EARTH AND ENVIRONMENTAL SCIENCES MAJOR (B.A.)

https://www.unh.edu/program/bachelor-arts/earth-sciences

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. programs. This B.A. degree nicely complements other majors and minors and by careful choice of electives, students can prepare for graduate or professional school and careers in education, resource management and sustainability, environmental consulting, government, business, the non-profit sector, and public service.

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
Required Courses [1]		
ESCI 401	Dynamic Earth	4
or ESCI 409	Geology and the Environment	
ESCI 402	Earth History	4
or ESCI 501	Introduction to Oceanography	
or ESCI 405	Global Environmental Change	
or ESCI 420	Our Solar System	
or NR 403	Introduction to Environmental Science	
ESCI 512	Principles of Mineralogy	4
or NR 501	Studio Soils	
ESCI 561	Landscape Evolution	4
Advanced Level Courses		
Select three ESCI courses		9-12
ESCI courses must be numbered 514 or higher and two courses must be at the 700-level. [2]		
Select one additional course [3]		3-4
Mathematics and Science Courses [4]		
MATH 425	Calculus I	4
or MATH 424B	Calculus for Life Sciences	
MATH 426	Calculus II	4
or MATH 539	Introduction to Statistical Analysis	
or BIOL 528	Applied Biostatistics I	
or CS 457	Introduction to Data Science and Analytics	
CHEM 403	General Chemistry I	4
Elective Courses		
Select free electives to complete a total of 128 credits. [5]		28
Professional Development		
ESCI 400	First-year Experience	1
ESCI 690	Capstone & Professional Development	1
Capstone Experience		
See below list of suggested capstone experiences		
Total Credits		**70-74**

1. The following courses cannot be taken to fulfill Discovery Program requirements for majors in the Department of Earth Science: ESCI 401, ESCI 402, ESCI 405, ESCI 409, ESCI 420, ESCI 501.
2. Recommended Earth Sciences courses include ESCI 530 Geological Field Methods or ESCI 534 Techniques in Environmental Sciences.
3. ESCI course numbered at/above 514, or NR course numbered at/above 501, or GEOG 560, GEOG 572, GEOG 574, GEOG 670.
4. Other recommended science courses include: CHEM 404, PHYS 407 & PHYS 408 or PHYS 401 & PHYS 402, second semester Biology BIOL 411 or BIOL 412.
5. A minor, second or dual major, additional foundational or Earth Sciences courses should be considered.

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 Proficiency Requirement

The Bachelor of Arts degree requires proficiency in a foreign language. This requirement may be fulfilled by completing the equivalent of a full-year elementary-level course in a language not previously studied, or by completing the equivalent of a semester of a course in a foreign

language at the intermediate or higher level, or by earning credit through an approved Advanced Placement or College Board foreign language achievement test (minimum scores vary). The proficiency in a foreign language requirement must be satisfied by the end of the sophomore year. No credit is awarded for elementary year college coursework if the student has had two or more years of that language in high school. It is strongly advised that students check with academic departments or academic centers to identify department-advised specific foreign language proficiency options.

A Student with a documented disability who wishes accommodation on the basis that the disability will prevent them from successfully mastering a foreign language requirement, or whose foreign language requirement was waived in high school because of a documented disability, must contact Student Accessibility Services, Smith Hall, (603) 862-2607 (Voice/TDD).

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	First-year Experience	1
ESCI 401 or ESCI 409	Dynamic Earth or Geology and the Environment	4
MATH 425	Calculus I	4
CHEM 403	General Chemistry I	4
ENGL 401	First-Year Writing (or transfer or AP credit)	4
	Credits	**17**
Spring		
ESCI 402 or ESCI 405 or ESCI 420 or ESCI 501 or NR 403	Earth History or Global Environmental Change or Our Solar System or Introduction to Oceanography or Introduction to Environmental Science	4
MATH 426 or MATH 539 or BIOL 528 or CS 457	Calculus II or Introduction to Statistical Analysis or Applied Biostatistics I or Introduction to Data Science and Analytics	4
CHEM 404	General Chemistry II (strongly recommended science elective)	4
Inquiry Discovery Course [1]		4
	Credits	**16**
Second Year		
Fall		
ESCI 561	Landscape Evolution	4
ESCI ___		3-4
Foreign Language [3]		4
BIOL 41X		4
	Credits	**15-16**
Spring		
ESCI 512 or NR 501	Principles of Mineralogy or Studio Soils	4
Discovery Course [1]		4
Foreign Language [3]		4
Discovery Course [1]		4
	Credits	**16**
Third Year		
Fall		
PHYS 407	General Physics I (or 2nd major/minor or PHYS 401 strongly recommended)	4
ESCI ___ (number >512)		3-4
Open Elective [4]		4
Discovery Course [1]		4
	Credits	**15-16**
Spring		
ESCI 690	Capstone & Professional Development	1
PHYS 408 or PHYS 402 or BIOL 412	General Physics II (recommended science elective) or Introduction to Physics II or Introductory Biology: Evolution, Biodiversity and Ecology	4
Open Elective [4]		4
Open Elective [4]		4
Discovery Course [1]		4
	Credits	**17**
Fourth Year		
Fall		
ESCI 7__		4
Open Elective [4]		4
Open Elective [4]		4
Discovery Course [1]		4
	Credits	**16**
Spring		
ESCI 7__		4
Open Elective [4]		4
Open Elective [4]		4
Senior Capstone		4
	Credits	**16**
	Total Credits	**128-130**

1. 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).
2. 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.
3. The Bachelor of Arts degree requires proficiency in a foreign language. This requirement may be fulfilled by completing the equivalent of a full-

year elementary-level course in a language not previously studied, or by completing the equivalent of a semester of a course in a foreign language at the intermediate or higher level, or by earning credit through an approved Advanced Placement or College Board foreign language achievement test (minimum scores vary). The proficiency in a foreign language requirement must be satisfied by the end of the sophomore year. No credit is awarded for elementary year college coursework if the student has had two or more years of that language in high school. It is strongly advised that students check with academic departments or academic centers to identify department-advised specific foreign language proficiency options.
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[4] Students should consider additional courses in Earth Sciences and other science and math courses.

Student Learning Outcomes

Program Learning Outcomes

Students graduating with a B.A. in Earth and Environmental Sciences should achieve the following learning outcomes:

- Demonstrate a broad understanding of Earth systems and their interactions, as well as their geologic and climatic history, how and why these are changing today, and how these changes impact society.
- Recognize and understand common Earth materials, geologic structures, dynamics, processes, and cycles.
- Perform calculations and apply computational methods to process and evaluate a range of quantitative Earth and environmental science data.
- Become proficient in basic geological and Earth science laboratory and field techniques.
- Effectively communicate results of scientific inquiries orally, visually, and in writing.