

B. S. MARINE BIOLOGY

College of the Environment and Life Sciences

Department: Biological Sciences

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http://www.uri.edu/cels/bio/marbio/mbio_main.html

Credits: 120

The Major. *The B.S. Marine Biology* program encompasses a rigorous curriculum stressing a strong foundation in biological sciences as well as chemistry, math, physics and oceanography as preparation for further study in graduate school, and for a broad range of careers. All majors start their freshman year with a seminar on Topics in Marine Biology (=URI 101). After a year of Introductory Biology (which may be satisfied by AP credit), students choose four core biology courses, and then Marine Biology elective courses can be taken as soon as prerequisites are met. Students may choose from undergraduate courses and some graduate courses offered by URI's many marine-related programs such as Fisheries, Aquaculture, Marine Affairs and Oceanography.

The Faculty in the marine biology program are actively involved in research on a wide variety of fields, including functional morphology of fishes, behavior of invertebrates, ecology of marine algae and seaweeds, physiological adaptations of invertebrates to extreme marine environments, genomics of marine algae, salt marsh ecology and biogeochemistry, and developmental and sensory biology of fishes.

Experiential Learning. Students are encouraged to participate in research directed by faculty in Biological Sciences, in other departments in the College of the Environment and Life Sciences, and in the Graduate School of Oceanography (e.g., via the Coastal Fellows Program, the EPSCoR Fellows Program, or the Graduate School of Oceanography's REU-SURFO Program), or to become involved in off-campus research opportunities. Internships in research, outreach and education may take place at various sites, such as the RI Department of Environmental Management, the Mystic Aquarium and Institute for Exploration, the Roger Williams Zoo, Save the Bay, and the Naval Undersea Warfare Center. URI offers credit for work at the Bermuda Institute of Ocean Science (www.bios.edu, Fall semester program) and the SEA Semester program at Woods Hole (www.sea.edu) through the URI Study Abroad Program, where students can spend a semester taking courses and doing research in the field and/or aboard ship.

Advising and Mentoring. After transferring from UC into CELS (having earned 30 credits and a GPA >2.00), each student is assigned to a faculty advisor from the Marine Biology faculty. The Marine Biology Program Coordinator maintains a marine biology listserv and sends out a weekly e-newsletter to all majors and other interested students with information about courses, jobs, internships, and special lectures or seminars and other activities of interest. In addition, Marine Biology Peer Mentors are enthusiastic and knowledgeable about curriculum and other matters and hold walk-in office hours.

Program Requirements. *Marine Biology requirements.* Majors must complete 36 credits in biological sciences including 2 semesters of Principles of Biology (BIO 101/103, 102/104), Topics in Marine Biology (BIO 130), and Marine Biology (BIO 360). Of the remaining 23 credits, one course must be chosen from 4 of the 6 core areas (Cell and Development, BIO 302, 311, 341; Ecology and Evolution, BIO 262, 272; Genetics, BIO 352; Molecular Biology, BIO 437; Organismal Diversity, BIO 321, 323, 354, 365, 366, 404 (304), 412, MIC 211; and Physiology BIO 201, 346). Students choose the balance of 36 credits in the major from among the marine biology elective courses (BIO 345, 355, 365, 412, 418, 441, 455, 457, 469, 475, 485X, 563, AVS 440, and OCG 420, 576). At least 2 BIO laboratory courses must be completed (excluding BIO 103, 104, and independent study/research). A maximum of 3 credits of special problems, independent study or research (491, 492, 493, 494, or 495 from one of the following programs: AFS, AVS, BCH, BIO, MIC, NRS, PLS, OCG) may be used to fulfill major credit requirements. *A minimum GPA of 2.0 in BIO courses* used to satisfy the major is required.

Additional requirements. Students must also complete 2 semesters of calculus (MTH 131, 132 or MTH 141, 142) or 1 semester each of calculus and statistics (MTH 131 or 141 and STA 308), 2 semesters of general chemistry with lab (CHM 101, 102, 112, 114), 2 semesters of organic chemistry with lab (CHM 227, 228, 226) or 1 semester each of organic chemistry with lab and biochemistry (CHM 124, 126, BCH 311), 2 semesters of physics with lab (PHY 111, 112, 185, 186), and 1 semester of oceanography (OCG 401 or 451). General Education courses in English Communication, Fine Arts and Literature, Foreign Language and Culture, Letters, and Social Science follow the requirements of the College of the Environment and Life Sciences.

