GEOSCIENCE (GEOS)

GEOS 110 CAREERS IN SCIENCE1 Credit
Introduction for Physical Sciences majors to career options. Students will conduct independent research of selected firms or agencies. A required field trip to a major metropolitan area will provide knowledge opportunities and challenges of the technical job market.

GEOS 129 PHYSICAL SCIENCE FOR ELEMENTARY AND MIDDLE GRADES TEACHER3 Credits
A laboratory oriented course intended to strengthen the physical science background of the elementary and middle grades teacher.

GEOS 130 EARTH SCIENCE3 Credits
Introductory survey of the four earth sciences; geology, oceanography, meteorology, and astronomy. Designed to help non-scientists gain a greater appreciation of the global physical environment, and to understand interactions of society with that environment. One or more field trips may be required.
Notes: Credit cannot be applied toward an earth science subject endorsement, physical science major, or any geoscience minor.

GEOS 132 NATURAL HAZARDS AND DISASTERS3 Credits
The cause and effects of natural disasters can be understood using an Earth system science approach. Science and technology are limited in their ability to predict disasters. Recognizing these limitations, students will explore the roles of individuals in broader societal issues relating to disaster preparedness, damage and cost mitigation as they relate to natural hazards.

GEOS 135 PHYSICAL SCIENCE3 Credits
An integrated course in physical sciences including astronomy, earth science, geology, physics and chemistry.

GEOS 137 ENVIRONMENTAL GEOLOGY3 Credits
Considers effects of human interaction with the physical environment, both in terms of natural phenomena such as earthquakes and floods, which effect human lives, and resource use, in which humans change their environment. One or more field trips will be required.

GEOS 138 ASTRONOMY2 Credits
A descriptive study of the solar system, stars, and galactic systems, including theories of the origin of the universe and the solar system.
Co-requisites: GEOS 138L

GEOS 138L ASTRONOMY LABORATORY1 Credit
Laboratory experience in astronomy. Held in the evening either outdoors or in the planetarium.
Co-requisites: GEOS 138

GEOS 200 INDEPENDENT STUDY OR RESEARCH1-3 Credits
Study or research in an area of special interest.
Add Consent: Department Consent
Notes: The number of credit hours is determined by the topic and the amount of work required.
Requirements: Approval of instructor, School Dean, and Academic Vice President.

GEOS 210 PLANETARY GEOLOGY3 Credits
Planetary Geology consists of three, (one) hour lectures per week. The course provides a process oriented examination of the geological features associated with the planets of the Solar System, their satellites, and the Sun. and an examination of "Earth-like" planets and moons.

GEOS 231 PHYSICAL GEOLOGY3 Credits
Introduction to the fundamentals and language of physical geology, to aid in understanding the solid Earth, its origin, constituents, and surficial features, and the appreciation of the dynamic nature of our planet.
Co-requisites: GEOS 231L

GEOS 231L PHYSICAL GEOLOGY LABORATORY1 Credit
Laboratory exercises will introduce the tools geologists use to interpret Earth processes: minerals and rocks, maps, and aerial photographs. One or more field trips will be offered.
Co-requisites: GEOS 231

GEOS 234 EARTH SYSTEM HISTORY3 Credits
Highlights changes through time in the Earth system, including the solid Earth, the oceans and water on land, evolution of the atmosphere, and evolution of life as seen through the fossil record. The systems approach seeks out and analyzes interactions between these different components.
Co-requisites: GEOS 234L

GEOS 234L EARTH SYSTEM HISTORY LABORATORY1 Credit
Laboratory exercises will introduce the tools used to understand changes in the Earth system through time. Includes identification of the major fossil groups, and analysis of geologic, oceanographic, atmospheric and paleontologic data.
Co-requisites: GEOS 234

GEOS 245 FIELD SAMPLING TECHNIQUES3 Credits
Practical field skills applicable to geological and environmental studies developed through field exercises in the Pine Ridge Region or the home region of the student. Results presented in both oral and written formats. Students will learn to convey their knowledge to a variety of audiences, including professional colleagues, government agencies, and the general public.
Prerequisites: GEOS 137 or GEOS 234, GEOS 234L and GEOS 231, GEOS 231L
Co-requisites: GEOS 245L

GEOS 245L FIELD SAMPLING TECHNIQUES LABORATORY1 Credit
During the laboratory, the practical field skills discussed in Field Sampling Techniques lecture will be applied to field exercises in the Pine Ridge Region or the home region of the student.
Co-requisites: GEOS 245

GEOS 246 GEOLOGY FIELD CAMP I3 Credits
The online part of this course introduces workplace health, safety, environmental impacts and regulations, professionalism and ethics, and quality assurance/quality control in data collection. The field portion will build observation and interpretation skills and introduce technical aspects of field mapping, stratigraphic interpretation and structural analysis. Students will prepare field notes, maps, stratigraphic charts, cross sections, and reports while interacting with geological problems in the Great Plains and Rocky Mountains.
Prerequisites: GEOS 231, GEOS 231L, GEOS 234, GEOS 234L
Notes: Taught concurrently with GEOS 346.
Requirements: Additional course fee required.

