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.

**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>Statistics</td>
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<tr>
<td>EEMB 5522</td>
<td>Experimental Design Marine Ecology</td>
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<tr>
<td>ENVR 6500 and ENVR 6501</td>
<td>Biostatistics and Lab for ENVR 6500</td>
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<tr>
<td>Alternative statistics course as approved by graduate committee</td>
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<td>Research</td>
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Complete the following (repeatable) course twice:

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<tr>
<th>Code</th>
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<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>EEMB 8984</td>
<td>Research</td>
<td>8</td>
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</table>

**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>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEMB 7102</td>
<td>Seminar in Ecology and Evolutionary Biology</td>
<td>2</td>
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</table>

Complete one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>EEMB 7101</td>
<td>Seminar in Marine Sciences</td>
<td>2</td>
</tr>
<tr>
<td>EEMB 7103</td>
<td>Seminar in Sustainability Sciences</td>
<td></td>
</tr>
<tr>
<td>EEMB 7104</td>
<td>Seminar in Geosciences</td>
<td></td>
</tr>
</tbody>
</table>

**Readings**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>EEMB 8102</td>
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<td>2</td>
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**Concentration-Specific Electives**

Complete 12 semester hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEMB 5130 and EEMB 5131</td>
<td>Population Dynamics and Lab for EEMB 5130</td>
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<tr>
<td>EEMB 5504</td>
<td>Biology of Corals</td>
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<tr>
<td>EEMB 5506</td>
<td>Biology and Ecology of Fishes</td>
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<tr>
<td>EEMB 5508</td>
<td>Marine Birds and Mammals</td>
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<tr>
<td>EEMB 5516 and EEMB 5517</td>
<td>Oceanography and Lab for EEMB 5516</td>
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</tr>
<tr>
<td>EEMB 5518</td>
<td>Ocean and Coastal Processes</td>
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<tr>
<td>EEMB 5520</td>
<td>Tropical Marine Ecology</td>
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<tr>
<td>ENVR 5210</td>
<td>Environmental Planning</td>
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<tr>
<td>ENVR 5242 and ENVR 5243</td>
<td>Ancient Marine Life and Lab for ENVR 5242</td>
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</tr>
<tr>
<td>ENVR 5260</td>
<td>Geographical Information Systems</td>
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</table>

Substitutions may be made with approval of graduate committee.

**SUSTAINABILITY SCIENCES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEMB 7103</td>
<td>Seminar in Sustainability Sciences</td>
<td>2</td>
</tr>
</tbody>
</table>

Complete one of the following:

<table>
<thead>
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<td>Seminar in Marine Sciences</td>
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<tr>
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<td>Seminar in Ecology and Evolutionary Biology</td>
<td></td>
</tr>
<tr>
<td>EEMB 7104</td>
<td>Seminar in Geosciences</td>
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**Readings**

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<tr>
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<tbody>
<tr>
<td>EEMB 8103</td>
<td>Readings in Sustainability Sciences</td>
<td>2</td>
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</tbody>
</table>

**Concentration-Specific Electives**

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.
Complete 12 semester hours from the following:  
EEMB 5130 and EEMB 5131  
EEMB 5506  
EEMB 5516 and EEMB 5517  
EEMB 5518  
ENVR 5115  
ENVR 5260  
INSH 5301  
INSH 5406  
POLS 7334  
PPUA 5261  
PPUA 7346
Substitutions may be made with approval of graduate committee.

GEOSCIENCES

Seminars
EEMB 7104  Seminar in Geosciences
Complete one of the following:  
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

Concentration-Specific Electives
Complete 12 semester hours from the following:  
EEMB 5518  
ENVR 5115  
ENVR 5190  
ENVR 5210  
ENVR 5240 and ENVR 5241  
ENVR 5242 and ENVR 5243  
ENVR 5260  
ENVR 5270 and ENVR 5271
Substitutions may be made with approval of graduate committee.

Marine Sciences

Seminars
EEMB 7101  Seminar in Marine Sciences  
EEMB 7102  Seminar in Ecology and Evolutionary Biology

Readings
EEMB 7104  Seminar in Geosciences

Concentration-Specific Electives
Complete 12 semester hours from the following:  
EEMB 5130 and EEMB 5131  
EEMB 5506  
EEMB 5516 and EEMB 5517  
EEMB 5518  
ENVR 5115  
ENVR 5260  
ENVR 5270 and ENVR 5271
Substitutions may be made with approval of graduate committee.

Dissertation

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

Advanced Entry 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

Statistics
Complete one of the following:  
ENVR 6500 and ENVR 6501  
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. 1)
• Geosciences (p. 2)
• Marine Sciences (p. 2)

### ECOLOGY AND EVOLUTIONARY BIOLOGY

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<tr>
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<tbody>
<tr>
<td>EEMB 7102</td>
<td>Seminar in Ecology and Evolutionary Biology</td>
<td>2</td>
</tr>
</tbody>
</table>

Complete one of the following: 2

- 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

<table>
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<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>EEMB 7103</td>
<td>Seminar in Sustainability Sciences</td>
<td>2</td>
</tr>
</tbody>
</table>

Complete one of the following: 2

- EEMB 7101 Seminar in Marine Sciences
- EEMB 7102 Seminar in Ecology and Evolutionary Biology
- EEMB 7104 Seminar in Geosciences

**Readings**

- EEMB 8103 Readings in Sustainability Sciences 2

### GEOSCIENCES

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<tbody>
<tr>
<td>EEMB 7104</td>
<td>Seminar in Geosciences</td>
<td>2</td>
</tr>
</tbody>
</table>

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

### MARINE SCIENCES

<table>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>EEMB 7101</td>
<td>Seminar in Marine Sciences</td>
<td>2</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>EEMB 9990</td>
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<tr>
<td>EEMB 9991</td>
<td>Dissertation Term 2</td>
<td></td>
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</tbody>
</table>

### Program Credit/GPA Requirements

10 total semester hours required
Minimum 3.000 GPA required