BACHELOR OF SCIENCE MARINE BIOLOGY

B.S. in Marine Biology – Program Requirements	
Core Requirements (13 credits)	<i>Required (13 credits):</i> Principles of Biology I and II (BIO 101/103, 102/104); Topics in Marine Biology BIO 130; Marine Biology BIO 360
Additional Core Courses and Marine Biology Electives (23 credits) (including 2 laboratory courses required)	<i>Choose one course from 4 of the following 6 core areas (a minimum of 12 credits):</i> Cell and Development: BIO 302, 311, 341 Ecology and Evolution: BIO 262, 272 Genetics: BIO 352 Molecular Biology: BIO 437 Organismal Diversity: BIO 321, 323, 354, 365, 366, 404 (304), 412; MIC 211 Physiology: BIO 201, 346
	<i>Choose the balance of 36 credits from:</i> 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) (465) Salt Marsh Ecology (BIO 485) Tropical Marine Invertebrates (BIO 469)* Coral Reef Ecology (BIO 475)* Directed Research/Special Problems (AFS, AVS, BCH, BIO, MIC, NRS, and PLS 491, 492; BIO 495*; OCG 493, 494) Tropical Marine Biology Research (BIO 495)* 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
Mathematics	Calculus I and II (MTH 131, 132 OR MTH 141, 142) <u>OR</u> One semester of Calculus & one semester of Statistics (MTH 131 or 141 & STA 308)
Chemistry	General Chemistry I and II with lab (CHM 101, 102; 112, 114) <u>AND</u> Organic Chemistry I and II with lab (CHM 227, 228, 226) <u>OR</u> Introduction to Organic Chemistry with lab and Biochemistry (CHM 124, 126; BCH 311)
Physics	General Physics I and II with laboratories (PHY 111, 112; 185, 186)
Oceanography	General Oceanography (OCG 401) <u>OR</u> Oceanographic Science (OCG 451)
General Education Requirements	English Communication, 6 cr, including WRT 104, 105 or 106; Social Sciences, 6 cr; 15 credits in Fine Arts and Literature (3-6 cr); Letters (3-6 cr), and Foreign Language and Culture (3-6 cr); Math and Natural Sciences general education requirements are met by the B.S. Marine Biology program requirements.
Remarks	Students must take 2 laboratory courses in Biology in addition to BIO 101/103, 102/104, and 360, excluding independent study/research. No more than 3 credits of Research/ Special Problems (491, 492, 493, 494, or 495) may be used towards the major. A total of 36 credits in BIO courses is required. 120 credits are required for graduation. Students must maintain a 2.00 grade point average in BIO courses used to meet graduation requirements.

B.S. Marine Biology Academic Worksheet

BIOLOGY REQUIREMENTS

[] CREDITS

Required BIO Courses (13 credits)

BIO 101/103 _____ (4 credits)
 BIO 102/104 _____ (4 credits)
 BIO 130 _____ (1 credit)
 BIO 360 _____ (4 credits)

CORE BIO COURSES AND MARINE BIOLOGY ELECTIVES (23 CREDITS, MINIMUM)

[] credits

Core BIO Courses (4 courses required)

<i>Core Area</i>	<i>Core courses</i>	
_____	_____ (____ credits)	In addition to 103, 104 & 360
_____	_____ (____ credits)	
_____	_____ (____ credits)	Two Lab courses _____
_____	_____ (____ credits)	_____

Marine Biology Electives* (balance of 23 credits)

_____ (____ credits)
 _____ (____ credits)
 _____ (____ credits)
 _____ (____ credits)
 _____ (____ credits)

*UP TO 3 CREDITS OF INDEPENDENT STUDY/RESEARCH (491, 492, 493, 494, OR 495) IN ONE OF THE FOLLOWING PROGRAMS MAY BE USED FOR MARINE BIOLOGY ELECTIVES: AFS, AVS, BCH, BIO, MIC, NRS, PLS OR OCG. ADDITIONAL RESEARCH CREDITS COUNT AS FREE ELECTIVES.

ADDITIONAL SCIENCE REQUIREMENTS

[] CREDITS

OCEANOGRAPHY (3 CREDITS)

OCG 401 OR OCG 451 _____

CHEMISTRY (15 OR 16 CREDITS)

CHM 101, 102 _____, _____
 CHM 112, 114 _____, _____
 CHM 226, 227 AND 228 _____, _____, _____ **OR** CHM 124, 126 AND BCH 311 _____, _____, _____

MATHEMATICS (6, 7 OR 8 CREDITS)

MTH 131 OR MTH 141 _____
 MTH 132 OR MTH 142 OR STA 308 _____

PHYSICS (8 CREDITS)

PHY 111, 185 _____, _____
 PHY 112, 186 _____, _____

GENERAL EDUCATION REQUIREMENTS

[] CREDITS

WRT 104, 105 or 106 _____	(____ credits)	Diversity courses (2) fulfilled
English Communication (1) _____	(____ credits)	by courses listed in the left
*Fine Arts/Literature (1 or 2) _____	(____ credits)	column of this section.
*Letters (1 or 2) _____	(____ credits)	_____
*Language/Culture (1 or 2) _____	(____ credits)	_____
Social Science (2) _____	(____ credits)	
Natural Sciences (2) (CHM 101), (PHY 111)		Courses from "additional science requirements"
Math (1) _____		Course from "additional science requirements"

*A total of 15 credits in these three areas is required.

