Earth Science

College of Social & Behavioral Sciences
Department of Geography
206 Morris Hall • 507-389-2617
Website: http://lbs.mnsu.edu/earthsience/

Director: Phillip Larson
Faculty: Paul Eskridge, Steven Kipp, Donald A. Friend, Bryce Hoppie, Steven Losh, Chad Wittkop, Forrest Wilkerson, Ginger Schmid, Thomas R. Brown, Martin Mitchell

The Earth Science program focuses study on the Earth’s interrelated natural systems of the atmosphere, biosphere, geosphere, hydrosphere, cryosphere and Earth’s place in the cosmos. Earth Science provides the scientific basis for understanding the interactions of chemical, physical and biological processes at all spatial and temporal scales on our planet - ranging from microscopic to planetary and on timescales from the immediate to billions of years. The impact of Earth systems and humans on one another are of paramount societal importance and are a focus of Earth Science studies.

The Earth Science program provides a number of pathways to study the science of our planet. The Earth Science major (BA or BS), the Certificate in Geomorphology and Earth Surface Processes and the minor in Earth Science are offered. An associated interdisciplinary certificate in “Geoarcheology” is described under “Anthropology” and an associated interdisciplinary certificate in “Geographic Information Science” is described under “Geography.” For secondary teacher licensure, see the “Science Teaching” program and major.

Academic Map/Degree Plan at www.mnsu.edu/programs/#All

POLICIES/INFORMATION

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.

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.

EARTH SCIENCE BA and BS

Degree completion = 120 credits

Major Common Core

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST 101</td>
<td>Introduction to Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>AST 102</td>
<td>Introduction to the Planets</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 100</td>
<td>Our Natural World</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>GEOG 101</td>
<td>Introductory Physical Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 217</td>
<td>Weather</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 315</td>
<td>Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 410</td>
<td>Climatic Environments</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 121</td>
<td>Physical Geology</td>
<td>4</td>
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<tr>
<td>GEOG 122</td>
<td>Earth History</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 201</td>
<td>Elements of Mineralogy</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Principles of Physics I</td>
<td>4</td>
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Major Restricted Electives (choose 6 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>AST 125L</td>
<td>Observational Astronomy</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 432</td>
<td>Lake Ecology</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 313</td>
<td>Natural Disasters</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 370</td>
<td>Cartographic Techniques</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 373</td>
<td>Introduction to Geographic Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 411</td>
<td>Soils Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 412</td>
<td>Advanced Weather</td>
<td>4</td>
</tr>
</tbody>
</table>

GEOG 414 | Biogeography | 3 |
GEOG 415 | Earth Surface Processes | 4 |
GEOG 416W | Fluvial Geomorphology and Hydrology | 4 |
GEOG 420 | Conservation of Natural Resources | 3 |
GEOG 440 | Field Studies | 1-4 |
GEOG 471 | Digital Field Mapping with GPS | 4 |
GEOG 474 | Introduction to Remote Sensing | 4 |
GEOG 480 | Seminar | 1-4 |
GEOL 302 | Petrology | 4 |
GEOL 320W | Sedimentology and Stratigraphy | 4 |
GEOL 330 | Structural Geology | 4 |
GEOL 370 | Geotectonics | 2 |
GEOL 410 | Glacial Geology | 3 |
GEOL 450 | Hydrogeology | 3 |
GEOL 497 | Internship | 1-10 |

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

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 catalog.

Other Graduation Requirements

See the SECONDARY EDUCATION section for admission requirements to Professional Education and a list of required professional education courses.

GEOMORPHOLOGY AND EARTH SURFACE PROCESSES CERTIFICATE

Geomorphology is the study of the form and character of the Earth’s surface. Earth Surface Processes shape and transform our planet’s landscape. Students will develop a broad theoretical understanding and learn to apply specific analytical skill to the field of Geomorphology through a multi-disciplinary curriculum in Geography, Geology, and Anthropology.

Major Common Core

Take either GEOG 315 or GEOG 415 and GEOG 410

GEOG 315 | Geomorphology | 3 |
GEOG 415 | Earth Surface Processes | 4 |
GEOG 410 | Climatic Environments | 3 |

Major Restricted Electives (choose one from the following)

GEOG 411 | Soils Geomorphology | 3 |
GEOG 416W | Fluvial Geomorphology and Hydrology | 4 |

Major Unrestricted Electives

At least six credits must be taken. Choose courses from two of the three listed departments. GEOG 411 and GEOG 416 can be taken as an unrestricted elective if they were not taken as a restricted elective.

ANTH 331 | Environmental Anthropology | 3 |
GEOG 411 | Soils Geomorphology | 3 |
GEOG 416W | Fluvial Geomorphology and Hydrology | 4 |
GEOG 440 | Field Studies | 1-4 |
GEOL 201 | Elements of Mineralogy | 4 |
GEOL 320W | Sedimentology and Stratigraphy | 4 |