Ecology and Evolutionary Biology, BS (Boston)

The Bachelor of Science in Ecology and Evolutionary Biology degree is designed to provide a strong foundation in the fundamentals of ecology and evolutionary biology, including focal points in population, community, and ecosystem ecology; evolutionary ecology and biology; conservation biology; population genetics; behavior; and ecological and evolutionary genomics. Our major provides unique experiential learning opportunities for students interested in the fundamentals of evolution; the ecology of terrestrial, marine, and freshwater systems; and the application of both of these in the pursuit of the conservation and restoration of natural systems. Further, students in our major have the opportunity to focus on cutting-edge techniques in the use of molecular tools to answer fundamental questions in ecology and evolution. The interdisciplinary nature of our major fosters critical thinking and creativity in scientific problem solving while instilling skills that will result in scientifically literate global citizens. The curriculum for this major also satisfies premed and prevet requirements. Courses offered by this major fulfill several core competencies required by Northeastern University: Engaging with the Natural and Designed World, Exploring Created Expression and Innovation, Conducting Formal and Quantitative Reasoning, Analyzing and Using Data, Employing Ethical Reasoning, writing-intensive courses, and capstone.

Fieldwork is a valued component of training in our programs, and several of our courses use field sites, resources, and facilities of the Marine Science Center and throughout the greater Boston area. Students interested in having a foundational education in ecology and evolutionary biology, and also participating in the Northeastern Three Seas Program, will be able to meet the requirements for both programs. All students will also have the option to complete undergraduate research experiences with faculty members in the Department of Marine and Environmental Sciences and can take advantage of our faculty networks of scientists and practitioners for additional co-op and research opportunities.

Students graduating with an EEB major will be prepared for success in pursuing graduate degrees; for working in multiple areas of science and technology, including data science and biotech sectors; and for positions with consulting companies, nonprofits, and government agencies.

Ecology and evolutionary biology majors and associated combined majors cannot be combined with majors in biology, marine biology, or environmental and sustainability sciences, nor can those students minor in biology, marine science, or environmental and sustainability sciences.

Program Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (https://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (https://catalog.northeastern.edu/undergraduate/university-academics/nupath/).

Due to overlap in course content, double majoring in ecology and evolutionary biology and marine biology is not permitted.

Ecology and Evolutionary Biology Major Requirements

Code	Title	Hours
Ecology and Evolutionary Biology		
EEMB 1101 and EEMB 1102	Foundations in Ecology and Evolutionary Biology and Lab for EEMB 1101	5
Ecology and Evolutionary Genomics		
EEMB 1105 and EEMB 1106	Foundations in Ecological and Evolutionary Genomics and Lab for EEMB 1105	5
Genetics		
BIOL 2301 and BIOL 2302	Genetics and Molecular Biology and Lab for BIOL 2301	5
Evolution		
EEMB 2400	Introduction to Evolution	4
Ecology		
EEMB 2302 and EEMB 2303	Ecology and Lab for EEMB 2302	5
Conservation		
EEMB 3460	Conservation Biology	4
Data Skills		

ENVR 1500 and ENVR 1501	Introduction to Environmental, Social, and Biological Data and Lab for ENVR 1500	5
Biostatistics		
ENVR 2500 and ENVR 2501	Biostatistics and Lab for ENVR 2500	5
Communication		
ENVR 4000	Science Communication and Professional Development	4
Capstone		
ENVR 4997	Senior Thesis	4
or ENVR 4971	Junior/Senior Honors Project 2	

Supporting Courses

Code	Title	Hours
Introduction to College		
INSC 1000	Science at Northeastern	1
Math		
Complete one of the following:		4
MATH 1241	Calculus 1	
MATH 1251	Calculus and Differential Equations for Biology 1	
MATH 1341	Calculus 1 for Science and Engineering	
Chemistry		
CHEM 1161 and CHEM 1162 and CHEM 1163	General Chemistry for Science Majors and Lab for CHEM 1161 and Recitation for CHEM 1161	5
Organic or Environmental Chemistry		
Complete one of the following:		4-5
CHEM 2311 and CHEM 2312	Organic Chemistry 1 and Lab for CHEM 2311	
ENVR 3410	Environmental Geochemistry	
ENVR 3435	Environmental Pollution: Fate and Transport	
ENVR 4504	Environmental Pollution	
Physics 1		
Complete one of the following:		5
PHYS 1145 and PHYS 1146	Physics for Life Sciences 1 and Lab for PHYS 1145	
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	
PHYS 1161 and PHYS 1162	Physics 1 and Lab for PHYS 1161	

