GEOLOGY (GEOLOGY)

Courses

GEOLOGY 5507 Archeological Resources Management Credits: 3
This class examines contemporary issues managing archaeological resources. This class is intended for students seeking work in Cultural Resources Management (CRM); those already working CRM, or student anthropology, environmental studies, geology, geography, public administration and other fields likely to deal with archaeological and historical research or employment setting. This class does not require a background in archaeology.

GEOLOGY 5508 Archaeological Field Survey Methods Credits: 3
this class offers instruction in the basic skills required to conduct field surveys in archaeology and other geosciences disciplines. In the classroom, students learn about the development of archaeology as a scientific discipline and how to recognize some of the basic field data sought by archeologists. Students learn about mapping and land navigation techniques. The field phase of instruction includes visits to archaeological sites in the region.

GEOLOGY 5509 Field Study in Archaeology Credits: 1-5
This class offers students an opportunity to attend a field school in archaeology. Students will be taught how to: design archaeological research, set-up excavation, keep a wide range of excavation records, make maps and drawings, take photographs related to excavation problems, identify and recover a broad spectrum of artifact and faunal remains, collect samples for specialized analyses and use a wide range of excavation tools. This course will also introduce students to recording and analyzing excavated materials in the archaeological laboratory.

GEOLOGY 5512 Geology and Hazardous Waste Management Credits: 3
Nature, sources and characterization of hazardous waste; collection, transportation and disposal of hazardous wastes. Fundamentals of toxicology and risk assessment. Application of geologic principles and methods in the assessments and remediation of abandoned hazardous waste sites and contaminated aquifers. Review of selected case histories. Experts from government and private organizations will be invited to deliver guest lectures. An out-of-town field trip to a hazardous waste site is required. A term paper based on library research or an approved experimental project is required for graduate credit.
Prerequisites: GEOLOGY 325, GEOLOGY 342, GEOLOGY 350.

GEOLOGY 5513 Advanced Mineral Deposits Credits: 3
Distribution, origin and environmental implications of extractable resources including non-metallic deposits, ores, and selected energy resources.
Prerequisites: GEOLOGY 312, GEOLOGY 325, graduate standing.

GEOLOGY 5516 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.

GEOLOGY 5521 Advanced Methods for Earth and Environmental Science Credits: 3
This course will provide students with an 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 site, conduct periodic monitoring, and analyze samples using departmental instrumentation.
Prerequisites: GEOLOGY 220 (or ENV-SCI 110R), GEOLOGY 220L (or ENV-SCI 110L).

GEOLOGY 5525 Quaternary Geology Credits: 3
The study of Quaternary processes, surficial deposits, and land forms. Course content will cover both the glaciated and nonglaciated portions of the United States as well as the interrelations between Quaternary geology and urbanization. Three hour lecture. Field trips.
Prerequisites: GEOLOGY 314, baccalaureate degree in geology.

GEOLOGY 5531 X-Ray Diffraction and Fluorescence Methods: X-Ray Mthds Geol/Anly Credits: 2
Theory and practical application of x-ray diffraction and fluorescence methods in characterizing geologic materials. Two hours lecture and one 2-hour lab per week for 8 weeks.

GEOLOGY 5532 Icpms Applications in Geology Credits: 2
Theory and practical application of Inductively-Coupled Plasma Mass Spectrometry in the geosciences and environmental sciences. Two hours lecture and discussion, and one 2-hour lab per week for 8 weeks.

GEOLOGY 5534 Hazardous Waste Operation 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 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 5535 Aqueous Geochemistry Credits: 3
This course is directed to two objectives. First it will equip the students with a basic understanding of the geochemical principles and calculations which are directly related to environmental problems and second, it will provide the student with a basic understanding of specific problem areas in environmental geochemistry.
Prerequisites: CHEM 211, CHEM 212R, Baccalaureate degree in geology.

GEOLOGY 5536 Introduction to Scanning Electron Microscopy Methods Credits: 2
Practical introduction to the use of the scanning electron microscope and its accessories, including image production, elemental analysis, and elemental mapping of solid materials. Geological applications will be emphasized, but the methods presented will be useful for microscopic examination of solid materials in any discipline. 2 hours of lecture and lab per week for 8 weeks.
Prerequisites: Permission of the instructor.

GEOLOGY 5541 Environmental Geophysics Credits: 3
Fundamental theory and near-surface applications of the geophysical methods including seismic methods, potential methods, and electrical methods. 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 a local environmental problem.
Prerequisites: Baccalaureate degree in Geology.

GEOLOGY 5542 Electrical Methods in Environmental Geophysics Credits: 3
Fundamental theory and near-surface applications of the electrical geophysical methods; (1) electrical resistivity, (2) electromagnetics, (3) ground penetrating radar, and (4) induced polarization. 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 a local environmental problem.
Prerequisites: Baccalaureate degree in Geology.

GEOLOGY 5546 Petroleum Geology Credits: 3
This course addresses the geological habitat of oil and natural gas, the impacts of petroleum on society, subsurface mapping techniques, and the acquisition and interpretation of subsurface and production data.
Prerequisites: GEOLOGY 220, baccalaureate degree in geology.

