Earth, Energy, and Environmental Sciences - Geoscience Emphasis, BS

Program Description

The Earth, Energy, and Environmental Sciences major is an interdisciplinary study of the relevant natural science disciplines, with emphases in either the Geosciences or the Environmental Sciences. This program provides knowledge and experience through lecture, laboratory, and field courses that immerse the students into the world around them. Students will analyze and solve problems associated with use of energy, water, and mineral resources; in protection of the environment; in planning for the impact of natural hazards; and in sustainable approaches to societal development. The region and ecosystems that surround Dixie State University provide the ideal laboratory to apply concepts to the earth, energy, and environmental issues that impact the future of humanity. Emphases in the Geosciences and the Environmental Sciences are available depending the student interests.

Program Curriculum

120 credits

DSU General Education Requirements

All DSU General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to DSU’s minimum General Education standards in American Institutions, English, and Mathematics.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General Education Core Requirements (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>3-7</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>American Institutions</td>
<td>3-6</td>
<td></td>
</tr>
<tr>
<td>Life Sciences</td>
<td>3-10</td>
<td></td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Laboratory Science</td>
<td>0-1</td>
<td></td>
</tr>
<tr>
<td>Fine Arts</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Literature/Humanities</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Exploration</td>
<td>3-5</td>
<td></td>
</tr>
</tbody>
</table>

Earth, Energy, & Environmental Science Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS 1210 (catalog.dixie.edu/search/?P=ENVS%201210/) &amp; ENVS 1215 (catalog.dixie.edu/search/?P=ENVS%201215/)</td>
<td>Introduction to Environmental Science and Introduction to Environmental Science Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>ENVS 2210 (catalog.dixie.edu/search/?P=ENVS%202210/)</td>
<td>Environmental Pollution and Remediation Techniques</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 3280 (catalog.dixie.edu/search/?P=ENVS%203280/)</td>
<td>Environmental Policy, Regulations, Health, and Safety</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 3410 (catalog.dixie.edu/search/?P=ENVS%203410/)</td>
<td>Air Quality and Control Technologies</td>
<td>3</td>
</tr>
<tr>
<td>ENER 2310 (catalog.dixie.edu/search/?P=ENER%202310/)</td>
<td>Energy and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>ENER 4310 (catalog.dixie.edu/search/?P=ENER%204310/)</td>
<td>Energy Technology and Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>GEO 1110 (catalog.dixie.edu/search/?P=GEO%201110/) &amp; GEO 1115 (catalog.dixie.edu/search/?P=GEO%201115/)</td>
<td>Physical Geology (PS) and Physical Geology Lab (LAB)</td>
<td>4</td>
</tr>
</tbody>
</table>
Earth, Energy, and Environmental Sciences - Geoscience Emphasis, BS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 2050</td>
<td>Earth Materials</td>
<td>4</td>
</tr>
<tr>
<td>GEO 3400</td>
<td>Water Resources</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 2410</td>
<td>Paleoclimatology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 3600, GEOG 3605</td>
<td>Introduction to Geographic Information Systems and Introduction to Geographic Information Systems Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1210, CHEM 1215</td>
<td>Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 1220, CHEM 1225</td>
<td>Principles of Chemistry II and Principles of Chemistry II Lab</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 1610, BIOL 1615</td>
<td>Principles of Biology I (LS) and Principles of Biology I Lab (LAB)</td>
<td>5</td>
</tr>
<tr>
<td>MATH 1210</td>
<td>Calculus I (MA) (Prerequisite: MATH 1010 and MATH 1050 and MATH 1060 or MATH 1080 or equivalent placement score)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2210, PHYS 2215</td>
<td>Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab (LAB)</td>
<td>5</td>
</tr>
<tr>
<td>ENGL 2201</td>
<td>Literature and the Land (HU, GC)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Geoscience Emphasis Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 1220, GEO 1225</td>
<td>Historical Geology and Historical Geology Lab</td>
<td>4</td>
</tr>
<tr>
<td>GEO 2700R</td>
<td>Field Methods in Geoscience Research</td>
<td>1</td>
</tr>
<tr>
<td>GEO 2990R</td>
<td>Seminar in Geology</td>
<td>1</td>
</tr>
<tr>
<td>GEO 3060</td>
<td>Environmental Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 3180</td>
<td>Paleontology</td>
<td>4</td>
</tr>
<tr>
<td>GEO 3550</td>
<td>Sedimentology &amp; Stratigraphy</td>
<td>4</td>
</tr>
<tr>
<td>GEO 3700</td>
<td>Structural Geology</td>
<td>4</td>
</tr>
<tr>
<td>GEO 3710</td>
<td>Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 4800R</td>
<td>Independent Research</td>
<td>1-3</td>
</tr>
<tr>
<td>GEO 4910</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>
Choose 1 of the following courses:

- ENVS 3910 (catalog.dixie.edu/search/?P=ENVS%203910/) Costa Rica Natural History 3
- ENVS 3920 (catalog.dixie.edu/search/?P=ENVS%203920/) Peruvian Amazon Natural History 3
- ENVS 3930 (catalog.dixie.edu/search/?P=ENVS%203930/) South Africa Natural History 3
- GEO 3000 (catalog.dixie.edu/search/?P=GEO%203000/) Advanced Geologic Investigation of Grand Canyon, Zion, and Bryce National Parks 3
- GEO 3910 (catalog.dixie.edu/search/?P=GEO%203910/) Applied Geologic Investigation of Iceland 3
- GEOG 3930 (catalog.dixie.edu/search/?P=GEOG%203930/) Remote Sensing of Landscape: China 3

Graduation Requirements

1. Complete a minimum of 120 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at DSU for institutional residency.
4. Cumulative GPA 2.0 or higher.
5. Grade C- or higher in all required courses.