GEOS 270 TOPICS IN GEOSCIENCE1-3 Credits
Special topics appropriate for lower division credit.
Notes: May be repeated with different emphases for up to six hours of credit.

GEOS 310 CAPSTONE I: RESEARCH SEMINAR1 Credit
The student will choose a topic for research and conduct a literature survey of that topic. Preliminary results and a plan for conducting further independent research on the topic will be presented in oral and written form during the semester.
Prerequisites: Sophomore or above status
Notes: Normally taken during the student's Junior year.

GEOS 312 PLANETARY GEOLOGY FOR EDUCATORS3 Credits
This course will provide an overview of planetary geology, which will include a discussion on the Solar System, our understanding of the physical compositions of other planetary bodies, a look at the Earth and its unique atmosphere, the atmospheres of other planets in our system, and small bodies present in the Solar System. Students will learn about the geological techniques employed to learn about other planets and moons as well as the technology used to investigate space.
Co-requisites: GEOS 312L

GEOS 312L PLANETARY GEOLOGY FOR EDUCATORS LABORATORY1 Credit
This course will provide an overview of planetary geology, which will include a discussion on the Solar System, our understanding of the physical compositions of other planetary bodies, a look at the Earth and its unique atmosphere, the atmospheres of other planets in our system, and small bodies present in the Solar System. Students will learn about the geological techniques employed to learn about other planets and moons as well as the technology used to investigate space.
Co-requisites: GEOS 312

GEOS 320 SUPERVISED STUDY IN LAB AND FIELD METHODS1-2 Credits
Students will prepare, supervise, and evaluate laboratory and field exercises under the direction of faculty members. Designed to give students practical experience teaching in the laboratory and field setting.
Cross-Listed: BIOL/CHEM/GEOS/PHYS320
Prerequisites: Sophomore or above status

GEOS 321 INTRODUCTION TO GPS1 Credit
Principles and applications of global positioning system. Emphasis is on mapping and other uses applied to geoscience field problems. Field trips may be required.
Prerequisites: Sophomore or above status

GEOS 322 INTRODUCTION TO GIS3 Credits
Principles and applications of geographic information systems with emphasis on Arcview* software. Students will address solutions to real-world problems using Geographic Information Systems.
Prerequisites: Sophomore or above status
Notes: Field trips my be required; recommended prerequisite: GEOS 321. * Registered Trademark

GEOS 325 ENERGY AND THE ENVIRONMENT3 Credits
A deep survey of the science and technology behind fossil fuels, nuclear, and
renewable energy sources. Participants will research the origins of energy resources and the technologies that put them to use. The class will develop a code of energy ethics.
Prerequisites: Junior status and permission of instructor
Add Consent: Instructor Consent
Notes: Students will produce a personal project documenting achievement of Essential Studies outcome 9. If that outcome is already satisfied, students may petition to get credit for Essential Studies outcome 6.

GEOS 334 METEOROLOGY3 Credits
The physical behavior of the atmosphere including the causes of weather and the elements of forecasting.
Prerequisites: Sophomore or above status

GEOS 337 PALEONTOLOGY3 Credits
A systematic survey of invertebrate phyla and vertebrate classes most important in the fossil record.

GEOS 337L PALEONTOLOGY LABORATORY1 Credit
Examination of fossil invertebrates and vertebrates in laboratory and field.
Prerequisites: Sophomore or above status
Co-requisites: GEOS 337

GEOS 338 ROCKS AND MINERALS3 Credits
Introduction to mineralogy, and optical mineralogy in the context of rocks and interpretation of rock-forming environments. Possibly one or more field trips required.
Prerequisites: GEOS 231, GEOS 231L, CHEM 132 and CHEM 132L or CHEM 140 and CHEM 140L, and Sophomore or above status

GEOS 346 GEOLOGY FIELD CAMP II3 Credits
The online part of this course teaches mineral and energy exploration, and measuring quantity and quality of resources. The field portion will build observation and interpretation skills and reinforce technical aspects of field mapping, stratigraphic interpretation and structural analysis. Student will prepare field notes, maps, stratigraphic charts, cross sections, and reports while interacting with geological problems in the Great Plains and Rocky Mountains.
Prerequisites: GEOS 246 or GEOS 245 and GEOS 245L
Requirements: Additional course fee required.

