

# GEOLOGY: ENVIRONMENTAL GEOLOGY, BS

for the degree of Bachelor of Science in Geology, Environmental Geology Concentration (Specialized Curriculum)

The **Specialized Curriculum in Geology (BS)** is designed for students who plan to pursue graduate study in geology or geophysics or who wish to work professionally in the environmental field upon obtaining the bachelor's degree. It consists of geology, geophysics, and environmental geology areas, and offers more training in geology and related science than is required of students who make geology their major in the Sciences and Letters Curriculum. Students must choose one of the following: Geology, Geophysics, or Environmental Geology.

## Undergraduate Degree Programs in Geology

### For the Degree of Bachelor of Science in Liberal Arts and Sciences

Students select one of the following in consultation with an adviser:

- Major in Geology (Sciences and Letters) (<http://catalog.illinois.edu/undergraduate/las/geology-bslas/>)
- Major in Geology (Sciences and Letters), Earth and Environmental Sciences Concentration (<http://catalog.illinois.edu/undergraduate/las/geology-bslas/earth-environmental-sciences/>)
- Major in Geology (Sciences and Letters), Earth Science Teaching Concentration (<http://catalog.illinois.edu/undergraduate/las/geology-bslas/earth-science-teaching/>)

### For the Degree of Bachelor of Science in Geology

Students select one of the following in consultation with an adviser:

- Major in Geology (Specialized Curriculum) (<http://catalog.illinois.edu/undergraduate/las/geology-bs/>)
- Major in Geology (Specialized Curriculum), Environmental Geology Concentration (p. 1)
- Major in Geology (Specialized Curriculum), Geophysics Concentration (<http://catalog.illinois.edu/undergraduate/las/geology-bs/geophysics/>)

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Graduation requires a grade point average of at least 2.0 overall and a 2.0 average in all required science and technical courses (geology, physics, mathematics, chemistry, and technical requirements listed below). The Department of Earth Science & Environmental Change will supply a Guide for Geology Undergraduates upon request. This guide gives more information about the curriculum.

## Departmental Distinction:

Students majoring in Geology can earn distinction, high distinction, and highest distinction upon graduation. The requirements for these awards are:

- **Distinction:** A minimum cumulative grade point average of 3.3, and have also completed an approved independent study project, approved senior thesis, or approved capstone.
- **High Distinction:** A minimum cumulative grade point average of 3.5, and have also completed an approved independent study project, approved senior thesis, or approved capstone.
- **Highest Distinction:** A minimum cumulative grade point average of 3.7, and also completed an approved senior thesis or approved research capstone.

**General education: Students must complete the Campus General Education (<https://courses.illinois.edu/gened/DEFAULT/DEFAULT/>) requirements including the campus general education language requirement.**

**Minimum hours required for graduation: 126 hours.**

Code	Title	Hours
<b>Chemistry- Select one group of courses:</b>		
CHEM 102	General Chemistry I	<b>8-9</b>
CHEM 103	General Chemistry Lab I	
CHEM 104	General Chemistry II	
CHEM 105	General Chemistry Lab II	
or		
CHEM 202	Accelerated Chemistry I	<b>8-9</b>
CHEM 203	Accelerated Chemistry Lab I	
CHEM 204	Accelerated Chemistry II	
CHEM 205	Accelerated Chemistry Lab II	
or		
<b>24 hours of Geology Courses</b>		
GEOL 107	Physical Geology (Students who decide to follow the curriculum after first taking GEOL 100 should enroll in GEOL 208. GEOL 100 will be accepted as a substitute for GEOL 107, but students should be aware that these courses are not intended for science majors.)	4
GEOL 208	History of the Earth System	4
GEOL 380	Environmental Geology	4
GEOL 401	Geomorphology	4
GEOL 451	Environmental Geophysics	4
or GEOL 452	Introduction to Geophysics	4
GEOL 470	Introduction to Hydrogeology	4
<b>Mathematics</b>		<b>11-12</b>
MATH 220	Calculus	
or MATH 221	Calculus I	
MATH 231	Calculus II	
MATH 241	Calculus III	
<b>Physics</b>		<b>8-10</b>
PHYS 211 & PHYS 212	University Physics: Mechanics and University Physics: Elec & Mag	
or		

PHYS 101 & PHYS 102	College Physics: Mech & Heat and College Physics: E&M & Modern	
<b>Statistics- Select one of the following:</b>		<b>4</b>
CPSC 440	Applied Statistical Methods I	
STAT 400	Statistics and Probability I	
<b>Additional Technical Requirements</b>		<b>24</b>
Select from the following courses. At least 9 hours must be geology courses and at least 9 hours must be non-geology courses.		
CEE 330	Environmental Engineering	
CHEM 232	Elementary Organic Chemistry I	
CS 101	Intro Computing: Engrg & Sci	
CS 125	Introduction to Computer Science	
ENVS 431		
GGIS 477	Introduction to Remote Sensing	
GEOL 411	Structural Geol and Tectonics	
GEOL 417	Geol Field Methods, Western US (GEOL 417 is a 6-hour summer field course taught off campus.)	
GEOL 432	Mineralogy and Mineral Optics	
GEOL 436	Petrology and Petrography	
GEOL 440	Sedimentology and Stratigraphy	
GEOL 460	Geochemistry	
MATH 225	Introductory Matrix Theory	
MATH 415	Applied Linear Algebra	
MATH 285	Intro Differential Equations	
MATH 441	Differential Equations	
MCB 100	Introductory Microbiology	
MCB 101	Intro Microbiology Laboratory	
PHYS 213	Univ Physics: Thermal Physics	
PHYS 214	Univ Physics: Quantum Physics	
STAT 420	Methods of Applied Statistics	
TAM 210	Introduction to Statics	
TAM 211	Statics	

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## Sample Sequence

This sample sequence is intended to be used only as a guide for degree completion. All students should work individually with their academic advisors to decide the actual course selection and sequence that works best for them based on their academic preparation and goals. Enrichment programming such as study abroad, minors, internships, and so on may impact the structure of this four-year plan. Course availability is not guaranteed during the semester indicated in the sample sequence.

