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**MINNESOTA STATE  
UNIVERSITY**  
MANKATO

## **GEOLOGY** *College of Science, Engineering and Technology*

### **WHAT PROGRAMS DO WE OFFER?**

The **Geology B.S. major** provides a comprehensive undergraduate curriculum of Geology and supporting subjects (e.g., Chemistry, Physics, Geographic Information Systems). It is a four-year program: all core courses are offered every year, and electives provide grounding in groundwater, engineering, glacial geology, and resource geology.

The **Geology minor** is an excellent complement to related programs in Civil Engineering, Environmental Science, and Geography, among others.

The **Environmental Geology Certificate** offers a streamlined course of study focused on the Geology courses that are most applicable to addressing issues such as water quality management and pollution control. This certificate can be adopted by any student interested in pursuing employment in the growing environmental science job sector.

The Geology program is affiliated with the **B.S. Earth Science Teaching** program, which is offered in collaboration with the College of Education and the Department of Geography.

### **CAREER PATHS**

The Geology B.S. prepares students for careers in the geological sciences, addressing needs related to resources (energy and raw materials from the Earth), environment (groundwater, land use), hazards (earthquakes, landslides), and engineering, as well as graduate study in these and related fields. Our graduates enjoy very high placement rates and starting salaries up to and over \$75,000; others are accepted into graduate programs nationwide. Employers for geologists include industries (oil and mining companies, environmental consulting firms); local, state, and federal government agencies; and academic institutions.

If you enjoy the outdoors as well as science and math and think you would like solving intriguing Earth-related problems of societal importance, the Geology B.S. may provide a rewarding and fulfilling career path for you.

The B.S. Earth Science Teaching program, which draws heavily on Geology coursework, has launched graduates into teaching positions throughout the state and beyond.

### **FACULTY**

All faculty in MSU's Geology program possess the PhD and are devoted to teaching as well as being actively engaged in research. Undergraduates are involved in faculty research projects locally and across the country, and many travel to field areas as well as to regional and national professional conferences to present results. The Geology program benefits from its close affiliation with faculty in programs that offer coursework complementary to Geology, including Biology, Chemistry, Environmental Science, and Geography. It is also closely allied with the Water Resources Center on campus.

### **FACILITIES**

The Geology program is housed in LEED-certified Ford Hall, constructed in 2008, boasting modern classroom and lab facilities. The program houses a new X-ray diffractometer, a new X-ray fluorescence spectrometer, a sediment particle size analyzer, a suite of water chemical analysis instruments including a total organic carbon analyzer, a Linkam fluid inclusion heating/freezing stage, cathodoluminescence stage, and state of the art software for hydrogeological, geochemical, engineering, and image analysis applications.

In the Department of Chemistry and Geology, we have access to Gas Chromatographs and Atomic Absorption analyzers, among other instruments of use in Geology research. We also have full on-campus access to a Scanning Electron Microscope with Energy Dispersive Spectroscopy, GPS receivers, GIS software, water quality instruments, and other field and laboratory instrumentation.

### **PREPARATION FOR THE GEOLOGY OPTION PROGRAM**

As a physical science, Geology draws on quantitative skills; thus, courses in math (such as Calculus) and science (such as Physics and Chemistry) are important. At the same time, Geology involves a great deal of creative problem-solving skill in discerning the 'big picture' from careful observations, and thus its practice is greatly enhanced by a strong curiosity about the Earth and how it works.

## FOR MORE INFORMATION, PLEASE CONTACT

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 800-627-3529 or 711 (MRS/TTY)

### Website:

<http://cset.mnsu.edu/academic-programs/geology/>

You are encouraged to visit the campus.

To arrange for a visit, please call:

Office of Admissions: 507-389-1822

Toll-free: 800-722-0544

Or the department: 507-389-1963

## SAMPLE FOUR-YEAR CURRICULUM

First Year Semester 1	First Year Semester 2
GEOL 121 Physical Geology (4) MATH 112 College Algebra (4) ENG 101 Composition (3) (Gen Ed 1) CHEM 104 Introduction to Chemistry (3) FYEX 100 First Year Experience	GEOL 122 Earth History (4) MATH 113 Trigonometry (3) <b>OR</b> 115 (Pre-Calculus Mathematics) in place of 112 & 113) Req Gen Ed 2 (3) Req Gen Ed 3 (3) First Year Experience
Second Year Semester 1	Second Year Semester 2
GEOL 201 Mineralogy (4) CHEM 201 General Chemistry I (5) Req Gen Eds 4 (6)	MATH 121 Calculus I (4) PHYS 211 Principles of Physics I (4) Req Gen Eds 6 (9)
Third year Semester 1	Third Year Semester 2
GEOL 320W Stratigraphy and Sedimentology (4) GEOL Elective (3) (see Fall 4th year) GEOG Elective: 315 Geomorphology, 373 Intro to GIS, 471 Digital Mapping with GPS, or 474 Remote Sensing Req Gen Ed 9 (3)	GEOL 302 Petrology (4) GEOL 330 Structural Geology (4) GEOL Elective: 350 Environmental Geology <b>OR</b> 450 Hydrogeology (alt years) (3 or 4) GEOG elective: 373, 473 Intermediate GIS Req Gen Ed 10 (3)
Third Year Summer	
GEOL 440 Field Camp <b>OR</b> GEOL 497 Internship (capstone) (4+)	
Fourth Year Semester 1	Fourth Year Semester 2
GEOL Elective: 401 Field Studies No. Minn (3) <b>OR</b> GEOL 360 Soil Biogeochemistry (3), <b>OR</b> GEOL 410 Glacial Geology (3), <b>OR</b> GEOL 430 Petroleum & Ore Deposits Geology (3). Fall electives rotate: one offered per year GEOG elective: GEOG 315, 373, 471, or 474 Other electives (6)	GEOL Elective: 450 or 350 (alt years) (4 or 3) GEOG elective (3): 420 or 473 Other electives (6)

For additional information about course requirements, please visit <http://cset.mnsu.edu/academic-programs/geology/>

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