Earth Systems Science

College of Natural Science and Mathematics
Department of Geology and Geophysics
907-474-7565
www.uaf.edu/geology/

BA Degree

Minimum Requirements for Degree: 120–130 credits

This program provides broad training in various aspects of earth systems science. Three concentrations are available: earth systems science, geological hazards and mitigation, and secondary education. The concentrations allow students to focus on different interests and career paths during their junior and senior years but offer considerable flexibility during the freshman and sophomore years.

The earth science concentration offers students a sound background in a broad spectrum of geoscientific disciplines, with an emphasis on the interaction between earth systems. The geological hazards and mitigation concentration is designed for students who wish to pursue careers in communicating science, hazards analysis or emergency management-related natural disasters. The secondary education concentration is designed for students who plant to teach earth science in secondary school in Alaska. Requirements for certified teachers have been built in to this concentration in consultation with the School of Education. Students choosing this concentration should consult with both the Department of Geology and Geophysics and the School of Education for advising.

Major — BA Degree

1. Complete the general university requirements. (See page 129. As part of the core curriculum requirements, complete: NRM F303X*, CHEM F103X and CHEM F104X or CHEM F105X and CHEM F106X or PHYS F103X and PHYS F104X).

2. Complete the BA degree requirements. (See page 133. Note that social science (s) courses are included in each of the concentrations. These courses may also be applied to the BA degree requirements).

3. Complete the following foundation courses:*
   - GEOS F101X—The Dynamic Earth (4)
   - or GEOS F120X—Glaciers, Earthquakes and Volcanoes (4)......4
   - GEOS F112X—The History of Earth and Life (4) or
   - GEOS F106X—Life in the Age of Dinosaurs(4)..................4

4. Complete one of the following concentrations:

Earth Systems Science

a. Complete the following:*        b. Complete one course from each of the following areas:*        Earth Systems
   - GEOS F304—Geomorphology ..................................................3
   - GEOS F315W—Paleobiology and Paleontology .............................4

Earth Materials
   - GEOG F101—Expedition Earth: Introduction to Geography ..........3
   - MSL F111X—The Oceans .........................................................4
   - NRM F101—Natural Resource Conservation Policy .....................3
   - PHYS F175X—Introduction to Astronomy .................................4

Geospatial Sciences
   - GEOS F213—Mineralogy .......................................................4
   - GEOS F262—Rocks and Minerals .............................................3

Geospatial Sciences
   - GEOS F338—Introduction to Geographic Information Systems ....3
   - GEOS F222—Fundamentals of Geospatial Sciences .................3
   - GEOS F225—Field and Computer Methods in Geology (2) and
   - GEOS F408—Photogeology (2) .............................................4

Weather and Climate
   - ATM F101X—Weather and Climate of Alaska .........................4
   - GEOF F307—Weather and Climate ........................................3

Natural Resources
   - GEOF F302—Geography of Alaska ......................................3
   - GEOF F402—Resources and Environment ...............................3

Geoscience
   - GEOF F309—Tectonics ..........................................................3
   - GEOF F322—Stratigraphy and Sedimentation ..........................4

Geobiology
   - GEOF F485—Mass Extinctions, Neocatastrophism, and the
   - History of Life ........................................................................3
   - GEOF F486—Vertebrate Paleontology ....................................3

d. Complete 9 additional credits at the F300 level or above with an
   emphasis in geology, geography, biology, natural resources management or
   other earth science-related field as approved by the undergraduate
   advisor, including one W (writing-intensive) course and one O
   (oral-intensive) course. ..............................................................9

e. Complete any UAF minor. Courses used to satisfy the upper-division
   emphasis may also be applied towards the requirements for a minor.

f. Minimum credits required ....................................................120

Geological Hazards and Mitigation

c. Complete one course from any two of the following areas:*        Weather and Climate
   - ATM F101X—Weather and Climate of Alaska .........................4
   - GEOF F307—Weather and Climate ........................................3

Natural Resources
   - GEOF F302—Geography of Alaska ......................................3
   - GEOF F402—Resources and Environment ...............................3

Geoscience
   - GEOF F309—Tectonics ..........................................................3
   - GEOF F322—Stratigraphy and Sedimentation ..........................4

Geobiology
   - GEOF F485—Mass Extinctions, Neocatastrophism, and the
   - History of Life ........................................................................3
   - GEOF F486—Vertebrate Paleontology ....................................3

d. Complete 9 additional credits at the F300 level or above with an
   emphasis in geology, geography, biology, natural resources management or
   other earth science-related field as approved by the undergraduate
   advisor, including one W (writing-intensive) course and one O
   (oral-intensive) course. ..............................................................9

e. Complete any UAF minor. Courses used to satisfy the upper-division
   emphasis may also be applied towards the requirements for a minor.

f. Minimum credits required ....................................................120
### Secondary Education

#### a. Complete the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG F101</td>
<td>Expedition Earth: Introduction to Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOS F262</td>
<td>Rocks and Minerals</td>
<td>3</td>
</tr>
<tr>
<td>GEOS F315W</td>
<td>Paleobiology and Paleontology</td>
<td>4</td>
</tr>
<tr>
<td>GEOS F475</td>
<td>Presentation Techniques in the Geosciences</td>
<td>2</td>
</tr>
<tr>
<td>MSL F111X</td>
<td>The Oceans</td>
<td>4</td>
</tr>
<tr>
<td>PHYS F175X</td>
<td>Introduction to Astronomy</td>
<td>4</td>
</tr>
<tr>
<td>PSY F101</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

#### b. Complete one course from each of the following areas:

**Landform Analysis**
- GEOG F111X—Earth and Environment: Elements of Physical Geography ................................................................. 4
- GEOS F304—Geomorphology ........................................................................................................................................ 3

**Geospatial Sciences**
- GEOS F222—Fundamentals of Geospatial Sciences .................................................................................................. 3
- GEOS F225—Field and Computer Methods in Geology ......................................................................................... 2
- GEOS F338—Introduction to Geographic Information Systems ......................................................................... 3

**Weather and Climate**
- ATM F101X—Weather and Climate of Alaska ........................................................................................................ 4
- GEOG F307—Weather and Climate ....................................................................................................................... 3

**Natural Resources**
- GEOG F302—Geography of Alaska ...................................................................................................................... 3
- GEOG F402—Resources and Environment ........................................................................................................... 3

**Evolutionary Processes**
- GEOS F309—Tectonics ........................................................................................................................................ 3
- GEOG F485—Mass Extinctions, Neocatastrophism, and the History of Life .......................................................... 3
- GEOS F486—Vertebrate Paleontology ................................................................................................................ 3

#### c. Complete the requirements for a minor in secondary education (see page 158) ................................................. 16

#### d. Complete the additional requirements of the secondary education licensure program (see page 159)** .......................... 19

#### e. Minimum credits required ............................................................................................................................... 130

*Students must earn a C- grade or better in each course.*

**Note: We strongly recommend that prospective secondary science teachers seek advising from the UAF School of Education early in your undergraduate degree program, so that you can be appropriately advised of the state of Alaska requirements for teacher licensure.*