Marine and Environmental Sciences, PhD

The PhD in Marine and Environmental Sciences (MES) program provides students with advanced course work and training in the concentration areas of marine sciences, geosciences, sustainability sciences, and ecology and evolutionary biology.

Students must pass three examinations during the course of their graduate studies:

1. An oral examination by the student's dissertation committee.
2. A proposal defense presented to the student's dissertation committee that explains the research areas that the student proposes to work in.
3. A defense of the student's written dissertation consisting of a public seminar, public question-and-answer period, and private defense of their work to their dissertation committee. Dissertation committees consist of at least four Northeastern faculty and one external faculty member.

A cumulative GPA of 3.000 is required for graduation. All PhD students are required to have at least two first-authored publications submitted to or accepted in a peer-reviewed journal prior to their defense. The PhD will be awarded following submission of a dissertation, approved by the candidate's dissertation committee, to the College of Science.

Students who do not qualify for the doctoral degree, but who have completed required coursework with a cumulative GPA of 3.000 or better, may be eligible to receive a terminal MS Marine and Environmental Sciences *(*http://catalog.northeastern.edu/graduate/science/marine-environmental-sciences/marine-environmental-sciences-ms/*) degree. Note that no students will be admitted directly into the Marine and Environmental Sciences program to pursue a master's degree.*

PhD Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Dissertation committee
Qualifying examination
Dissertation proposal
Candidacy
First-author publication
Dissertation defense

Core Requirements

Code	Title	Hours
Statistics		
Complete one of the following:		4
ENVR 6500 and ENVR 6501	Biostatistics and Lab for ENVR 6500	
EEMB 5522 and EEMB 5523	Experimental Design Marine Ecology and Lab for EEMB 5522	
Alternative statistics course as approved by graduate committee		
Research		
Complete the following (repeatable) course twice:		8
EEMB 8984	Research	

Concentration

Complete one of the following concentrations:

- Ecology and Evolutionary Biology (p. 1)
- Sustainability Sciences (p. 2)
- Geosciences (p. 2)
- Marine Sciences (p. 2)

ECOLOGY AND EVOLUTIONARY BIOLOGY

Code	Title	Hours
Seminars		
EEMB 7102	Seminar in Ecology and Evolutionary Biology	2
Complete one of the following:		2
EEMB 7101	Seminar in Marine and Environmental Sciences	
EEMB 7103	Seminar in Sustainability Sciences	
EEMB 7104	Seminar in Geosciences	
Readings		
EEMB 8102	Readings in Ecology and Evolutionary Biology	2
Concentration-Specific Electives		
Complete 12 semester hours from the following:		12
ENVR 5210	Environmental Planning	
ENVR 5242 and ENVR 5243	Ancient Marine Life and Lab for ENVR 5242	
ENVR 5260	Geographical Information Systems	
EEMB 5130 and EEMB 5131	Ecological Dynamics and Lab for EEMB 5130	
EEMB 5504	Biology of Corals	
EEMB 5506	Biology and Ecology of Fishes	
EEMB 5508 and EEMB 5509	Marine Birds and Mammals and Lab for EEMB 5508	
EEMB 5512	Tropical Terrestrial Ecology	
EEMB 5516 and EEMB 5517	Oceanography and Lab for EEMB 5516	
EEMB 5518	Ocean and Coastal Processes	
EEMB 5520	Coral Reef Ecology	
EEMB 5528	Marine Conservation Biology	
EEMB 5532	Physiological and Molecular Marine Ecology	
EEMB 5534 and EEMB 5535	Marine Invertebrate Zoology and Botany and Lab for EEMB 5534	
EEMB 5536	Ocean and Coastal Sustainability	
Substitutions may be made with approval of graduate committee.		

SUSTAINABILITY SCIENCES

Code	Title	Hours
Seminars		
EEMB 7103	Seminar in Sustainability Sciences	2
Complete one of the following:		2
EEMB 7101	Seminar in Marine and Environmental Sciences	
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7104	Seminar in Geosciences	
Readings		
EEMB 8103	Readings in Sustainability Sciences	2
Concentration-Specific Electives		
Complete 12 semester hours from the following:		12
ENVR 5115	Advanced Topics in Environmental Geology	
ENVR 5260	Geographical Information Systems	
EEMB 5130 and EEMB 5131	Ecological Dynamics and Lab for EEMB 5130	
EEMB 5506	Biology and Ecology of Fishes	
EEMB 5516 and EEMB 5517	Oceanography and Lab for EEMB 5516	
EEMB 5518	Ocean and Coastal Processes	
EEMB 5528	Marine Conservation Biology	
EEMB 5536	Ocean and Coastal Sustainability	
INSH 5301	Introduction to Computational Statistics	
INSH 5302	Information Design and Visual Analytics	
INSH 6406	Analyzing Complex Digitized Data	
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
PPUA 7346	Resilient Cities	
POLS 7202	Quantitative Techniques	
POLS 7334	Social Networks	
Substitutions may be made with approval of graduate committee.		

