HAUB SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES

Students interested in earning a B.S. in Environmental Systems Science (ESS) should contact haub.school@uwyo.edu for more information about the program and to schedule an appointment with an academic advisor.

---

**Environmental Systems Science**

**B.S. - 68+ credit hours**

**FOUNDATIONS (23 credit hours)**
- Introduction to Systems Science
- Foundation of Biological Sciences 1 course
- Foundation of Earth Sciences 1 course

Foundation of Physical Sciences 3 courses
- General Physics I
- General Chemistry I
- Geochemical Cycles in the Earth System

**SPHERES (15 credit hours)**
- Anthrosphere 1 course
- Atmosphere 1 course
- Biosphere 1 course

Lithosphere 2 courses
- 1 course in environmental change
- 1 course in hydrology & surface processes

**SKILLS & TOOLS (12 credit hours)**
Choose 1 course from each category:
- Calculus
- Data Analysis
- GIS/Remote Sensing
- Applied Experience

**MINOR (18+ credit hours)**
As an area of focus, students must declare an existing minor:
- Agroecology
- Anthropology
- Astronomy
- Biology
- Botany
- Chemistry
- Environment & Natural Resources
- Forest Resources
- Geographic Information Sciences (GIS)
- Geography
- Geology
- Insect Biology
- Land Surveying
- Paleoenvironmental Studies
- Physics
- Planning
- Rangeland Ecology & Watershed Management
- Reclamation & Restoration Ecology
- Remote Sensing
- Soil Science
- Statistics
- Sustainability
- Wildlife & Fisheries Biology & Management
- Zoology
- Other (subject to advisor approval)

---

**Learning Outcomes**

A student earning a B.S. in Environmental Systems Science will
- demonstrate a knowledge of interdisciplinary perspective and integrative thinking,
  - understand physical and biological components of environmental systems, including the human component,
- design, conduct, and interpret scientific investigations,
  - understand the ethics of scientific investigation,
  - demonstrate proficiency in data collection, statistical analysis, and use of information technology tools and modeling,
- apply systems concepts to problems concerning environmental systems and their components,
  - construct conceptual and quantitative systems models,
- examine spatial, temporal, and spatial-temporal patterns in environmental systems, and
  - use information technology tools to depict, project, and communicate such patterns.
### FOUNDATIONS - 23 credits

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intro to Systems Science</strong></td>
<td>1 course Wyoming in the Earth System ESS 1000</td>
</tr>
<tr>
<td><strong>Foundation of Biological Sciences</strong></td>
<td>1 course Environment ENR 1200, General Biology LIFE 1010</td>
</tr>
<tr>
<td><strong>Foundation of Earth Sciences</strong></td>
<td>1 course Water, Dirt &amp; Climate ENR 1500, Physical Geography GEOG 1010, Physical Geology GEOL 1100</td>
</tr>
<tr>
<td><strong>Foundation of Physical Sciences</strong></td>
<td>3 courses General Chemistry I CHEM 1020, Geochemical Cycles in the Earth System ESS/GEOL 2000, General Physics PHYS 1110</td>
</tr>
</tbody>
</table>

### SPHERES - 15 credits

<table>
<thead>
<tr>
<th>Sphere</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anthroposphere</strong></td>
<td>1 course Environmental Anthropology ANTH/ENR 4310, Conservation of Natural Resources ENR/GEOG 4040, Environmental Sociology SOC 3950</td>
</tr>
<tr>
<td><strong>Biosphere</strong></td>
<td>1 course Biogeography GEOG 4460, Animal Biology LIFE 2022, Biology of Plants &amp; Fungi LIFE 2023</td>
</tr>
<tr>
<td><strong>Lithosphere</strong></td>
<td>2 courses Choose 1 course in environmental change Environmental Change GEOG 3480, Global Change: A Geological Perspective GEOL 3500</td>
</tr>
<tr>
<td></td>
<td>Choose 1 course in hydrology &amp; surface processes Wildland Hydrology ENR/REWM 4285, Geomorphology GEOL 2150, Geomorphology of Earth's Dynamic Landscapes GEOL 3010, Watershed Management REWM 4700</td>
</tr>
</tbody>
</table>

### SKILLS & TOOLS - 12 credits

<table>
<thead>
<tr>
<th>Skill</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calculus</strong></td>
<td>1 course Calculus MATH 2200</td>
</tr>
<tr>
<td><strong>Data Analysis</strong></td>
<td>1 course Risk Analysis ENR 4500, Environmental Data Analysis GEOL 4525</td>
</tr>
<tr>
<td><strong>Applied Experience</strong></td>
<td>1 course Internship ESS 4970</td>
</tr>
</tbody>
</table>

### MINOR - 18+ credits

Requirements will vary