Students must fulfill their Language Other Than English requirement by successfully completing a third level of a language other than English. See the corresponding section on the Degree and General Education Requirements page (<http://catalog.illinois.edu/general-information/degree-general-education-requirements/>).

<b>First Year</b>		
<b>First Semester</b>		<b>Hours</b>
Free Elective course		1
CHEM 102 or 202		3
CHEM 103 or 203		2
Language Other Than English (3rd level)		4
Composition I or General Education course		4
Free Elective course		2
		<b>16</b>

### Total Hours 16

<b>First Year</b>		
<b>Second Semester</b>		<b>Hours</b>
GEOL 208		4
CHEM 104 or 204		3
CHEM 105 or 205		1
GEOL 107		4
General Education course or Composition I		3
		<b>15</b>

### Total Hours 15

<b>Second Year</b>		
<b>First Semester</b>		<b>Hours</b>
MATH 220 or 221		4
Technical Geology or non Geology course		3
Technical non Geology course		3
General Education course		3
General Education course		3
		<b>16</b>

### Total Hours 16

<b>Second Year</b>		
<b>Second Semester</b>		<b>Hours</b>
GEOL 401		4
Technical Geology course		3
GEOL 470		4
MATH 231		3
General Education course		3
		<b>17</b>

### Total Hours 17

<b>Third Year</b>		
<b>First Semester</b>		<b>Hours</b>
GEOL 380		4
MATH 241		4
PHYS 211 or 101		4
Technical Geology course		3
		<b>15</b>

### Total Hours 15

**Third Year**

<b>Second Semester</b>	<b>Hours</b>
Technical non Geology course	3
Technical Geology course	3
PHYS 212 or 102	5
Free Elective course	3
	<b>14</b>

**Total Hours 14****Fourth Year**

<b>First Semester</b>	<b>Hours</b>
Technical Geology or non Geology course	3
CPSC 440 or STAT 400	4
GEOL 451 or 452	4
General Education course	3
Free Elective course	3
	<b>17</b>

**Total Hours 17****Fourth Year**

<b>Second Semester</b>	<b>Hours</b>
Technical non Geology course	3
General Education course	3
General Education course	3
General Education course	3
Free Elective course	4
	<b>16</b>

**Total Hours 16****Total Hours: 126**

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1. Students will develop cross-disciplinary skills of observation, data collection, and spatial display of data (e.g., map making) related to geological materials, features, and processes. Upon completing this program, students will be able to analyze the Earth as a complex system and evaluate the interconnectedness of Earth systems and their effects on each other. Students will be able to analyze the causes and impacts of the Earth's changing climate over various time scales and evaluate the environmental, social, and geological impacts of these changes. Students will be able to analyze complex geological processes and their interconnectedness with environmental systems on geologic and real timescales, applying spatial analyses in 3D (and 4D), using direct field observations coupled with geologic interpretation and synthesis.
2. Students will develop an understanding of the physical, chemical, and mathematical theories fundamental to Earth processes through rigorous coursework and research. Upon program completion, students will be able to analyze and solve mathematical and computational problems encountered in geoscience research and professional practice. Students will be able to analyze and interpret geologic structure including geologic timescales, and tectonic and deformation processes and their hazard potentials. Students will be

able to interpret the chemical and mechanical processes involved within each stage of the rock cycle. Students will be able to recognize key surface processes and their connection to geological features, including potential hazards. Students will be able to analyze and interpret the chemical and mechanical processes involved in the Water Cycle and evaluate water as a critical natural resource.

3. Students will develop and apply critical thinking skills to synthesize principles learned in the classroom and data collected in the laboratory and in the field in order to evaluate hypotheses and solve geological and Earth science problems. Upon completion of this program, students will be able to carry out geological data collection and analysis in the field and/or lab, in independent and team working environments. Students will have the strong critical thinking and problem-solving skills needed to effectively analyzing and solving complex geologic problems. They will be able to navigate non-unique answers and make informed decisions based on evidence.
4. Students will demonstrate the ability to effectively communicate scientific data, interpretations, and hypotheses through written and oral methods. Upon completion, Students will be proficient in communicating science verbally and in writing and be able to tailor their written and verbal communication to different audiences. Students will have developed good listening skills and the ability to carry on an interactive dialogue with their colleagues.
5. Students will hone and apply interpersonal skills in a professional setting through group work, research activities, and field studies. Upon completing this program, students will be able to work in professional and academic group settings as productive members of a team to solve complex geologic and Earth science problems.

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## Department of Earth Science & Environmental Change (<https://esec.illinois.edu/>)

Geology website (<https://www.geology.illinois.edu/undergraduate/>)  
geology@illinois.edu

Geology Faculty (<https://www.geology.illinois.edu/cms/One.aspx?portalId=127672&pageId=225782>)

### Advising

Geology advising (<https://www.geology.illinois.edu/cms/One.aspx?portalId=127672&pageId=258530>)

## College of Liberal Arts & Sciences

LAS College website (<https://las.illinois.edu/>)

### Admissions

Liberal Arts & Sciences Admissions & Requirements (<http://catalog.illinois.edu/schools/las/academic-units/>)

University of Illinois Urbana-Champaign Undergrad Admissions (<https://www.admissions.illinois.edu/>)