

# Earth, Energy, and Environmental Sciences - Geoscience Emphasis, B.S.

## 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 Utah Tech 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 on the student interests.

## Program Curriculum

120 credits

### Utah Tech General Education Requirements

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

Code	Title	Hours
General Education Core Requirements ( <a href="http://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )		
English		3-7
Mathematics		3-5
American Institutions		3-6
Life Sciences		3-10
Physical Sciences		3-5
Laboratory Science		0-1
Fine Arts		3
Literature/Humanities		3
Social & Behavioral Sciences		3
Exploration		3-5

### Earth, Energy, & Environmental Science Core Requirements

Code	Title	Hours
ENVS 1210 & ENVS 1215	Introduction to Environmental Science and Introduction to Environmental Science Laboratory	4
ENVS 2210	Environmental Pollution and Remediation Techniques	3
ENVS 3280	Environmental Policy, Regulations, Health, and Safety	3
ENVS 3410	Air Quality and Control Technologies	3
ENER 2310	Energy and the Environment	3
ENER 4310	Energy Technology and Sustainability	3
GEO 1110 & GEO 1115	Physical Geology (PS) and Physical Geology Lab (LAB)	4
GEO 2050	Earth Materials	4
GEO 3400	Water Resources	3
GEOG 2410	Paleoclimatology	3
GEOG 3600 & GEOG 3605	Introduction to Geographic Information Systems and Introduction to Geographic Information Systems Laboratory	4
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
CHEM 1220 & CHEM 1225	Principles of Chemistry II and Principles of Chemistry II Lab	5

BIOL 1610 & BIOL 1615	Principles of Biology I (LS) and Principles of Biology I Lab (LAB)	5
MATH 1210	Calculus I (MA) (Prerequisite: MATH 1010 and MATH 1050 and MATH 1060 or MATH 1080 or equivalent placement score)	4
PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab (LAB)	5
ENGL 2201	Literature and the Land (HU, GC)	3

## Geoscience Emphasis Requirements

Code	Title	Hours
GEO 1220 & GEO 1225	Historical Geology and Historical Geology Lab	4
GEO 2700R	Field Methods in Geoscience Research	1
GEO 2990R	Seminar in Geology	1
GEO 3060	Environmental Geology	3
GEO 3180	Paleontology	4
GEO 3550	Sedimentology & Stratigraphy	4
GEO 3700	Structural Geology and Tectonics	4
GEO 3710	Hydrology	3
GEO 4800R	Independent Research	1-3
GEO 4910	Senior Seminar	1

Code	Title	Hours
Choose 1 of the following courses:		
ENVS 3910	Costa Rica Natural History	3
ENVS 3920	Peruvian Amazon Natural History	3
ENVS 3930	South Africa Natural History	3
GEO 3000	Advanced Geologic Investigation of Colorado Plateau Basin and Range provinces through national parks	3
GEO 3910	Applied Geologic Investigation of Iceland	3
GEOG 3930	Remote Sensing of Landscape: China	3
GEO 3500	Geomorphology	4

## 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 Utah Tech 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	Hours	Spring Semester	Hours
ENVS 1210 & ENVS 1215		4 BIOL 1610 & BIOL 1615	5
GEO 1110 & GEO 1115		4 ENGL 2010	3
ENGL 1010		3 PHYS 2210 & PHYS 2215	5
MATH 1210 (Prerequisite: MATH 1010 and MATH 1050 and MATH 1060 or MATH 1080 or equivalent placement score)		4 GEO 1220 & GEO 1225	4

**2nd Year**

<b>Fall Semester</b>	<b>Hours</b>	<b>Spring Semester</b>	<b>Hours</b>
ENER 2310		3 ENVS 2210	3
GEOG 2410		3 GEO 2050	4
CHEM 1210 & CHEM 1215		5 CHEM 1220 & CHEM 1225	5
GEO 2700R		1 GEO 2990R	1
GE Social & Behavioral Science		3 ENGL 2201	3
		<b>15</b>	<b>16</b>

**3rd Year**

<b>Fall Semester</b>	<b>Hours</b>	<b>Spring Semester</b>	<b>Hours</b>
ENVS 3280		3 ENVS 3410	3
GEO 3400		3 GEOG 3600 & GEOG 3605	4
GE Fine Arts		3 GE American Institutions	3
GEO 3060		3 GEO 3700	4
GEO 3550		4	
		<b>16</b>	<b>14</b>

**4th Year**

<b>Fall Semester</b>	<b>Hours</b>	<b>Spring Semester</b>	<b>Hours</b>
ENER 4310		3 Upper Division Elective Credit	4
Elective Credit		3 Elective Credit	5
GEO 3710		3 GEO 3180	4
GEO 4800R		1 GEO 4910	1
GEO 3000 (Fall Only Elective, or Study Abroad Course)		3	
		<b>13</b>	<b>14</b>

**Total Hours 120****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)