

# AQUACULTURE, AQUARIUM SCIENCE, AND AQUAPONICS, B.S.

## Contact

Bryan Franks, Ph.D.  
Director, School of Marine and Environmental Programs  
bfranks1@une.edu

## Mission

The mission of the School of Marine and Environmental Programs at the University of New England is to help our students gain an understanding of the natural world, develop critical thinking skills, and become scientifically literate. Together, we lay a foundation for lifelong learning and meaningful contributions to society and offer a baccalaureate education to students interested in all facets of the marine environment.

Our programs encompass a wide variety of disciplines that seek to understand the way the ocean functions, how it is related to earth systems science, and how humans interact with the environment. Students will learn theoretical underpinnings and applications of disciplines from biology to chemistry, geology, and physics. These disciplines are critical to life as we know it on the planet. Students will be able to apply these disciplines to solving real problems encountered in coastal and marine ecosystems and by the human communities that depend on them.

## Major Description

The Aquaculture, Aquarium Science, and Aquaponics major provides students the opportunity to develop analytical skills in biology, marine science, and business, and technical skills in the culture and maintenance of marine and freshwater organisms. Students who successfully complete the program should satisfy employment needs in the fields of marine and freshwater aquaculture and in the educational, maintenance and design needs of local, regional and national aquarium museums and businesses. Students who elect to go into graduate programs in these fields should be prepared to do so after maintaining an appropriate GPA in this program.

## Honors

We offer qualified students the option of graduating with Honors. This includes significant research, scholarship or creative activity under the direction of a faculty member. Interested students should consult with their major advisor.

## Transfer Credit

See Undergraduate Admissions (<https://catalog.une.edu/undergraduate/admissions/>) for more information.

## Admissions

See Undergraduate Admissions (<https://catalog.une.edu/undergraduate/admissions/>) for more information.

## Financial Information

Tuition and fees for subsequent years may vary. Other expenses include books and housing. For more tuition and fee information, please consult this catalog's Financial Information (<https://catalog.une.edu/undergraduate/financial-information-undergraduate-programs/>) section.

## Curricular Requirements

Code	Title	Hours
<b>Nor'easter Core Requirements</b>		
Nor'easter Core Requirements ( <a href="https://catalog.une.edu/undergraduate/core-curriculum/">https://catalog.une.edu/undergraduate/core-curriculum/</a> )		40
<b>Program Required Courses</b>		
BIO 214 & 214L	Genetics and Genetics Lab	4
BIO 234 & 234L	Environmental Microbiology and Environmental Microbiology Lab	4
BUMG 313 or BUMK 312	Social Innovation and Entrepreneurship Entrepreneurship/Small Business Management	3
MAR 221	Principles of Aquaculture	3
MAR 222 & 222L	Finfish/Shellfish Culture Tech and Finfish/Shellfish Culture Tech Lab	4
MAR 223 & 223L	Health, Nutrition, Feeding Cultured Organisms and Health, Nutrition, Feeding Cultured Organisms Lab	4
MAR 323 & 323L	Aquarium Science and Operations and Aquarium Science and Operations Lab	4
Select one of the following:		4
CHE 130 & 130L	Principles of Chemistry and Principles of Chemistry Lab	
CHE 150 & 150L	University General Chemistry I and University General Chemistry I Lab	
CHE 110 & 110L	General Chemistry I and General Chemistry I Lab	
CHE 115 & 115L	Chemistry of Nature and Chemistry of Nature Lab (Chemistry of Nature)	
GIS 161	GIS I: Fundamentals of Geospatial Science and Technology	3
MAR 105 & 105L	Ecology and Evolution of Marine Organisms and Eco/Evo of Mar Organisms Lab	4
MAR 106 & 106L	Cellular and Molecular Biology of Marine Organisms and Cell/Molec Bio/Marine Orgs Lab	4
Select one of the following:		4
MAR 150 & 150L	Discovering the Ocean Environment and Discovering the Ocean Environment Lab	
MAR 270 & 270L	Oceanography and Oceanography Lab	
MAR 235	Sustainable Harvest of Aquatic Organisms	3
MAR 250 & 250L	Marine Biology and Marine Biology Lab	4
MAR 305 & 305L	Aquatic Health Management and Aquatic Health Management Lab	4
MAR 495	Adv Marine Science Internship	4
MAT 150	Statistics for Life Sciences	3

or MAT 151	Statistics for Environmental Sciences	
Select one of the following: <sup>1</sup>		3-4
<i>Cellular and Molecular Biology Topic Area Course</i>		
BIO 203	(Histology)	
BIO 290	Biological Topics (may fulfill Biology Area requirements depending on the subject matter and advisor permission.)	
BIO 365	Immunology	
BIO 370	Cell & Molecular Biology	
MAR 220	Cellular & Molecular Approaches in Marine Sciences	
<i>Physiology Topic Area Course</i>		
BIO 208	Intro Anatomy & Physiology I	
BIO 245	Gen Prin Anat/Phys/Pathophys I	
BIO 290	Biological Topics (may fulfill Biology Area requirements depending on the subject matter and advisor permission.)	
BIO 322	Comparative Animal Physiology	
BIO 404	Neuroscience	
MAR 326	(Experimental Animal Physiology)	
MAR 424	(Physiological Ecology of Fish)	
<i>Ecology/Evolutionary Biology Topic Area Course</i>		
BIO 290	Biological Topics (may fulfill Biology Area requirements depending on the subject matter and advisor permission.)	
BIO 307	Conservation Genetics	
BIO 328	Human Evolution	
BIO 333	Evolution	
BIO 350	Ecology	
MAR 335	Animal Behavior and Behavioral Ecology	
MAR 350	Marine Ecology	
Open Elective Courses (Students complete open elective credits as necessary to meet the University's 120-credit minimum for graduation. The total number of elective credits required will depend on the student's completed program, core, and other degree requirements.)		14
<b>Total Hours</b>		<b>120-121</b>

<sup>1</sup> Topic area program required courses are to be selected in consultation with an advisor.

Please note: While some courses can fulfill both core and program requirements, the credits earned do not count twice towards the minimum total required credits for the degree.

### Recommended Elective Credits (Not Required)

Code	Title	Hours
MAF 200	Intro to Marine Pollution	3
MAF 210	Intro to US Ocean Governance	3
MAR 316	Science in Society	3
MAF 315	US Aquaculture Policy and Management	3
PHI 201	Bio-Medical Ethics	3
MAR 399	Special Projects in Aquaculture, Aquarium Science or Aquaponics	4

### Graduation Requirements

A minimum grade of C- must be achieved in all science and mathematics courses used toward graduation in any of the programs in the School of Marine and Environmental Programs. A 2.00 cumulative average in sciences is a requirement for graduation in any of the programs in the School of Marine and Environmental Programs.

Students in this major can participate in the pre-health graduate school preparation tracks. (<https://catalog.une.edu/programs/science-prerequisites-health-professions/>)

### Learning Outcomes

- Students will demonstrate a strong content-knowledge foundation in their specific field of study (Marine Biology, Oceanography, Marine Entrepreneurship, Marine Affairs, or Aquaculture, Aquarium Science, and Aquaponics).
- Students will communicate effectively in both oral and written format to convey their scientific knowledge, interdisciplinary training, and findings to peers, professional audiences, decision-makers, and/or the public.
- Students will demonstrate critical thinking and problem-solving skills in their specific field of study by designing, carrying out, and interpreting the results of their experiments by evaluating the literature published by professionals, by making recommendations to policy makers, and/or by creating and innovating in their field.