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. For students entering with a bachelor's degree, MES program completion requires 30 semester hours of graduate-level course work, of which 20 semester hours must carry a letter grade. All entering students must take a statistics course. This requirement may be waived for students who have taken a graduate level statistics course pending approval by the department's graduate committee. The remaining 10 semester hours must consist of two semesters of concentration seminars (one in the student's concentration and another of their choice), doctoral research, and approved graduate courses. Planned course work must be approved by the student's dissertation committee.

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

1. An oral examination by the student's dissertation committee consisting of an oral presentation.
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 one first-authored publication 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.

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
Readings		
Complete the following (repeatable) course twice:		2
EEMB 8982	Readings	
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 Seminar in M	(TBA)	
EEMB 7103	Seminar in Sustainability Sciences	
EEMB 7104	Seminar in Geosciences	
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 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	
ENVR 5400	Marine Science Policy and Ethics	
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 Seminar in M	(TBA)	
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7104	Seminar in Geosciences	
Statistics		
ENVR 6500 and ENVR 6501	Biostatistics and Lab for ENVR 6500	4
Alternative statistics course as approved by graduate committee		
Concentration Specific Electives		
Complete 12 semester hours from the following:		12
ENVR 5115	Advanced Topics in Environmental Geology	
ENVR 5250	Geology and Land-Use Planning	
ENVR 5260	Geographical Information Systems	
ENVR 5400	Marine Science Policy and Ethics	
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 6406	Analyzing Complex Digitized Data	
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	
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 Seminar in M	(TBA)	
EEMB 7102	Seminar in Ecology and Evolutionary Biology	
EEMB 7103	Seminar in Sustainability Sciences	
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 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 5230 and ENVR 5231	Structural Geology and Lab for ENVR 5230	
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 5250	Geology and Land-Use Planning	
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 Seminar in Mar	(TBA)	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	
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 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	
ENVR 5400	Marine Science Policy and Ethics	
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
Complete the following (repeatable) course twice:		
EEMB 9990	Dissertation	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required