GEOS 390 INTERNSHIP IN GEOSCIENCE1-12 Credits
Provides practical experience as a geoscientist in government, business, or industry. Open to upper division students majoring in the area of geoscience.
Add Consent: Department Consent
Notes: Interested students should contact the Internship and Career Services Office to secure application materials.
Requirements: Application should be made prior to the semester the internship will be started; the amount of credit will be based on the availability of a suitable work position, the qualifications of the applicant, and the work hours.

GEOS 400 INDEPENDENT STUDY OR RESEARCH1-3 Credits
Study or research in a geoscience area of special interest.
Add Consent: Instructor Consent
Notes: The number of credit hours is determined by the topic and the amount of work required. Permission of instructor, School Dean, and Academic Vice President is required.

GEOS 401 CAPSTONE II: SENIOR RESEARCH1 Credit
Independent research projects based on the results presented in GEOS 310. Data collection, analysis, and presentation of scientific papers.
Prerequisites: GEOS 310 and Junior or above status
Notes: Normally taken during the student's Junior or Senior year; may be repeated for a total of up to six hours of credit.

GEOS 410 CAPSTONE III: SENIOR RESEARCH THESIS1 Credit
Research thesis is completed and presented at the Nebraska Academy of Sciences or other regional or national scientific forum approved by the faculty. Required field trip in late April. Normally taken during the student's Senior year.
Prerequisites: GEOS 401 and Junior or above status

GEOS 430 SPECIAL TOPICS IN GEOSCIENCE1-3 Credits
To meet special needs of Geoscience students.
Notes: May be repeated with different topics and approval of instructor for a total of six credit hours.

GEOS 431 HYDROGEOLOGY3 Credits
An introduction to the origin and nature of groundwater, its interaction with surface water, geological methods of groundwater exploration, and factors affecting water supply and quality.
Prerequisites: Junior or above status

GEOS 432 STRUCTURAL GEOLOGY3 Credits
Description and analysis of geologic structures and the regional and global tectonic forces that produce them. Possibly one or more field trips required.
Prerequisites: GEOS 231, GEOS 231L, and Junior or above status

GEOS 434 INTRODUCTION TO OCEANOGRAPHY3 Credits
An earth-system approach to study of the oceans. Includes discussion of physical and biological phenomena in the oceans; analyzes interactions among the hydrosphere atmosphere and geosphere; and considers humans as stewards of ocean resources. Field trips may be required.

GEOS 435 FIELD EXPERIENCE IN GEOSCIENCE1-3 Credits
Typically a one to three week workshop. Field excursions to study major geologic features and provinces in North America or elsewhere.
Add Consent: Instructor Consent

GEOS 436 FIELD EXCAVATION AND PROCEDURES1-3 Credits
A summer workshop designed to give the student field experience in the development of paleontological sites.
Prerequisites: Junior or above status
Add Consent: Instructor Consent

GEOS 437 WORLD ENVIRONMENTAL ISSUES3 Credits
Exploration of world environmental problems. Discussion participation setting emphasizes library research, accessing information, critical analysis of media news, and information and global perspective measures. The course culminates in student action plans that may affect environmental change.
Prerequisites: Junior or above status

GEOS 438 PETROLEUM GEOLOGY3 Credits
The origin, characteristics, occurrence, exploration, and development of/ for petroleum. Possibly one or more field trips.

GEOS 439 SEDIMENTOLOGY AND STRATIGRAPHY3 Credits
The origin and characteristics of sedimentary rocks.
Prerequisites: GEOS 231, GEOS 231L, GEOS 234, GEOS 234L and Junior or above status
Co-requisites: GEOS 439L

GEOS 439L SEDIMENTOLOGY AND STRATIGRAPHY LABORATORY1 Credit
Laboratory and field studies of sediments and sedimentary rocks.
Prerequisites: Junior or above status
Co-requisites: GEOS 439

GEOS 471 ADVANCED ASTRONOMY1-3 Credits
A quantitative study of topics introduced in GEOS 233. Includes astrophotography, deep sky viewing, and planetarium.
Prerequisites: GEOS 233/, GEOS 233L, and , GEOS 233L, and Junior or above status