procedures, and health and safety. The course includes hands-on training on spill control, equipment use and emergency response. Practical training involves physical stress and participants must be in good physical health. This course satisfies OSHA's 40 hour training requirement for hazardous waste personnel.

GEOLOGY 441 Environmental Geophysics Credits: 3

Fundamental theory and near-surface applications of the geophysical methods; (1) seismic refraction, (2) seismic reflection, (3) gravity, and (4) magnetics. Emphasis will be placed on the use of these methods in environmental and engineering investigations, addressing such issues as water resources, contaminant transport, geotechnical properties and archaeological protection. Course will include a field component illustrating application of selected techniques to local environmental problem.

GEOLOGY 446 Petroleum Geology Credits: 3

Study of the origin, concentration, exploration for and recovery of petroleum.

Prerequisites: GEOLOGY 220.

GEOLOGY 456 Field Methods in 3D Imaging of the Environment Credits: 3

This course is designed to teach students techniques to create high-resolution, 3D images of the environment and detailed topographic maps using digital technologies. The class will include instruction on various aerial systems and hand-held photography and the software required for data acquisition, processing, and interpretation.

GEOLOGY 460 Introduction to Geochemistry Credits: 3

Basic principles governing the origin, distribution and migration of the elements and the geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere.

Prerequisites: CHEM 212R, GEOLOGY 312.

GEOLOGY 471 Tectonics Credits: 3

A detailed inquiry into plate tectonics and the geophysical and geological data that define the motion of lithospheric plates. Global examples of divergent, convergent, and transform plate boundaries will be studied through lectures, discussions, problem sets, and term papers.

Prerequisites: GEOLOGY 325, GEOLOGY 350.

GEOLOGY 472 Earthquake Geology Credits: 3

A detailed inquiry into the study of present and past earthquakes as they are preserved in the seismological, geophysical, and geologic record. Global examples of earthquakes will be studied through lectures, discussions, problem sets, term papers, field trips and field projects.

GEOLOGY 490 Geology Field Camp Credits: 6

Study and practical involvement in the methods of geological mapping. The six-week course is conducted during the summer, partially in a field camp away from the Kansas City area. Students pay their own travel expenses to and from the field. Participation in the course involves individual mapping in the field area and field reports.

GEOLOGY 498 Undergraduate Field Research Credits: 1-5

The student will collaborate with fellow students and instructors in collection of original field geologic data at a location remote from campus. Field research will be carried out during semester intersessions or summer semesters.

GEOLOGY 499WI Geology Seminar Credits: 3

Students participate in discussions; present formal talks; and prepare written papers on selected topics.

Prerequisites: Senior standing.