Five Year BS in Marine Biology and BS in Ocean Engineering  (4/21/10 – JM, JW)

**Freshman Year Fall Semester (15 credits)**
- 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 Elective
- 3 General Education Elective

**Freshman Year Spring Semester (17 credits)**
- 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 Elective

**Sophomore Year Fall Semester (17 credits)**
- 4 BIO 360 Marine Biology
- 3 Chemistry Elective
- 1 Chemistry Elective
- 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 (16 credits)**
- 2 EGR106 Found Of Engineer. II
- 3-4 Biology Core
- 3 Marine Biology Elective
- 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 (18 credits)**
- 3 Chemistry Elective
- 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 Elective

**Junior Year Spring Semester (17-18 credits)**
- 3 OCE 206 Ocean Instrumentation
- 3-4 Marine Biology Elective
- 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 (6-7 credits)**
- 3 General education elective
- 3-4 Biology Core

**Senior Year Fall Semester (15-17 credits)**
- 3 MCE354 Fluid Mechanics
- 3-4 Biology Core
- 3-4 Marine Biology Elective
- 3 OCE 301 Fundamentals of Ocean Mech
- 3 OCE 310 Basic Ocean Measurements

**Senior Year Spring Semester (17-18 credits)**
- 3-4 Marine Biology Elective
- 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 (6-8 credits)**
- 3-4 Biology Core
- 3-4 Marine Biology Elective

**Fifth Year Fall Semester (17 credits)**
- 3 OCE 495 Senior Design Project I
- 2 OCE 416 Ocean Eng Pro Practice
- 3 OCE 421 Marine Structure Design
- 3 Professional Elective
- 3 Professional Elective
- 3 General Education Elective

**Fifth Year Spring Semester (15 credits)**
- 3 OCE 496 Senior Design Project II
- 3 General Education Elective
- 3 General Education Elective
- 3 Professional Elective
- 3 Professional Elective
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),