Geology-Biology

Geology-Biology involves study of the interactions of the Earth and its hydrosphere and atmosphere with the great diversity of life forms, and how they have evolved and influenced over the entire history of the Earth. Many courses emphasize climate and biogeochemistry; this concentration is a good one for students interested in quantitative approaches to environmental science. Students take a basic suite of geoscience courses and at least 4 bio courses of their choosing, plus some supporting math and science courses; the AB degree requires a total of 14 courses and the ScB degree requires a total of 19, including one semester of research. There is a strong emphasis on active and collaborative learning, and on practice in communication. There are many opportunities for students to do research work (typically in paid positions) during the academic year or in the summer, in areas such as determining the history of climate change during the recent ice age, investigating the causes of major extinctions, and using paleoenvironmental records to determine the vulnerability of different regions of the globe to droughts and other processes that strongly affect society.

**Standard program for the A.B. degree**

This program provides a broad introduction to the geologic and biologic processes that shape the Earth and our environment. It is recommended for students seeking a liberal education and a general understanding of Earth processes, including the evolution of climate and the environment, global environmental change and Earth history. The program prepares students for careers in environmental science, geology, ecology, oceanography, and global change.

### Basic supporting science courses

- **BIOL 0200** The Foundation of Living Systems (or more advanced) 1
- **CHEM 0330** Equilibrium, Rate, and Structure (or advanced placement) 1

Select two courses in mathematics and/or physics at the level of:

- **MATH 0090** Introductory Calculus, Part I (or more advanced) 2
- **PHYS 0050** Foundations of Mechanics (or more advanced) 1
- **ENGN 0030** Introduction to Engineering (or more advanced, or courses in data analysis and statistics) 1

### Concentration courses

- **GEOL 0220** Physical Processes in Geology 1
- **GEOL 0230** Geochemistry: Earth and Planetary Materials and Processes 1
- **GEOL 0240** Earth: Evolution of a Habitable Planet 1
- **GEOL 1240** Stratigraphy and Sedimentation 1

Select three Biology courses from the following:

- **BIOL 0390** Vertebrate Evolution and Diversity 3
- **BIOL 0410** Invertebrate Zoology 3
- **BIOL 0415** Microbes in the Environment 3
- **BIOL 0420** Principles of Ecology 3
- **BIOL 0430** The Evolution of Plant Diversity 3
- **BIOL 0440** Inquiry in Plant Biology: Analysis of Plant Growth, Reproduction and Adaptive Responses 3
- **BIOL 0480** Evolutionary Biology 3
- **BIOL 1470** Conservation Biology 3
- **BIOL 1480** Terrestrial Biogeochemistry and the Functioning of Ecosystems 3
- **BIOL 1500** Plant Physiological Ecology 3
- **BIOL 1880** Comparative Biology of the Vertebrates 3

Total Credits: 14

### Standard program for the Sc.B. degree

This program is recommended for students interested in graduate study and careers in the Earth, Environmental, or Biological Sciences. It is relevant for students interested in environmental science, paleoclimate, Earth systems science, biogeochemistry, oceanography, or paleobiology.

### Five basic supporting science courses

- **BIOL 0200** The Foundation of Living Systems (or more advanced) 1
- **CHEM 0330** Equilibrium, Rate, and Structure (or advanced placement) 1
- **PHYS 0050** Foundations of Mechanics (or more advanced) 1
- **ENGN 0030** Introduction to Engineering 1

Select two courses in mathematics at the level of:

- **MATH 0090** Introductory Calculus, Part I 2
- **MATH 0100** Introductory Calculus, Part II (or more advanced, or advanced courses in data analysis) 1

### Fourteen (14) concentration courses

- **GEOL 0220** Physical Processes in Geology 1
- **GEOL 0230** Geochemistry: Earth and Planetary Materials and Processes 1
- **GEOL 0240** Earth: Evolution of a Habitable Planet 1
- **GEOL 1240** Stratigraphy and Sedimentation 1

Select three biology courses from the following:

- **BIOL 0390** Vertebrate Evolution and Diversity 3
- **BIOL 0410** Invertebrate Zoology 3
- **BIOL 0415** Microbes in the Environment 3
- **BIOL 0420** Principles of Ecology 3
- **BIOL 0430** The Evolution of Plant Diversity 3
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- **BIOL 1480** Terrestrial Biogeochemistry and the Functioning of Ecosystems 3
- **BIOL 1500** Plant Physiological Ecology 3
- **BIOL 1880** Comparative Biology of the Vertebrates 3

Select three geological sciences courses from the following:

- **GEOL 0580** Foundations of Physical Hydrology 3
- **GEOL 1110** Estuarine Oceanography 3
- **GEOL 1120** Paleoceanography 3
- **GEOL 1130** Ocean Biogeochemical Cycles 3
- **GEOL 1150** Limnology: The Study of Lakes 3
- **GEOL 1330** Global Environmental Remote Sensing 3
- **GEOL 1370** Environmental Geochemistry 3
- **GEOL 1380** Environmental Stable Isotopes 3
- **GEOL 1510** Introduction to Atmospheric Dynamics 3

Total Credits: 14
Three additional courses from upper level geological sciences, mathematics, or supporting sciences with approval from the concentration advisor.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOL 1970</td>
<td>Individual Study of Geologic Problems (Senior Research Thesis)</td>
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Total Credits 19
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Helvetica was used instead of Arial.

The editor may contact Leepfrog for a draft with the correct fonts in place.