

# Earth, Climate, and Biology

Students in Earth, Climate and Biology apply principles from Earth science, biology, chemistry, and physics to understand how major components of the Earth system, such as its atmosphere and oceans, interact with and sustain life over time. Many courses emphasize climate change, environmental quality, and biogeochemistry, so this concentration is a good match for students interested in studying the environment. Courses also investigate Earth history, including past climate, extinction events, and using the Earth's sedimentary record to investigate environmental change.

Both A.B. and Sc.B. degrees are offered, requiring 12 and 19 courses, respectively. These degrees build skills in critical thinking, data analysis and modeling, finding solutions to complex problems, and written and oral communication. DEEPS provides a highly collaborative learning environment that emphasizes process-oriented, hands-on approaches in the classroom, in labs and on field trips. There are many opportunities for students to do paid research during the summer or academic year.

Students interested in this concentration may also wish to consider related concentrations: Geochemistry and Environmental Chemistry, Geophysics and Climate Physics, and Earth and Planetary Science.

## 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 to combine diverse educational interests with 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, geoscience, ecology, oceanography, and global change. Some course requirements may be flexible based on consultation with the concentration advisor.

**Note - For students still enrolled with the prior Concentration in Geology-Biology A.B., please refer to the Archived Bulletin link on left hand navigation for your requirements for the year you declared.**

### Basic supporting science courses

BIOL 0200	The Foundation of Living Systems (or equivalent)	1
or BIOL 0210	Diversity of Life	
CHEM 0330	Equilibrium, Rate, and Structure (or equivalent)	1
A course to build quantitative skills:		1
MATH 0090	Single Variable Calculus, Part I (or higher)	
BIOL 0495	Statistical Analysis of Biological Data	
or APMA 1650	Introduction to Probability and Statistics with Calculus	
CSCI 0111	Computing Foundations: Data (or higher)	
ENGN 0040	Engineering Statics and Dynamics (or higher)	
PHYS 0050	Foundations of Mechanics (or higher)	
APMA 0350	Applied Ordinary Differential Equations (or higher)	

### Nine Concentration courses

Two of these four fundamentals courses:		2
EEPS 0220	Understanding Earth and Environmental Processes	
EEPS 0230	Geochemistry: Earth and Planetary Materials and Processes	
EEPS 0240	Earth: Evolution of a Habitable Planet	

EEPS 0250	Computational Approaches to Modelling and Quantitative Analysis in Natural Sciences: An Introduction	
EEPS 1240	Stratigraphy and Sedimentation	1
Select three upper level Biology courses such as:		3
BIOL 0410	Invertebrate Zoology	
BIOL 0420	Principles of Ecology	
BIOL 0430	The Evolution of Plant Diversity	
BIOL 0480	Evolutionary Biology	
BIOL 1470	Conservation Biology	
Three EEPS courses such as:		3
One of EEPS 0220, EEPS 0230, EEPS 0240, or EEPS 0250 if not already taken		
EEPS 0850	Weather and Climate	
EEPS 1120	Paleoceanography	
EEPS 1130	Ocean Biogeochemical Cycles	
EEPS 1150	Limnology: The Study of Lakes	
EEPS 1310	Global Water Cycle	
EEPS 1320	Introduction to Geographic Information Systems for Environmental Applications	
EEPS 1370	Environmental Geochemistry	
EEPS 1615	Climate Change, Human Rights, and the Policy Process	
EEPS 1970	Individual Study of Geologic Problems	

**Total Credits** 12

## Standard program for the Sc.B. degree

This program is recommended for students interested in more in-depth study in the Earth, environmental, or biological sciences, potentially including graduate school and diverse careers in these areas. It is relevant for students interested in environmental science, paleoclimate, Earth systems science, biogeochemistry, oceanography, or paleobiology. Some course requirements may be flexible based on consultation with the concentration advisor.

**Note - For students still enrolled with the prior Concentration in Geology-Biology Sc.B., please refer to the Archived Bulletin link on left hand navigation for your requirements for the year you declared.**

### Five supporting science courses:

BIOL 0200	The Foundation of Living Systems (or equivalent)	1
or BIOL 0210	Diversity of Life	
CHEM 0330	Equilibrium, Rate, and Structure (or equivalent)	1
Three courses to build quantitative skills:		3
MATH 0090	Single Variable Calculus, Part I (or higher)	
BIOL 0495	Statistical Analysis of Biological Data	
or APMA 1650	Introduction to Probability and Statistics with Calculus	
CSCI 0111	Computing Foundations: Data (or higher)	
ENGN 0040	Engineering Statics and Dynamics (or higher)	
APMA 0350	Applied Ordinary Differential Equations (or higher)	
PHYS 0050	Foundations of Mechanics (or higher)	

### Fourteen concentration courses:

EEPS 0220	Understanding Earth and Environmental Processes	1
EEPS 0240	Earth: Evolution of a Habitable Planet	1
EEPS 0230	Geochemistry: Earth and Planetary Materials and Processes	1

or EEPS 0250	Computational Approaches to Modelling and Quantitative Analysis in Natural Sciences: An Introduction	
EEPS 1240	Stratigraphy and Sedimentation	1
Three upper level Biology courses such as:		3
BIOL 0410	Invertebrate Zoology	
BIOL 0420	Principles of Ecology	
BIOL 0430	The Evolution of Plant Diversity	
BIOL 0480	Evolutionary Biology	
BIOL 1470	Conservation Biology	
Three upper level EEPS courses such as:		3
EEPS 0850	Weather and Climate	
EEPS 1120	Paleoceanography	
EEPS 1130	Ocean Biogeochemical Cycles	
EEPS 1150	Limnology: The Study of Lakes	
EEPS 1310	Global Water Cycle	
EEPS 1320	Introduction to Geographic Information Systems for Environmental Applications	
EEPS 1330	Global Environmental Remote Sensing	
EEPS 1370	Environmental Geochemistry	
EEPS 1430	Principles of Planetary Climate	
EEPS 1615	Climate Change, Human Rights, and the Policy Process	
Three upper level science or math courses with approval from the concentration advisor		3
EEPS 1970	Individual Study of Geologic Problems (Senior Research Thesis)	1
<b>Total Credits</b>		<b>19</b>