

## BIOLOGICAL OCEANOGRAPHY

MIT-WHOI Joint Program in Oceanography/Applied Ocean Science and Engineering (<https://catalog.mit.edu/interdisciplinary/graduate-programs/joint-program-woods-hole-oceanographic-institution>)

### Doctor of Philosophy in Biological Oceanography

#### Core Subject

7.470 Biological Oceanography 12

#### Foundational Statistics 12

Select one of the following:

1.010 Probability and Causal Inference

18.05 Introduction to Probability and Statistics

IDS.013[[]] Statistical Thinking and Data Analysis

IDS.014[[]] Fundamentals of Statistics

#### Quantitative Methods of Data Analysis and/or Modeling 12

Select one of the following:<sup>1</sup>

7.440 An Introduction to Mathematical Ecology

9.014 Quantitative Methods and Computational Models in Neurosciences

12.586 Modeling Environmental Complexity

12.747 Modeling, Data Analysis, and Numerical Techniques for Geochemistry

12.823 Modeling the Biology and Physics of the Ocean

#### Graduate-Level Oceanography or Marine Science<sup>2, 3</sup> 24

12.702 Elements of Modern Oceanography

12.710 Geological Oceanography

12.739 Marine Microbiology and Biogeochemistry

12.741 Marine Bioinorganic Chemistry

12.742 Marine Chemistry

12.743 Geochemistry of Marine Sediments

12.744 Marine Isotope Chemistry

12.800 Fluid Dynamics of the Atmosphere and Ocean

12.808 Introduction to Observational Physical Oceanography

12.862 Coastal Physical Oceanography

7.430 Topics in Quantitative Marine Science

7.431 Topics in Marine Ecology

7.432 Topics in Marine Physiology and Biochemistry

7.433 Topics in Biological Oceanography

7.434 Topics in Zooplankton Biology

7.435 Topics in Benthic Biology

7.436 Topics in Phytoplankton Biology

7.437 Topics in Molecular Biological Oceanography

7.438 Topics in the Behavior of Marine Animals

7.439 Topics in Marine Microbiology

#### Specialization 36

Individually designed program leading to a specialized area of study. Options include but is not limited to benthic ecology, microbial ecology and biogeochemistry, biogeography and systematics, environmental toxicology and developmental biology, plankton ecology, marine mammals, and mathematical ecology and conservation

#### Thesis and Research

Pre-Thesis Research<sup>4</sup> 96

Thesis (.THG subject of home department)<sup>4</sup> 288-396

**Total Units 480-588**

<sup>1</sup> Harvard courses OEB137 *Experimental Design and Statistics for Ecology and MCB 112 Biological Data Analysis* may also be used to satisfy this requirement.

<sup>2</sup> Other relevant courses can be requested by petition to the Joint Committee on Biological Oceanography.

<sup>3</sup> Up to 12 of the 24 units may come from Topics subjects.

<sup>4</sup> Biological oceanography students whose home department is Civil and Environmental Engineering register for 1.THG whether they are completing pre-thesis or thesis research, for a total of 384–492 units of 1.THG over the course of the five-year doctoral program