

Double Major: BS Marine Biology and BS Ocean Engineering

This program provides the opportunity to combine these two exciting fields in a challenging **5-year program** that will most likely include some summer study. If you are interested, please work closely with the Coordinator of the Marine Biology Program and your advisor in Ocean Engineering to arrange your schedule to meet the most current curriculum requirements for both majors. Sample below.

Freshman Year Fall Semester

4 BIO 101 Principles of Biology I
1 BIO 130 Topics Marine Biology
3 CHM 101 General Chemistry Lecture I
1 CHM 102 Laboratory for Chemistry 101
3 General Education Elective⁵
3 General Education Elective⁵

Freshman Year Spring

3 BIO 102 Principles of Biology II
3 CHM 112 General Chemistry Lecture II
1 CHM 114 Laboratory for Chemistry 112
4 MTH 141 Calculus w/Analytical Geometry I
3 ECN 201 Prin of Econ: Microeconomics
3 General Education Elective⁵

Sophomore Year Fall Semester

4 BIO 360 Marine Biology
3 Chemistry Elective⁴
1 Chemistry Elective⁴
2 EGR 105 Found of Engineering
4 MTH 142 Calculus w/Analytical Geometry II
3 PHY 203 Elementary Physics I
1 PHY 273 Elementary Physics Lab I

Sophomore Year Spring Semester

2 EGR106 Found Of Engineer. II
3-4 Biology Core¹
3 Marine Biology Elective³
3 MTH243 Calculus Func of Several Var
1 OCE 101 Intro to Ocean Engineering
3 PHY 204 Elementary Physics II
1 PHY 274 Elementary Physics Lab II

Junior Year Fall Semester

3 Chemistry Elective⁴
4 OCE 205 Ocean Engineering Design Tools
3 MCE 262 Statics
1 OCE 215 Ocean Engineering Design
3 PHY 205 Elementary Physics III
1 PHY 275 Elementary Physics Lab III
3 General Education Elective⁵

Junior Year Spring Semester

3 OCE 206 Ocean Instrumentation
3-4 Marine Biology Elective³
3 CVE 220 Mechanics of Materials
3 MCE 263 Dynamics
3 MTH 244 Differential Equations
1 OCE 216 Intro to Ocean Eng Design

Senior Year Summer Term)

3 General education elective
3-4 Biology Core¹

Senior Year Fall Semester

3 MCE354 Fluid Mechanics
3-4 Biology Core¹
3-4 Marine Biology Elective³
3 OCE 301 Fundamentals of Ocean Mech
3 OCE 310 Basic Ocean Measurements

Senior Year Spring Semester

3-4 Marine Biology Elective³
4 OCE 408 Wave and Littoral Processes
4 OCE 311 Coast Measure & Appli
3 OCE 471 Underwater Acoustics
3 OCG 451 Oceanographic Science

Fifth Year Summer

3-4 Biology Core¹
3-4 Marine Biology Elective³

Fifth Year Fall Semester

3 OCE 495 Senior Design Project I
2 OCE 416 Ocean Eng Pro Practice
3 OCE 421 Marine Structure Design
3 Professional Elective⁴
3 Professional Elective⁴
3 General Education Elective⁵

Fifth Year Spring Semester

3 OCE 496 Senior Design Project II
3 General Education Elective⁵
3 General Education Elective⁵
3 Professional Elective²
3 Professional Elective²

1. **Biology Core courses**, choose one from four of the following six areas (at least 12 credits):
 - Cell and Development: BIO 302 311, 341 or 453
 - Molecular Biology: BIO 437
 - Genetics: BIO 352
 - Organismal Diversity: BIO 304, 321, 323, 354, 432, 365, or 366;
 - Physiology: BIO 201 or 346
 - Ecology and Evolution: BIO 262 or 272;

2. **Marine Biology Electives** (the balance of the 36 credits in Biology) Marine Environmental Physiology (BIO 345)
Marine Invertebrates of Southern New England (BIO 355) Evolution and Diversity of Fishes (BIO 412)
Ecology of Marine Plants (BIO 418) Deep Sea Biology (OCG 420)
Environmental Physiology of Animals (BIO 441) Marine Ecology (BIO 455)
Marine Ecology Laboratory (BIO 457) Biology of Algae (BIO 365)
Tropical Marine Invertebrates (BIO 469)* Coral Reef Ecology (BIO 475)*
Directed Research/Special Problems (AFS, AVS, BCH, BIO, MIC, NRS, PLS 491, 492; BIO 495*; OCG 493, 494)
Seminar on Marine Mammals (AVS 440) Biology and Ecology of Fishes (BIO 563)
Marine Microbiology (OCG 576)
*Taught at the Bermuda Institute of Ocean Sciences

3. **Chemistry courses** must be met by taking:
 - Organic Chemistry I and II with lab (CHM 226, 227, 228) OR
 - Intro to Organic Chem. and Biochemistry (CHM 124, 126; BCH 311)

4. **Professional Electives for Engineering** must be satisfied by a minimum of:
Two, approved 3-credit elective courses at the 300, 400, or 500 level in Engineering, Mathematics or Oceanography and two, approved, 3 credit courses in Ocean Engineering.

5. **General Education for Engineering**. Breadth: At least one course in each of the General Education Areas. Depth: At least one additional course in 3 different General Education Areas with remainder taken in any Gen Ed area/areas. Additional MQ General Education Elective courses are restricted to MTH 111 (only if taken prior to passing MTH 141),