Marine Sciences (MAR)

Major and Minor in Marine Sciences

School of Marine and Atmospheric Sciences (SoMAS)

DEAN AND DIRECTOR: David O. Conover  DIRECTOR OF UNDERGRADUATE STUDIES: Mary I. Scranton
ASSISTANT TO THE DIRECTOR: Carol Dovi  EDUCATION OFFICE: 105 Endeavour Hall  PHONE: (631) 632-8681
E-mail: somasgrad@notes.cc.sunysb.edu  Web address: http://www.somas.stonybrook.edu
COORDINATOR OF MAR MAJOR AT STONY BROOK SOUTHAMPTON: Christopher Gobler
OFFICE: Natural Science Building 125  PHONE: (631) 632-5043  E-MAIL: Christopher.Gobler@stonybrook.edu

Faculty

Please see the faculty listing in the entry for the Atmospheric and Oceanic Sciences major. A complete list of faculty including all adjunct faculty can be found on the SoMAS Web site at http://www.somas.stonybrook.edu.

Marine Sciences is a highly interdisciplinary field requiring an understanding and application of basic science, including biology, physics, and chemistry. In particular, the Marine Sciences major provides students with a solid background in basic biology as well as in the physics and chemistry of the ocean. Upper-division electives permit each student to gain a deeper understanding of particular groups of organisms (microorganisms, algae, marine invertebrates, fish, and marine mammals) and of habitats (salt marshes, rocky intertidal, barrier islands, dunes, estuaries, and the open ocean).

Students are encouraged to participate in research and internships. Opportunities for experiential learning are available through field and laboratory courses taught at or near the Stony Brook campus and from a field station at the Stony Brook Southampton campus.

Most students who wish to have a career in research related to the marine environment will need to plan for graduate study. Career possibilities include research, education, or employment in government agencies or non-profit organizations.

The Marine Sciences major is administered by the School of Marine and Atmospheric Sciences, one of the leading oceanographic and atmospheric institutions in the nation.

The major is offered on two campuses—the Stony Brook main campus and at Stony Brook Southampton. All aspects regarding the academic requirements for the major are the same on both campuses.

The School of Marine and Atmospheric Sciences (SoMAS) is Stony Brook University’s center for education, research, and public service in the ocean, atmospheric and environmental sciences. Housed within the SoMAS are the Marine Sciences Research Center (MSRC) and the Institute for Terrestrial and Planetary Atmospheres (ITPA). MSRC is the only state-designated center for marine research, education, and public outreach within the State University of New York system. The SoMAS is one of the nation’s leading coastal oceanographic and atmospheric institutions, and the expertise of the SoMAS faculty places SBU at the forefront of addressing and answering questions about regional environmental problems, as well as problems relating to the global ocean and atmosphere. The primary focus of the SoMAS faculty is on fundamental research designed to increase understanding of the processes that characterize the coastal ocean and the atmosphere. The SoMAS is also committed to applying the results of research to solve problems arising from society’s uses and misuses of the environment. The SoMAS includes mission-oriented institutes in several major areas: the Institute for Terrestrial and Planetary Atmospheres, the Living Marine Resources Institute, the Institute for Ocean Conservation Science, the Long Island Groundwater Resource Institute, and the Waste Reduction and Management Institute. These institutes and many research projects add a wealth of varied resources to education and research at Stony Brook.

The SoMAS offers undergraduate majors in atmospheric and oceanic sciences, environmental studies, marine sciences, and marine vertebrate biology, and minors in environmental studies and marine sciences. See the separate entries for atmospheric and oceanic sciences (ATM), environmental studies (ENS), and marine vertebrate biology (MVB) in the alphabetical listings of Approved Majors, Minors, and Programs. The SoMAS also offers several cooperative programs in both marine and environmental sciences with departments in the College of Arts and Sciences (Chemistry, Geosciences) and the College of Engineering and Applied Sciences (Chemical and Molecular Engineering).

All students should consult with the appropriate faculty advisor based on the location in which they are studying. Students on the main campus should contact the director of undergraduate studies to design and approve an acceptable course of study before declaring the major. Students at Stony Brook Southampton should consult with the Southampton Coordinator to discuss the academic options at the Southampton campus.

For more information about the Southampton campus, please read the Introduction to Stony Brook section of this Bulletin, or visit http://www.stonybrook.edu/southampton. Students may learn more about the School of Marine and Atmospheric Sciences by visiting http://www.somas.stonybrook.edu.

Research opportunities in marine sciences, atmospheric sciences, and waste management are available to undergraduates. Information on research opportunities may be found by contacting faculty directly or on the SoMAS Web site at http://www.somas.stonybrook.edu.

All students should consult with the director of undergraduate studies to design and approve an acceptable course of study before declaring the major.

Courses Offered in Marine Sciences

See the Course Descriptions listing in this Bulletin for complete information.

