

# GEOSCIENCES (GEOS)

## GEOS 100 | Earth in Perspective | 3 cr

Surveys the physical environment, including Earth's place in space, atmospheric processes, the oceans, and the solid earth; humanity's place in the system. Three-hour lecture.

**Prerequisites:** None.

**Offered:** Fall, Summer.

**Meets:** Natural Science: GEOS

## GEOS 101 | Introductory Geology | 3 cr

Explores the origin, age, and structure of the Earth; mountain building, volcanism, and continental drift; earth materials; rocks, minerals, and mineral and fossil fuel resources. Three-hour lecture.

**Prerequisites:** None.

**Offered:** Fall.

**Meets:** Natural Science: GEOS

## GEOS 102 | Origin and History of the Earth | 3 cr

Investigates the origin of the solar system and Earth; age of the Earth; origin of the oceans, atmosphere and life; geologic and life history. May require field trips.

**Prerequisites:** A 3 credit college-level geosciences course.

**Offered:** Spring.

## GEOS 104 | Introductory Geology Laboratory | 2 cr

Explores rock, mineral, and fossil identification; topographic and geologic map interpretation; aerial photographs; and hydrology, soils, and environmental geology. Six-hour lab. Requires fees.

**Prerequisites:** GEOS 101 or equivalent.

**Offered:** Spring.

## GEOS 105 | Oceanography | 3 cr

Explains the origin of ocean basins; nature of seawater; ocean circulation; waves and tides; life in the sea and marine resources. Intended for non-majors.

**Prerequisites:** None.

**Offered:** Summer, Winterim.

**Meets:** Natural Science: GEOS

## GEOS 106 | Great Lakes Water Resources | 3 cr

Physical and geologic history and description of Great Lakes region. Emphasis on hydrologic cycle, economic resources of the Great Lakes, pollution and other environmental issues. Three-hour lecture.

**Prerequisites:** None.

**Offered:** Spring.

**Meets:** Natural Science: GEOS

## GEOS 107 | Geology of National Parklands | 3 cr

Introduces fundamentals of geology as they relate to national parklands, including geological setting, geological features, and significance of designation.

**Prerequisites:** None.

**Offered:** Fall, Spring, Summer, Winterim.

**Meets:** Natural Science: GEOS

## GEOS 200 | Minerals and Rocks | 4 cr

Explores internal order of crystals; physical, chemical, and optical properties of minerals; mineral identification; mineral associations and the classification of igneous, metamorphic, and sedimentary rocks; and ore deposits. Requires field trips and lab fee. Three-hour lecture, three-hour lab.

**Prerequisites:** GEOS 104.

**Offered:** Fall.

## GEOS 301 | Geomorphology | 4 cr

Covers analysis and description of landforms. Emphasizes genesis, surficial processes, and relation to geologic structure. Includes regional treatment of landscapes. Requires field trips. Three-hour lecture; three-hour lab. Community-based learning designation.

**Prerequisites:** GEOS 102, GEOS 200; or consent of instructor.

**Offered:** Fall (even years).

**Meets:** Community Based Learning

## GEOS 309 | Paleontology | 3 cr

Applies principles, practices, and procedures to important fossil invertebrate groups; generalized discussion of plants and vertebrates; elements of biostratigraphy; paleoenvironmental interpretations. Field trips. Two-hour lecture; two-hour lab. Cross-listed with: BIOS 329.

**Prerequisites:** GEOS 102 or BIOS 102.

**Offered:** Spring.

## GEOS 320 | Soils, Weathering and Surficial Processes | 4 cr

Describes soils as natural entities in a process-based context. Covers methods and terminology of soil description and classification. Digs into environmental capacity of soils on a quantitative basis. Three-hour lecture; three-hour lab.

**Prerequisites:** GEOS 104; CHEM 101, CHEM 103.

**Offered:** Occasionally.

## GEOS 330 | Environmental Geology | 4 cr

Addresses application of basic geologic concepts to environmental problems. Emphasizes geologic hazards, waste disposal, urban planning, resource policy issues, and environmental trends and programs. Three-hour lecture; three-hour lab.

**Prerequisites:** GEOS 104 or consent of instructor.

**Offered:** Spring.

## GEOS 331 | Introduction to Geochemistry | 3 cr

Investigates chemical principles and their application to various geologic environments, chemical weathering, geochemical prospecting, phase equilibria, and geochronology. Requires field trip.