Graduation Plan

1st Year

Fall Semester

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS 1210</td>
<td>Introduction to Environmental Science and Introduction to Environmental Science Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>&amp; ENVS 1215</td>
<td>Physical Geology (PS) and Physical Geology Lab (LAB)</td>
<td>4</td>
</tr>
<tr>
<td>GEO 1110</td>
<td>Principles of Biology I (LS) and Principles of Biology I Lab (LAB)</td>
<td></td>
</tr>
<tr>
<td>&amp; GEO 1115</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 1010</td>
<td>Introduction to Writing (EN)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1210</td>
<td>Calculus I (MA) (Prerequisite: MATH 1010 and MATH 1050 or MATH 1060 or MATH 1080 or equivalent placement score)</td>
<td>4</td>
</tr>
</tbody>
</table>

Spring Semester

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1610</td>
<td>Principles of Biology I (LS) and Principles of Biology I Lab (LAB)</td>
<td>5</td>
</tr>
<tr>
<td>ENGL 1010</td>
<td>Interim Writing Selected Topics: (EN)</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>PHYS 2210</td>
<td>Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 2215</td>
<td>(LAB)</td>
<td></td>
</tr>
<tr>
<td>GEO 1220</td>
<td>Historical Geology and Historical Geology Lab</td>
<td>4</td>
</tr>
<tr>
<td>GEO 1225</td>
<td>(LAB)</td>
<td></td>
</tr>
<tr>
<td>ENVS 2210</td>
<td>Environmental Pollution and Remediation Techniques</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 2410</td>
<td>Paleoclimatology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1210</td>
<td>Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 1215</td>
<td>(LAB)</td>
<td></td>
</tr>
<tr>
<td>GEO 2700R</td>
<td>Field Methods in Geoscience Research</td>
<td>1</td>
</tr>
<tr>
<td>GE Social &amp; Behavioral Science</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENER 2310</td>
<td>Energy and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>GEO 2050</td>
<td>Earth Materials</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1220</td>
<td>Principles of Chemistry II and Principles of Chemistry II Lab</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 1225</td>
<td>(LAB)</td>
<td></td>
</tr>
<tr>
<td>GEO 2990R</td>
<td>Seminar in Geology</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 2201</td>
<td>Literature and the Land (HU, GC)</td>
<td>3</td>
</tr>
<tr>
<td>ENVS 3280</td>
<td>Environmental Policy, Regulations, Health, and Safety</td>
<td>3</td>
</tr>
<tr>
<td>GEO 3400</td>
<td>Water Resources</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Hours</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>GEO 3060</td>
<td>Environmental Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 3550</td>
<td>Sedimentology &amp; Stratigraphy</td>
<td>4</td>
</tr>
<tr>
<td>ENVS 3410</td>
<td>Air Quality and Control Technologies</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 3600</td>
<td>Introduction to Geographic Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 3605</td>
<td>Introduction to Geographic Information Systems Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>GE American Institutions</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GEO 3700</td>
<td>Structural Geology</td>
<td>4</td>
</tr>
<tr>
<td>ENER 4310</td>
<td>Energy Technology and Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>Elective Credit</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>GEO 3710</td>
<td>Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 4800R</td>
<td>Independent Research</td>
<td>1</td>
</tr>
<tr>
<td>GEO 3000</td>
<td>Advanced Geologic Investigation of Grand Canyon, Zion, and Bryce National Parks (or Elective Field Course)</td>
<td>3</td>
</tr>
<tr>
<td>Upper Division Elective Credit</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Elective Credit</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>GEO 3180</td>
<td>Paleontology</td>
<td>4</td>
</tr>
<tr>
<td>GEO 4910</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

### Earth, Energy & Environmental Sciences - Geoscience Emphasis Program Learning Outcomes

At the successful conclusion of this program, students will be able to:

1. Articulate the interdisciplinary nature of the issues related to geological, environmental, and energy sciences.
2. Formulate sustainable approaches to energy and earth science issues that integrate environmental, economic, and sociopolitical perspectives.
3. Distinguish between Earth’s surface and deep energy sources and the processes they power and appraise how we depend on and harvest those energy resources to sustain our society.
4. Use appropriate methodological tools to analyze and address research questions in the earth, energy and environmental sciences.
5. Evaluate the effects of geologic time as they pertain to the interactive nature of and changes to Earth systems. (Geosphere, atmosphere, hydrosphere, and biosphere)