Ecology and Evolutionary Biology Topical Requirement

Code	Title	Hours
Complete six of the following (at least one course must be taken from each list):		24
Evolution of Organisms		
BIOL 2327	Human Parasitology	
EEMB 2610	Plant Biology	
EEMB 2700 and EEMB 2701	Marine Biology and Lab for EEMB 2700	
EEMB 3250	Freshwater Ecology	
EEMB 3465	Ecological and Conservation Genomics	
EEMB 3475	Wildlife Ecology	
EEMB 3600	Animal Behavior	
EEMB 3700	Desert Ecology	
ENVR 3800 and ENVR 3801	Plants and Society and Lab for ENVR 3800	

Ecology and Conservation Biology	
EEMB 3455	Ecosystems Ecology
EEMB 3466	Disease Ecology
EEMB 3700	Desert Ecology
EEMB 4000	Applied Conservation Biology
EEMB 4001	Landscape and Restoration Ecology
ENVR 3125	Global Oceanic Change
ENVR 3150	Food Security and Sustainability
ENVR 4505	Wetlands
ENVR 5210	Environmental Planning
ENVR 5220	Ecosystem-Based Management
ENVR 5700	Streams and Watershed Ecology
ENVR 5750	Urban Ecology
Analytical Skills	
BIOL 3611 and BIOL 3612	Biochemistry and Lab for BIOL 3611
CHEM 2311 and CHEM 2312	Organic Chemistry 1 and Lab for CHEM 2311
CHEM 2313 and CHEM 2314	Organic Chemistry 2 and Lab for CHEM 2313
EEMB 5130	Population Dynamics
EEMB 5522	Experimental Design Marine Ecology
ENVR 3300 and ENVR 3301	Geographic Information Systems and Lab for ENVR 3300
ENVR 3410	Environmental Geochemistry
ENVR 5500	Advanced Biostatistics
ENVR 5563	Advanced Spatial Analysis
PHYS 1147 and PHYS 1148	Physics for Life Sciences 2 and Lab for PHYS 1147

Writing Requirements

Code	Title	Hours
ENGW 1111	First-Year Writing	4
or ENGW 1102	First-Year Writing for Multilingual Writers	
ENGW 3307	Advanced Writing in the Sciences	4
or ENGW 3303	Advanced Writing in the Environmental Professions	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Co-op Requirements

Code	Title	Hours
Students who want to participate in co-op will need to complete EESC 2000 Professional Development for Co-op.		
EESC 2000	Professional Development for Co-op	1

NUPath Requirements

The following NUPath requirements are fulfilled by required courses in this major:

- Engaging with the Natural and Designed World (ND)
- Conducting Formal and Quantitative Reasoning (FQ)
- Analyzing and Using Data (AD)
- Demonstrating Thought and Action in a Capstone (CE)
- Two Writing-Intensive Courses in the Disciplines (WI)

Other NUPath requirements may be fulfilled by electives in the major.

Science GPA Requirement (Ecology and Evolutionary Biology)

A minimum 2.000 GPA in the following course codes is required: EEMB, ENVR

Ecology and Evolutionary Biology Credit Requirement

Complete 88 semester hours in the major.

Program Requirement

128 total semester hours required

Plan of Study

Sample Plan of Study

FOUR YEARS, TWO SPRING CO-OPS

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
INSC 1000	1	EEMB 1105 and EEMB 1106	5	Vacation	0	General Elective	4
EEMB 1101 and EEMB 1102	5	CHEM 1161 and CHEM 1162 and CHEM 1163	5			NUPath Elective 2	4
ENVR 1500 and ENVR 1501	5	PHYS 1145 and PHYS 1146	5				
MATH 1241 or 1251	4	NUPath Elective 1	4				
ENGW 1111	4						
	19		**19**		**0**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
EESC 2000	1	Co-op	0	Co-op	0	General Elective	4
BIOL 2301 and BIOL 2302	5					NUPath Elective 3	4
CHEM 2311	4						
ENVR 2500 and ENVR 2501	5						
General Elective	4						
	19		**0**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
EEMB 2302 and EEMB 2303	5	Co-op	0	Co-op	0	NUPath Elective 4	4
EEMB 2400	4					ENGW 3307	4
EEB elective 1	4						
EEB elective 2	4						
	17		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours
EEMB 3460	4	ENVR 4000	4
EEB elective 3	4	ENVR 4997	4
EEB elective 4	4	EEB elective 5	4
NUPath Elective 5	4	EEB elective 6	4
	16		**16**

Total Hours: 130