FREE ELECTIVES

[] CREDITS

TOTAL – 120 REQUIRED FOR GRADUATION

[] CREDITS

FREE ELECTIVES (PLEASE LIST COURSES AND CREDITS BELOW)

_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)
_____	(____ credits)

FREE ELECTIVE CREDITS (TRANSFER TO OTHER SIDE)

B.S. MARINE BIOLOGY	
FIRST YEAR FALL	FIRST YEAR SPRING
BIO 101/103 (4) CHM 101/102 or Gen Ed (3-4) MTH 111 or MTH 131 (3) Gen Ed (3-4) BIO 130 (1)	BIO 102/104 (4) CHM 112/114 or 101/102 (4) MTH 131, 132 or STA 308 (3) Gen Ed (3-4)
15-16 credits	14-15 credits
SECOND YEAR FALL	SECOND YEAR SPRING
BIO 360 or BIO core course (3-4) CHM 124/126 or 227 or 112/114 (4) Elective or MTH 132 or STA 308 (3-4) Gen Ed (3-4) Optional: Gen Ed or elective (3-4)*	BIO 360 or BIO core course (3-4) BIO 360 or Marine Biology elective (3-4) CHM 124/126 or 227 or 228/226 or BCH 311 (3-5) Gen Ed (3-4) Optional: Gen Ed or elective (3-4)*
14-17 credits	14-17 credits
THIRD YEAR FALL**	THIRD YEAR SPRING**
BIO core course (3-4) PHY 111/185 (4) CHM 228/226 or BCH 311 or elective (3-5) Gen Ed (3-4) Optional: elective (3-4)*	BIO core course (3-4) Marine Biology elective (3-4) PHY 112/186 (4) Gen Ed or BCH 311 (3 or 4) Optional: elective (3-4)*
14-17 credits	14-17 credits
FOURTH YEAR FALL**	FOURTH YEAR SPRING**
Marine Biology elective (3-4) Marine Biology elective (3-4) Gen Ed (3-4) OCG 401 or elective (3-4) Optional: elective (3-4)*	Marine Biology elective (3-4) Marine Biology elective or elective (3-4) Gen Ed or elective (3-4) OCG 451 or elective (3-4) Optional: elective (3-4)*
14-17 credits	14-17 credits

*Consider including when fewer than 15 credits total for other courses.

**Study abroad /full-time internship, substitute required courses for electives in other semesters.

B.S. MARINE BIOLOGY - TRANSFER	
SECOND YEAR FALL	SECOND YEAR SPRING
BIO 101/103 (4) CHM 101/102 (4) MTH 111 or MTH 131 (3) Gen Ed or elective (3-4)	BIO 102/104 (4) CHM 112/114 (4) MTH 131, 132 or STA 308 (3) Gen Ed or elective (3-4)
14-15 credits	14-15 credits
THIRD YEAR FALL	THIRD YEAR SPRING
BIO 360 or BIO core course* (3-4) CHM 124/126 or 227 (4) Elective or MTH 132 or STA 308 (3-4) MBIO elective*, Gen Ed or elective (3-4) Optional: MBIO elective*, Gen Ed or elective (3-4)	BIO core course* (3-4) BIO 360 or MBIO elective* (3-4) CHM 228/226 or BCH 311 (3-5) MBIO elective*, Gen Ed or elective (3-4) Optional: MBIO elective*, Gen Ed or elective (3-4)
14-17 credits	14-17 credits
FOURTH YEAR FALL	FOURTH YEAR SPRING
BIO core course* (3-4) PHY 111/185 (4) CHM 228/226 or BCH 311 or elective (3-5) OCG 401 or MBIO elective* (3-4) Optional: MBIO elective*, Gen Ed or elective (3-4)	BIO core course* (3-4) Marine Biology elective (3-4) PHY 112/186 (4) OCG 451 or MBIO elective* (3-4) Optional: MBIO elective*, Gen Ed or elective (3-4)
14-17 credits	14-17 credits

*Consider including when fewer than 15 credits total for other courses.

A total of 23 credits of BIO core + marine electives is required (i.e., 8 X 3-credit courses, 6 X 4-credit courses, or a combination of 3 and 4 credit courses).