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**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td><strong>Statistics</strong></td>
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<td></td>
<td>Complete one of the following:</td>
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<tr>
<td>ENVR 6500</td>
<td>Biostatistics and Lab for ENVR 6500</td>
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<tr>
<td>EEMB 5522</td>
<td>Experimental Design Marine Ecology</td>
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<td>Alternative statistics course as approved</td>
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<td></td>
<td><strong>Research</strong></td>
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<td>Complete the following (repeatable) course 8</td>
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<tr>
<td>EMBB 8984</td>
<td>Research</td>
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**Concentration**

Complete one of the following concentrations:

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

**ECOLOGY AND EVOLUTIONARY BIOLOGY**

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td></td>
<td><strong>Seminars</strong></td>
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<tr>
<td>EEMB 7102</td>
<td>Seminar in Ecology and Evolutionary Biology</td>
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<tr>
<td></td>
<td><strong>Readings</strong></td>
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<tr>
<td>EEMB 8102</td>
<td>Readings in Ecology and Evolutionary Biology</td>
<td>2</td>
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</table>

**Concentration-Specific Electives**

Complete 12 semester hours from the following:

- 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 and EEMB 5517 Biology and Ecology of Fishes and Lab for EEMB 5517
- EEMB 5518 Oceanography and Coastal Processes
- EEMB 5520 Tropical Marine Ecology
- EEMB 5532 Physiological and Molecular Marine Ecology

Substitutions may be made with approval of graduate committee.

**SUSTAINABILITY SCIENCES**

<table>
<thead>
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<tr>
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<tr>
<td>EEMB 7104</td>
<td>Seminar in Geosciences</td>
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### MARINE SCIENCES

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<tbody>
<tr>
<td>EEMB 7101</td>
<td>Seminar in Marine Sciences</td>
<td>2</td>
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#### Seminars

- Complete one of the following: 2
  
  - EEMB 7101: Seminar in Marine 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 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
- 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 7334: Social Networks

Substitutions may be made with approval of graduate committee.

### Dissertations

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>EEMB 9991</td>
<td>Dissertation Term 2</td>
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### 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

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<td>Seminar in Geosciences</td>
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</table>

#### Readings

- EEMB 8101: Readings in Marine Sciences 2

#### Concentration-Specific Electives

Complete 12 semester hours from the following: 12

- ENVR 5242: Ancient Marine Life
- ENVR 5243 and Lab for ENVR 5242
- ENVR 5260: Geographical Information Systems
- ENVR 5270: Glacial and Quaternary History and Lab for ENVR 5270
- EEMB 5130: Ecological Dynamics and Lab for EEMB 5130
- EEMB 5504: Biology of Corals
- EEMB 5506: Biology and Ecology of Fishes
- EEMB 5508: Marine Birds and Mammals
- EEMB 5516: Oceanography and Lab for EEMB 5516
- EEMB 5518: Ocean and Coastal Processes
- EEMB 5520: Tropical Marine Ecology

Substitutions may be made with approval of graduate committee.

#### Statistics

Complete one of the following: 4-5

- ENVR 6500: Biostatistics and Lab for ENVR 6500
- EEMB 5522: Experimental Design Marine Ecology

Alternative statistics course as approved by graduate committee.
Concentration
Complete one of the following concentrations:

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

ECOLOGY AND EVOLUTIONARY BIOLOGY

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Complete one of the following:

- EEMB 7101 Seminar in Marine Sciences
- EEMB 7103 Seminar in Sustainability Sciences
- EEMB 7104 Seminar in Geosciences

Readings

- EEMB 8102 Readings in Ecology and Evolutionary Biology 2

SUSTAINABILITY SCIENCES

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Complete one of the following:

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- EEMB 7104 Seminar in Geosciences

Readings

- EEMB 8103 Readings in Sustainability Sciences 2

GEOSCIENCES

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Complete one of the following:

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Readings

- EEMB 8104 Readings in Geosciences 2

MARINE SCIENCES

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</tbody>
</table>

Complete one of the following:

- 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

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<td></td>
</tr>
</tbody>
</table>

Program Credit/GPA Requirements
10 total semester hours required
Minimum 3.000 GPA required