

MARINE BIOLOGY (MINOR)

College of Agriculture and Life Sciences

Program Website (<https://cals.cornell.edu/education/degrees-programs/marine-biology-minor>)

Program Description

Bring new perspectives to a complex, intertwined world.

About 70% of the planet's surface consists of estuarine, coastal, and pelagic ocean environments. By choosing the Concentration in Marine Biology, you will learn about the biology, evolution and ecology of organisms that inhabit these environments and the ecological processes linking them.

At CALS, we deeply believe that effecting meaningful change requires a holistic, systems approach. Marine biology draws from a range of disciplines including organismal biology, marine microbiology, ocean biogeochemistry, biological oceanography and marine ecology. These disciplines consider adaptation of marine organisms to their environment, their interactions with other organisms, and ultimately the consequences and feedbacks of these interactions upon the environment. Marine habitats are sensitive barometers to anthropogenic perturbations today and global climatic perturbations over evolutionary history.

Academic Standards

Minor Declaration Information

Students in the minor are required to take a total of 15 credits (see *curriculum section below*). Students will take an introductory class related to the marine environment as a foundation for further courses in marine biology and ecology. Next, students will choose courses that provide background in the biology of marine organisms, and advanced topics on their interactions with the marine environment, biogeochemistry, and current threats and problems related to marine organisms (e.g., climate change).

The Marine Biology minor is administered by the Department of Natural Resources.

1. Request the Marine Biology Minor Certification Form and email the completed form as an attachment to the Coordinator for Marine Biology Minor, Dr. Matt Hare, with a copy to the Undergraduate Program Coordinator, Suzanne Wapner.
2. During your final semester, before applying to graduate, the fully completed and signed form verifying your fulfillment of requirements should be submitted to the Undergraduate Program Coordinator, Suzanne Wapner with a copy to the Coordinator for Marine Biology Minor, Dr. Matt Hare for approval.

Remember, only courses for which a grade of "C" or better is received will count towards the minor in Marine Biology (courses taken with an "S/U" option will not count).

If you are a student in a college that requires a minor advisor to sign off on your application to graduate, please bring your application to graduate with you at the same time. Please contact Suzanne Wapner with any questions about the minor certification process.

Contacts

- Dr. Matthew Hare
Coordinator for Marine Biology Minor, Fieldwork and Curricular topics
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- Suzanne Wapner
Undergraduate Advising Coordinator
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Program Information

- Minimum Credits for Minor: 15

Minor Requirements

A minimum of 15 Credits total is required from Group A + Group B courses. At least 2 courses in Group B must not be used to 'double count' by also fulfilling the student's major requirements. Courses with the subject BIOSM are at Shoals Marine Station during summer. Courses from the SEA Semester program may also be accepted towards the minor. For more information about the SEA semester program please see the SEA Semester page on Experience (<https://experience.cornell.edu/opportunities/sea-semester-coral-reef-conservation-caribbean>).

Only courses for which a grade of C or better is received will count toward the minor in Marine Biology (Courses with an "S/U" option will not count.)

Several Shoals courses are equivalent to and serve to fulfill on-campus Biology requirements (BIOSM 1500, BIOSM 1610, BIOSM 1780) or CALS Life Science requirements (BIOSM 1650). In other words, double-counting courses for this minor and your major is allowed, but at least two courses in Group B must be outside your major requirements.

Special Cornell marine field programs that will fulfill many of the requirement(s) of the minor:

- Shoals Marine Lab semester program
- Contact Eugene Won

Code	Title	Hours
<i>Group A - Organismal Biology and Foundations</i>		
BIOEE 1540	Introductory Oceanography	3
BIOEE 1560	Introductory Oceanography with Laboratory	4
BIOSM 1500	Investigative Marine Biology Laboratory	3
BIOSM 1610	Ecology and the Marine Environment	3
BIOSM 1780	Evolution and Marine Diversity	4
<i>Group B - Advanced Topics</i>		
BIOAP 3300	Fish Physiology	3
BIOEE 4760	Ichthyology: Biology of Fishes, Lectures	3
BIOEE 4761	Ichthyology: Biology of Fishes, Laboratory	1
BIOEE 4790	Paleobiology	4
BIOMI 3500	Marine Microbes and Disease in a Changing Ocean	3
BIOSM 2500		3
BIOSM 2800	Sustainable Fisheries	3
BIOSM 3210	Anatomy and Function of Marine Vertebrates	3
BIOSM 3290	Field Animal Behavior	3
BIOSM 3330	Marine Parasitology and Disease	3
BIOSM 3450	Marine Mammal Biology	3
BIOSM 3650	Underwater Research	3
BIOSM 3750	Marine Ecosystem Research and Management	3

BIOSM 4650	Shark Biology and Conservation	3
EAS 3540	Ocean Satellite Remote Sensing	3
NTRES 3110	Fish Ecology, Conservation, and Management	3
NTRES 3111	Fish Ecology Laboratory	1

Learning Outcomes

- Understand the diversity of marine organisms, their evolutionary history, biogeography, interactions with other organisms, and adaptations to their environments.
- Be able to form hypotheses about marine-related scientific questions and design and execute experiments to test those hypotheses.
- Be able to synthesize knowledge of physical and chemical processes of oceans and the biology of organisms to ask questions about natural history and ecology.
- Have an appreciation for the impact of habitat perturbation on marine organisms, and subsequent ecosystem-level consequences and feedbacks.