

## Earth Science

College of Social & Behavioral Sciences  
Department of Geography  
7 Armstrong Hall • 507-389-2617  
Web site: [www.mnsu.edu/dept/geog](http://www.mnsu.edu/dept/geog)  
[www.mnsu.edu/dept/geol](http://www.mnsu.edu/dept/geol)

Director: Donald Friend, Ph.D.

Earth Science studies the Earth's interrelated physical systems of atmosphere, biosphere, geosphere, hydrosphere, and outer space. Fundamental to Earth Science are the impacts of people and the interactions of chemical, physical, and biological processes at all spatial scales ranging from submicroscopic to planetary, and over time scales from the immediate to billions of years. Thus, courses in Astronomy, Biology, Chemistry, Geography, Geology, and Physics are required to fulfill degree requirements. Majors may choose to earn the BA or BS and there are options for teacher licensure in the "Science Teaching: Earth Science" program. An Earth Science minor is available.

Admission to Major is granted by the department. Minimum university admission requirements are:

- a minimum of 32 earned semester credit hours.
- a minimum cumulative GPA of 2.00 (C).

Contact the department for application procedures.

### EARTH SCIENCE BA, BS

Required for Major (Core, 43 credits):

|      |     |                                     |
|------|-----|-------------------------------------|
| AST  | 101 | Introduction to Astronomy (3)       |
| AST  | 102 | Introduction to the Planets (3)     |
| BIOL | 100 | Our Natural World (4)               |
| CHEM | 201 | General Chemistry I (5)             |
| GEOG | 101 | Introductory Physical Geography (3) |
| GEOG | 217 | Weather (3)                         |
| GEOG | 315 | Geomorphology (3)                   |
| GEOG | 410 | Climatic Environments (3)           |
| GEOL | 121 | Physical Geology (4)                |
| GEOL | 122 | Earth History (4)                   |
| GEOL | 201 | Elements of Mineralogy (4)          |
| PHYS | 211 | Principles of Physics I (4)         |

Required Electives for Major (6 credits):

Choose six credits from the following:

|      |     |                                       |
|------|-----|---------------------------------------|
| AST  | 125 | Observational Astronomy (3)           |
| BIOL | 432 | Limnology (4)                         |
| GEOG | 373 | Introduction to GIS (4)               |
| GEOG | 412 | Advanced Weather (4)                  |
| GEOG | 420 | Conservation of Natural Resources (3) |
| GEOG | 440 | Field Studies: Colorado               |
| GEOG | 440 | Field Studies: Field Methods          |
| GEOG | 480 | Seminar: Snow and Ice (3)             |
| GEOL | 270 | Structural Geology (4)                |
| GEOL | 350 | Environmental Geology (4)             |
| GEOL | 370 | Geotectonics (2)                      |
| GEOL | 450 | Hydrogeology                          |

Required for Bachelor of Arts (BA) degree ONLY:  
Language (8)

Minor Required: None.

### EARTH SCIENCE BS TEACHING (5-12)

Requirements for the Earth Science, Teaching major can be found in the SCIENCE TEACHING section of this bulletin.

### EARTH SCIENCE MINOR

Required General Education for Minor (17 credits):

|      |     |                                     |
|------|-----|-------------------------------------|
| AST  | 101 | Introduction to Astronomy (3)       |
| PHYS | 100 | Cultural Physics (3)                |
| CHEM | 100 | Chemistry in Society (4)            |
| BIOL | 100 | Our Natural World (4)               |
| GEOG | 101 | Introductory Physical Geography (3) |

Required for Minor (Core, 14 credits):

|      |     |                      |
|------|-----|----------------------|
| GEOL | 121 | Physical Geology (4) |
| GEOL | 122 | Earth History (4)    |
| GEOG | 217 | Weather (3)          |
| GEOG | 315 | Geomorphology (3)    |

Required Electives for Minor (3 credits):

Choose one from the following:

|      |     |                                       |
|------|-----|---------------------------------------|
| AST  | 102 | Introduction to the Planets (3)       |
| GEOG | 410 | Climatic Environments (3)             |
| GEOG | 420 | Conservation of Natural Resources (3) |

### POLICIES/INFORMATION

GPA Policy. A GPA of 2.0 or higher in a major or minor is required for graduation.

Refer to the College regarding required advising for students on academic probation.

P/N Grading Policy. All courses in earth science must be taken for a letter grade.