GEOLOGY 5551 Geotechnics Credits: 4
Integration of the basic principles and concepts from material sciences, rock and soil mechanics, and civil engineering. Mechanical properties, geologic aspects and engineering classifications of earth materials and the effects of physical forces on their engineering behavior will be emphasized. Three hours of lecture and two hours of laboratory each week. Field trips.
Prerequisites: PHYSICS 210, PHYSICS 220, GEOLOGY 350.

GEOLOGY 5555 Environmental Impact Analysis Credits: 3
A systematic analysis of the spectrum of environmental changes related to human use and occupancy in urban settings. Study of the nature of activities such as industrialization, mining, urbanization and transportation, and their effect on the specific site and general region. Methods of measuring aesthetic and economic quality of the urban areas will be explored in an attempt to facilitate writing environmental impact statements.
Prerequisites: Baccalaureate degree in geology.

GEOLOGY 5559 Inquiry-Based Field Studies for Teachers Credits: 3-6
Inquiry-based studies in environmental science, environmental chemistry and geology involving collaborations between course participants, practicing scientists and professional educators. The course is designed especially for pre- and in-service teachers of all levels and contact areas to enhance critical thinking, problem solving and process skills as defined by state and national standards. Projects will balance field and lab studies with analysis and presentation of results through electronic, oral and written means.

GEOLOGY 5561 Geologic Mapping Credits: 3
Analysis of the stratigraphic section in the greater Kansas City area by field investigation. Compilation of descriptive data and the construction of detailed geologic maps. Practical problems to determine the most beneficial use of the land in an area that is rapidly becoming urbanized. Previous field mapping experience highly recommended.
Prerequisites: Baccalaureate degree in geology.

GEOLOGY 5566 Field Methods in 3D Imaging of the Environment Credits: 3
This course is designed to teach students techniques for creating 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 5570 Advanced Hydrogeology Credits: 3
This course will focus on advanced groundwater hydrology with emphasis on flow equations and computational modeling in various geologic settings. Students will be introduced to basic analytical skills to derive dynamics of groundwater flow, comprehensive understanding of aquifer characteristics, and interpretation of field based groundwater data using computational simulations.
Prerequisites: Baccalaureate degree in Geosciences, GEOL 370R, or permission of instructor.

GEOLOGY 5571 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 5572 Earthquake Geology Credits: 3
This course is detailed inquiry into the study of present and past earthquakes as they are preserved in the seismological, geophysical, and geological record. Global examples of earthquakes will be studied through lectures, discussions, problem sets,term papers, field trips and field projects.
Prerequisites: GEOLOGY 350.

GEOLOGY 5597 Graduate Seminar in Geosciences Credits: 3
This graduate seminar examines emerging and current issues in Environmental and Urban Geosciences. Most environmental issues and their solutions are inherently multidisciplinary and are characterized by significant interactions between oceans, atmosphere, land, and society. In addition to examining these issues, this seminar engages students in the process of critically evaluating Earth and human systems studies. The course provides students with a fundamental background of today's important environmental challenges and experience doing the craft of science through critically reading, thinking, writing, and speaking.

GEOLOGY 5598 Special Topics in Urban Environmental Geology Credits: 1-3
Individual research into practical geoscience problems in the urban environment. Provides opportunity for individual research in applied geology. Topic and method to be established by student and academic supervisor prior to enrollment.

GEOLOGY 5598A Special Topics In Urban Environmental Geology: Petroleum Geology Credits: 1-3

GEOLOGY 5598B Spec Topics In Urban Environmental Geology: Soil/Rock Mechanics Credits: 1-3

GEOLOGY 5598C Sp Topics In Urban Environmental Geol: Stratigraphy/Paleontology Credits: 1-3

GEOLOGY 5598D Spec Topics In Urban Environmental Geology-Environmental Geology Credits: 1-3

GEOLOGY 5598E Special Topics in Energy and Mineral Resources Credits: 1-3
This course provides students an opportunity for advanced independent research in energy and mineral resources.

GEOLOGY 5598H Special Topics in Urban Environmental Geology - Geochemistry and Mineralogy Credits: 1-3
Special Topics In Urban Environmental Geology - Geochemistry and Mineralogy

GEOLOGY 5598I Special Topics In Urban Environmental Geology Credits: 1-3

GEOLOGY 5598J Special Topics In Urban Environmental Geology: Environmental Sci Credits: 1-3

GEOLOGY 5598K Issues in Waste Management Credit: 1
This course focuses on the critical problems of managing the waste materials generated in our society. The course includes discussion of various types of waste-municipal solid waste, hazardous (industrial) waste, nuclear and medical wastes. Sources, handling, storage, transportation, treatment and disposal of these wastes are reviewed. Experts from government and the waste management industry give guest lectures.

GEOLOGY 5598M Special Topics in Geostatistics and Modeling Credits: 1-3
Advanced independent research in geostatistics and modeling techniques.

GEOLOGY 5599 Research and Thesis: Geology Credits: 1-9
Individual directed research by the student leading to the preparation of a formal written thesis and oral defense.

GEOLOGY 5690 Special Research Topics Credits: 1-3
Student will produce a major research paper suitable for publication under the direction of their instructor.

GEOLOGY 5699R Research And Dissertation Credits: 1-10
Research for dissertation in partial fulfillment of the Geosciences requirements for the Ph.D. degree.

GEOLOGY 5899 Required Graduate Enrollment Credit: 1