**Prerequisites:** CHEM 102, CHEM 104.

**Offered:** Spring (odd years).

## GEOS 345 | Geophysics | 3 cr

Surface and subsurface geophysics; principles and procedures of magnetics, gravity, seismology, electromagnetics, ground penetrating radar; applications in hydrogeology, petroleum and mineral exploration, environmental and water resource investigations. Field trips. Three-hour lecture.

**Prerequisites:** GEOS 102, MATH 114 or consent of instructor.

**Offered:** Spring (odd years).

## GEOS 355 | Stratigraphy and Sedimentation | 4 cr

Explores the sedimentary rock record, correlation, nomenclature, paleotectonics, subsurface techniques, sedimentary processes and environments, and recent sediments. Three-hour lecture; three-hour lab.

**Prerequisites:** GEOS 104, GEOS 200 or consent of instructor.

**Offered:** Spring.

## GEOS 361 | Hydrogeology | 3 cr

Examines surface water hydrogeology; runoff and stream flow; groundwater hydrogeology: distribution of ground water, aquifer properties, local and regional ground water flow, geology of ground water occurrence; aqueous chemistry, and water quality. Three-hour lecture.

**Prerequisites:** GEOS 200; MATH 114 or MATH 112 and MATH 113; or consent of instructor.

**Offered:** Spring (even years).

**GEOS 420 | Glacial Geology | 4 cr**

Explores regimen and flow of glaciers, glacial erosion and deposition; glacial landforms; Pleistocene history in glaciated and non-glaciated regions; and stratigraphy and chronology of Pleistocene deposits in the Midwest and Great Lakes. Requires field trips. Three-hour lecture; three-hour lab.

**Prerequisites:** GEOS 104, GEOS 200; or consent of instructor.

**Offered:** Spring (even years).

**GEOS 431 | Aqueous and Contaminant Geochemistry | 4 cr**

Examines solution chemistry, aqueous chemical speciation, organic chemistry, contaminant-sediment interaction, and contaminant fate and transport. Requires field trips. Three-hour lecture; three-hour lab.

**Prerequisites:** GEOS 331.

**Offered:** Spring (odd years).

**GEOS 445 | Environmental Sampling, Monitoring, and Assessment | 4 cr**

Covers EPA-referenced field and laboratory methods for evaluating contaminant levels in terrestrial and groundwater systems. Provides opportunity to practice sampling and monitoring techniques and gain experience with chromatographic and spectroscopic techniques. Three-hour lecture; three-hour lab. Requires lab fee.

**Prerequisites:** GEOS 330.

**Offered:** Fall.

**GEOS 465 | Applied Hydrogeology | 4 cr**

Mass transport in vadose and saturated zones; origin and behavior of inorganic and organic contaminants; investigative techniques; groundwater models; site remediation; groundwater resource development and management; water law. Three-hour lecture, three-hour lab. Field trips. Lab fee.

**Prerequisites:** GEOS 361.

**Offered:** Fall (even years).

**GEOS 470 | Remediation Science and Technology | 3 cr**

Investigates methods and techniques for reducing, removing or immobilizing metals and radionuclides. Three-hour lecture.

**Prerequisites:** GEOS 331, 361.

**Offered:** Spring (even years).

**GEOS 490 | Special Topics in Geosciences | 1-4 cr**

Intensive treatment of specialized areas in geology.

**Prerequisites:** Consent of instructor.

**Offered:** Occasionally.

**GEOS 495 | Senior Seminar | 1 cr**

Individual student preparations and detailed oral and written presentations, in professional-style format, on knowledge of specialized topics acquired through library, laboratory, and/or field research.

**Prerequisites:** GEOS 355 and senior standing.

**Offered:** Spring.

**GEOS 496 | Geoscience Applications | 3 cr**

Course in which students apply their knowledge in service to the community. Project may involve teamwork on environmental assessment, land-use planning, etc., or individual internships with corporate or governmental agencies. Culminates in report/recommendation based on investigations.

**Prerequisites:** GEOS 355 and senior standing; or consent of instructor.

**Offered:** Fall.

**GEOS 497 | Senior Thesis | 1-2 cr**

Familiarization with the processes of research and scientific writing based upon laboratory, field, and literature study; oral defense of the thesis. May repeat for up to 4 credits.

**Prerequisites:** Senior standing and consent of instructor.

**Offered:** Fall, Spring.

**GEOS 499 | Independent Study | 1-3 cr**

Allows students to pursue independent field, laboratory, or library research interest under supervision of faculty members. May be repeated with different topic for a maximum of 6 credits.

**Prerequisites:** Consent of instructor and department chair.

**Offered:** Fall, Spring.