GEOSCIENCES

Code	Title	Hours
Seminars		
EEMB 7104	Seminar in Geosciences	2
Complete one of the following:		2
EEMB 7101	Seminar in Marine and Environmental Sciences	
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7103	Seminar in Sustainability Sciences	
Readings		
EEMB 8104	Readings in Geosciences	2
Concentration-Specific Electives		
Complete 12 semester hours from the following:		12
ENVR 5115	Advanced Topics in Environmental Geology	
ENVR 5190	Soil Science	
ENVR 5210	Environmental Planning	
ENVR 5240 and ENVR 5241	Sedimentary Basin Analysis and Lab for ENVR 5240	
ENVR 5242 and ENVR 5243	Ancient Marine Life and Lab for ENVR 5242	
ENVR 5260	Geographical Information Systems	
ENVR 5270 and ENVR 5271	Glacial and Quaternary History and Lab for ENVR 5270	
EEMB 5518	Ocean and Coastal Processes	
EEMB 5536	Ocean and Coastal Sustainability	
Substitutions may be made with approval of graduate committee.		

MARINE SCIENCES

Code	Title	Hours
Seminars		
EEMB 7101	Seminar in Marine and Environmental Sciences	2
Complete one of the following:		2
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7103	Seminar in Sustainability Sciences	
EEMB 7104	Seminar in Geosciences	
Readings		
EEMB 8101	Readings in Marine Sciences	2
Concentration-Specific Electives		
Complete 12 semester hours from the following:		12
ENVR 5242 and ENVR 5243	Ancient Marine Life and Lab for ENVR 5242	
ENVR 5260	Geographical Information Systems	
ENVR 5270 and ENVR 5271	Glacial and Quaternary History and Lab for ENVR 5270	
EEMB 5130 and EEMB 5131	Ecological Dynamics and Lab for EEMB 5130	
EEMB 5504	Biology of Corals	
EEMB 5506	Biology and Ecology of Fishes	
EEMB 5508 and EEMB 5509	Marine Birds and Mammals and Lab for EEMB 5508	
EEMB 5516 and EEMB 5517	Oceanography and Lab for EEMB 5516	
EEMB 5518	Ocean and Coastal Processes	
EEMB 5520	Coral Reef Ecology	
EEMB 5528	Marine Conservation Biology	
EEMB 5534 and EEMB 5535	Marine Invertebrate Zoology and Botany and Lab for EEMB 5534	
EEMB 5536	Ocean and Coastal Sustainability	
Substitutions may be made with approval of graduate committee.		

Dissertation

Code	Title	Hours
EEMB 9990	Dissertation Term 1	
EEMB 9991	Dissertation Term 2	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Advanced Entry PhD Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Dissertation committee
Qualifying examination
Dissertation proposal
Candidacy
First-author publication
Dissertation defense

Core Requirements

Code	Title	Hours
Statistics		
Complete one of the following:		4
ENVR 6500 and ENVR 6501	Biostatistics and Lab for ENVR 6500	
EEMB 5522 and EEMB 5523	Experimental Design Marine Ecology and Lab for EEMB 5522	
Alternative statistics course as approved by graduate committee		

Concentration

Complete one of the following concentrations:

- Ecology and Evolutionary Biology (p. 1)
- Sustainability Sciences (p. 2)
- Geosciences (p. 2)
- Marine Sciences (p. 2)

ECOLOGY AND EVOLUTIONARY BIOLOGY

Code	Title	Hours
Seminars		
EEMB 7102	Seminar in Ecology and Evolutionary Biology	2
Complete one of the following:		2
EEMB 7101	Seminar in Marine and Environmental Sciences	
EEMB 7103	Seminar in Sustainability Sciences	
EEMB 7104	Seminar in Geosciences	
Readings		
EEMB 8102	Readings in Ecology and Evolutionary Biology	2

SUSTAINABILITY SCIENCES

Code	Title	Hours
Seminars		
EEMB 7103	Seminar in Sustainability Sciences	2
Complete one of the following:		2
EEMB 7101	Seminar in Marine and Environmental Sciences	
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7104	Seminar in Geosciences	
Readings		
EEMB 8103	Readings in Sustainability Sciences	2

GEOSCIENCES

Code	Title	Hours
Seminars		
EEMB 7104	Seminar in Geosciences	2
Complete one of the following:		2
EEMB 7101	Seminar in Marine and Environmental Sciences	
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7103	Seminar in Sustainability Sciences	
Readings		
EEMB 8104	Readings in Geosciences	2

MARINE SCIENCES

Code	Title	Hours
Seminars		
EEMB 7101	Seminar in Marine and Environmental Sciences	2
Complete one of the following:		2
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7103	Seminar in Sustainability Sciences	
EEMB 7104	Seminar in Geosciences	
Readings		
EEMB 8101	Readings in Marine Sciences	2

Dissertation

Code	Title	Hours
EEMB 9990	Dissertation Term 1	
EEMB 9991	Dissertation Term 2	

Program Credit/GPA Requirements

10 total semester hours required
Minimum 3.000 GPA required