MAR 101-E Long Island Sound: Science and Use
MAR 104-E Oceanography
Sample Course Sequence for the Major in Marine Sciences

<table>
<thead>
<tr>
<th>Freshman Fall</th>
<th>Credits</th>
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<tr>
<td>First Year Seminar 101</td>
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<td>D.E.C.</td>
<td>3</td>
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<tr>
<td>CHE 131</td>
<td>4</td>
</tr>
<tr>
<td>CHE 133</td>
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</tr>
<tr>
<td>MAT 125</td>
<td>3</td>
</tr>
<tr>
<td>D.E.C.</td>
<td>3</td>
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<tr>
<td>AMS 110</td>
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<tr>
<td>CHE 321</td>
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<tr>
<td>D.E.C.</td>
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<td>BIO 202</td>
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<td>MAR 352/353</td>
<td>3</td>
</tr>
<tr>
<td>ENS/PHY 119</td>
<td>4</td>
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<tr>
<td>D.E.C.</td>
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<table>
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<th>Senior Fall</th>
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<tbody>
<tr>
<td>MAR 305</td>
<td>3</td>
</tr>
<tr>
<td>MAR 351</td>
<td>3</td>
</tr>
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<td>Elective</td>
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<tr>
<td>Elective</td>
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<tr>
<td>Upper-Division D.E.C.</td>
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Requirements for the Major in Marine Sciences (MAR)

The major in Marine Sciences leads to a Bachelor of Sciences degree. Completion of the major requires between 69 and 72 credits. Of these, no more than one course (4 credits) with a grade lower than C can be credited to the major.

1. Foundation Courses (41-42 credits)
   - BIO 201 Organisms to Ecosystems
   - BIO 202 Molecular and Cellular Biology
   - BIO 203 Cellular and Organ Physiology
   - BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I
   - BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II
   - CHE 131/133, 132/134 General Chemistry and Lab (see Note 1)
   - CHE 321 Organic Chemistry
   - MAT 125, 126 Calculus (see Note 2)
   - ENS/PHY 119 Physics for Environmental Studies or PHY 121/123 Physics for Life Sciences with Lab (see Note 3)
   - AMS 102 or AMS 110 Statistics

2. Oceanography Core (13 credits)
   - MAR 349 Biological Oceanography
   - MAR 352 Introduction to Physical Oceanography
   - MAR 353 Physical Oceanography Laboratory
   - MAR 351 Introduction to Ocean Chemistry
   - MAR 350 Introduction to Ocean Chemistry

3. Marine Biology (15-17 credits)
   - MAR 370 Marine Mammals
   - MAR 371 The Biology and Conservation of Marine Birds and Sea Turtles
   - MAR 375 Marine Mammal and Sea Turtle Rehabilitation
   - MAR 380 Ichthyology
   - MAR 384 Diseases of Aquatic Organisms
   - MAR 385 Principles of Fishery Biology and Management
   - MAR 388 Tropical Marine Ecology
   - MAR 392-H Waste Management Issues
   - MAR 393 Treatment Technology
   - MAR 394-H Environmental Toxicology and Public Health
   - MAR 395 Topics in Marine Environmental Sciences
   - MAR 447 Readings in Marine Science
   - MAR 475 Undergraduate Teaching Practicum
   - MAR 487 Research in Marine Sciences
   - MAR 488 Internship

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Four marine biology electives from below:
- BIO 343 Invertebrate Zoology
- BIO 346 Aquatic Arthropods and Vertebrates
- MAR 301 Environmental Microbiology
  or MAR 302 Marine Microbial Ecology
- MAR 303 Long Island Marine Habitats
- MAR 315 Conservation Biology
- MAR 320 Limnology
- MAR 366 Plankton Ecology
- MAR 370 Marine Mammals
- MAR 371 Marine Birds and Turtles
- MAR 380 Ichthyology
- MAR 385 Fisheries Biology
- MAR 388 Tropical Marine Ecology
- MAR 394 Environmental Toxicology and Public Health
- MAR 487 Research or MAR 488 Internship (maximum of three credits can be used for required elective)

Other classes may be substituted with permission of undergraduate director

4. Upper-Division Writing Requirement
All students in the major must submit two papers from any upper division course in the major to the director of undergraduate programs for evaluation by the end of the junior year.

Notes:
1. CHE 141/143, 142/144 Honors Chemistry and Lab may be substituted for CHE 131/133, 132/134
2. MAT 131, 132 or MAT 141, 142 or MAT 171 may be substituted for MAT 125, 126
3. The first semester of any calculus-based Physics with lab can be substituted, such as PHY 125 or 131/133 or 141 or 142.

Requirements for the Minor in Marine Sciences (MAR)
The minor in Marine Sciences is open to students who either wish to prepare themselves for future graduate education in marine sciences or who are preparing for a career in a marine-related field. The minor, which is interdisciplinary in nature, provides a foundation in marine aspects of biology, chemistry, geology, and physics for the undergraduate. Intended primarily for science majors, the minor assumes completion of basic courses in mathematics, physics, chemistry, biology, or geology. No more than three credits of courses taken under the Pass/No Credit option may be applied toward the minor. Completion of the minor requires 18 credits.

1. MAR 101 or 104
2. At least 15 credits from the following:
   Upper-division MAR courses
   - BIO 343
   - BIO/GEO 353
Note: No more than three credits each of MAR 487 and MAR 488 may be applied toward this requirement.