

# EARTH SCIENCES MAJOR (B.A.)

<https://ceps.unh.edu/earth-sciences/program/ba/earth-sciences-major>

## Description

The Bachelor of Arts degree in the Department of Earth Sciences provides students an opportunity to obtain a broad education and a general background in the Earth sciences with a greater degree of freedom in choosing electives than in the B.S. degree programs. Through careful choice of electives, students can prepare for business, industry, public service, the non-profit sector, graduate school or, in combination with a M.Ed. or M.A.T. certification program, a career teaching in secondary schools.

## Requirements

### Degree Requirements

**Minimum Credit Requirement:** 128 credits

**Minimum Residency Requirement:** 32 credits must be taken at UNH

**Minimum GPA:** 2.0 required for conferral\*

**Core Curriculum Required:** Discovery & Writing Program Requirements

**Foreign Language Requirement:** Yes

All Major, Option and Elective Requirements as indicated.

\*Major GPA requirements as indicated.

### Major Requirements

A minimum grade of C- is required in major coursework.

Code	Title	Credits
<b>Required Courses</b>		
ESCI 401	Dynamic Earth	4
or ESCI 409	Geology and the Environment	
ESCI 402	Earth History	4
ESCI 512	Principles of Mineralogy	4
ESCI 690	Capstone & Professional Development	1
CHEM 403	General Chemistry I	4
Five advanced-level courses, two of which must be 700-level or above		15-20
<b>Math Requirements</b>		
MATH 425	Calculus I	4
MATH 426	Calculus II	4
or MATH 539	Introduction to Statistical Analysis	
or BIOL 528	Applied Biostatistics I	
<b>Capstone Experience</b>		
<b>Total Credits</b>		<b>40-45</b>

<sup>1</sup> Note that ESCI 401 Dynamic Earth, ESCI 402 Earth History, ESCI 405 Global Environmental Change, ESCI 409 Geology and the Environment, ESCI 420 Our Solar System, ESCI 501 Introduction to Oceanography cannot be taken to fulfill Discovery Program requirements for majors in the Department of Earth Sciences.

It is strongly advised that students complete, as early as possible, a year each of college chemistry and physics.

## 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.

Suggested ways of meeting the capstone requirement in the Department of Earth Sciences include approved INCO 790 Advanced Research Experience, ESCI 795 Topics/ESCI 796 Topics field courses, ESCI 799 Senior Thesis, URA/SURF/IROP projects, internships, environmental/geologic field camps, REU programs, or Earth Sciences education and outreach activities designed according to the above criteria. Capstone experiences must be equivalent to a minimum of 2 academic credits. Students should work closely with their faculty advisors to define the most appropriate capstone experience for their Earth Sciences degree program, although the capstone mentor can be someone other than their primary faculty advisor. All capstone experiences must be approved and certified by the faculty advisor and the capstone mentor. Presentation of projects or experiences developed for the capstone is encouraged at the annual UNH Undergraduate Research Conference or other appropriate venue.

### B.A. Foreign Language Requirement

The foreign language requirement may be fulfilled by a full year (8 UNH credits or equivalent) elementary course in any foreign language including American Sign Language, 1 semester (4 UNH credits or equivalent) of any foreign language beyond the elementary level, or by taking a College Board foreign language achievement test.

## Degree Plan

### Sample Degree Plan

*This sample degree plan serves as a general guide; students collaborate with their academic advisor to develop a personalized degree plan to meet their academic goals and program requirements.*

#### First Year

Fall		Credits
ESCI 400	Freshman Field Seminar	1
ESCI 401	Dynamic Earth	4
MATH 425	Calculus I	4
CHEM 403	General Chemistry I	4
ENGL 401	First-Year Writing	4
<b>Credits</b>		<b>17</b>

#### Spring

ESCI 402	Earth History	4
----------	---------------	---

MATH 426	Calculus II	4
or MATH 439	or Statistical Discovery for Everyone	
or BIOL 528	or Applied Biostatistics I	
Math/Science elective <sup>2</sup>		
Inquiry Discovery Course <sup>1</sup>		4
<b>Credits</b>		<b>12</b>
<b>Second Year</b>		
<b>Fall</b>		
ESCI 5/6__ (number > 512)		4
ESCI 5/6__ (number > 512)		
Discovery Course <sup>1</sup>		4
Foreign Language <sup>3</sup>		4
<b>Credits</b>		<b>12</b>
<b>Spring</b>		
ESCI 512	Principles of Mineralogy	4
Discovery Course <sup>1</sup>		4
Foreign Language <sup>3</sup>		4
Discovery Course <sup>1</sup>		4
<b>Credits</b>		<b>16</b>
<b>Third Year</b>		
<b>Fall</b>		
ESCI 5/6/7__ (number > 512)		4
Math/Science elective <sup>2</sup>		
Free Elective <sup>4</sup>		4
Discovery Course <sup>1</sup>		4
<b>Credits</b>		<b>12</b>
<b>Spring</b>		
Math/Science elective <sup>2</sup>		
ESCI 690	Capstone & Professional Development	1
ESCI 6__		4
Free Elective <sup>3</sup>		4
Discovery Course <sup>1</sup>		4
<b>Credits</b>		<b>13</b>
<b>Fourth Year</b>		
<b>Fall</b>		
ESCI 7__		4
Free Elective <sup>4</sup>		4
Free Elective <sup>4</sup>		4
Discovery Course <sup>1</sup>		4
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
ESCI 7__		4
Free Elective <sup>4</sup>		4
Free Elective <sup>4</sup>		4
Senior Capstone		4
<b>Credits</b>		<b>16</b>
<b>Total Credits</b>		<b>114</b>

- <sup>2</sup> Three math/science electives must be approved in consultation with departmental advisor. These are typically in the fields of mathematics, chemistry, physics, and biology. Students considering graduate school or licensure as a Professional Geologist should take MATH 426 Calculus II, CHEM 404 General Chemistry II, along with either PHYS 407 General Physics I and PHYS 408 General Physics II, or BIOL 411 Introductory Biology: Molecular and Cellular and BIOL 412 Introductory Biology: Evolution, Biodiversity and Ecology.
- <sup>3</sup> The foreign language requirement may be fulfilled by a full year (8 UNH credits or equivalent) elementary course in any foreign language including American Sign Language, 1 semester (4 UNH credits or equivalent) of any foreign language beyond the elementary level, or by taking a College Board foreign language achievement test.
- <sup>4</sup> Students should consider additional courses in Earth Sciences and other science and math courses.

## Student Learning Outcomes

### Program Learning Outcomes Students will be able to:

- Recognize common Earth materials and structures.
- Describe how Earth scientists construct the geological time scale and apply geochronologic dating techniques.
- Describe the broad attributes of and interactions within the Earth System, as well as its geological history, how and why it is changing today, and how those changes impact society.
- Understand Earth processes and cycles.
- Perform simple calculations to process and evaluate quantitative Earth science data.
- Interpret a geologic map and cross section in terms of the sequence of geologic events and understand the processes that caused those events.
- Collect, interpret, and synthesize basic field observations and measurements to develop and test multiple working hypotheses to explain them.
- Become proficient in basic geological and Earth science laboratory skills.
- Describe the basic dynamics governing the evolution of the Earth's climate.
- Successfully apply basic calculus and chemistry to Earth science problems.
- Effectively communicate results of scientific inquiries orally, visually, and in writing.

<sup>1</sup> One course must be taken in each of the remaining Disciplinary Groups of the University Discovery Program (Biological Sciences; Environment Technology & Society; Historical Perspectives; World Culture; Fine & Performing Arts; Social Science; Humanities).