

EARTH SCIENCES MAJOR (B.S.)

<https://ceps.unh.edu/earth-sciences/earth-sciences-bs>

Description

The bachelor of science in Earth sciences is offered through the Department of Earth Sciences. The program represents a strong concentration in the Earth sciences and is especially well-suited for students who plan to continue their studies in graduate school. Beyond a central core of courses, there are several possible specializations (climate, geology, geophysics, oceanography, petroleum geology) from which students must choose in order to develop depth in a particular area of Earth sciences. Students are encouraged to attend a summer off-campus field experience, for which scholarship funds may be available.

Requirements

Code	Title	Credits
Requirements		
Satisfy the Discovery Program requirements and the bachelor of science degree requirements		
MATH 425	Calculus I ¹	4
MATH 426	Calculus II	4
CHEM 403	General Chemistry I ^{1,2}	4
CHEM 404	General Chemistry II ^{1,2}	4
PHYS 407	General Physics I ¹	4
PHYS 408	General Physics II ¹	4
Core Curriculum		
ESCI 401 or ESCI 409	Dynamic Earth Geology and the Environment	4
ESCI 402	Earth History	4
ESCI 501	Introduction to Oceanography	4
ESCI 512	Principles of Mineralogy	4
ESCI 530 or ESCI 534	Geological Field Methods ³ Techniques in Environmental Sciences	4
Select one of the following:		
ESCI 654	Fate and Transport in the Environment	4
ESCI 701	Quantitative Methods in Earth Sciences ⁴	4
ESCI #731	Geodynamics	4
Specializations		
Select one of the following approved specializations:		
Climate		
Geology		
Geophysics		
Oceanography		
Petroleum Geology		
Science/Math Electives		
Complete three additional approved science/math electives (required for all approved specialization except Petroleum Geology) ⁵		
Capstone		

Complete the capstone requirement

Total Credits 48

- ¹ Some of these courses may also satisfy Discovery Program requirements.
- ² Or CHEM 405 Chemical Principles for Engineers if applicable
- ³ ESCI 530 Geological Field Methods is required for the geology, geophysics and petroleum geology specializations
- ⁴ Geophysics track must select ESCI 701 Quantitative Methods in Earth Sciences
- ⁵ The following should be considered: additional 700-level Earth sciences courses; additional chemistry, mathematics, and physics courses; courses in computer science, engineering, and the biological sciences; and an off-campus field camp.

Specializations

Climate

Code	Title	Credits
ESCI 514	Introduction to Climate	3
ESCI 561	Landscape Evolution	4
Select at least two of the following:		6-7
ESCI 758	Introductory Physical Oceanography	
ESCI 760	Paleoceanography	
ESCI 762	Glacial Geology	
ESCI 765	Paleoclimatology	
Select three advanced-level approved electives		9-12
Total Credits		22-26

Geology

Code	Title	Credits
ESCI 561	Landscape Evolution	4
ESCI 614	Introduction to Petrology	4
ESCI 631	Structural Geology	4
ESCI 652	Paleontology	4
Two approved 700-level electives		6-8
Total Credits		22-24

Geophysics

Code	Title	Credits
MATH 527	Differential Equations with Linear Algebra	4
MATH 528	Multidimensional Calculus	4
ESCI 561 or ESCI 614	Landscape Evolution Introduction to Petrology	4
ESCI 631	Structural Geology	4
Select at least two of the following:		8
ESCI #731	Geodynamics	
ESCI 734	Geophysics	
ESCI #735	Earthquakes and Faulting	
ESCI 756	Geotectonics	
ESCI 759	Geological Oceanography	
One approved 700-level elective		3-4
Total Credits		27-28

Oceanography

Code	Title	Credits
BIOL 411	Introductory Biology: Molecular and Cellular	4
ESCI 514	Introduction to Climate	3
Select at least three of the following:		10-11
ESCI 750	Biological Oceanography	
ESCI 752	Chemical Oceanography	
ESCI 758	Introductory Physical Oceanography	
ESCI 759	Geological Oceanography	
Complete three advanced-level approved electives		9-12
Total Credits		26-30

Petroleum Geology

Code	Title	Credits
ESCI 614	Introduction to Petrology	4
ESCI 631	Structural Geology	4
ESCI 652	Paleontology	4
ESCI 734	Geophysics	4
ESCI 741	Geochemistry	4
ESCI 754	Sedimentology	4
ESCI 756	Geotectonics	3
ESCI 759	Geological Oceanography	4
ESCI 796	Topics (Petroleum Geology)	4
CHE 705	Fossil Fuels and Renewable Energy Sources	4
Total Credits		39

Capstone Experience

A capstone experience is required of all undergraduate Earth sciences majors during their senior year. All capstone experiences at UNH must meet one or more of the following criteria:

1. The capstone synthesizes and applies disciplinary knowledge and skills.
2. The capstone fosters reflection on undergraduate learning and experience.
3. The capstone demonstrates emerging professional competencies.
4. The capstone applies, analyzes, and/or interprets research or data or artistic expression.
5. The capstone explores areas of interest based on the integration of prior learning.

Examples of Department of Earth Sciences capstone experiences include Senior Thesis (ESCI 799 Senior Thesis), UROP/SURF projects, environmental or geologic field camps, or Earth sciences education and outreach activities. Additional experiences may qualify (e.g., ESCI 795 Topics/ESCI 796 Topics field courses, INCO 590 Student Research Experience, INCO 790 Advanced Research Experience, internships) if they are designed according to the above criteria. Students should work closely with their advisers to define the most appropriate capstone experience for the Earth sciences degree option and all capstone experiences must be approved by the Department of Earth Sciences undergraduate coordinator. Presentation of projects or experiences developed for the capstone is encouraged at the annual UNH Undergraduate Research Conference or other appropriate venue.