MARINE SCIENCES | CALS

Oceans are an important facet of our global environment; covering more than 70% of the Earth’s surface, oceans provide us with food, transport, and resources, and they play a significant role in controlling climate. However, the world’s oceans remain largely unexplored below the surface, making them one of the last great frontiers for scientific discovery. Marine environments are inherently dynamic and governed by a broad suite of interactive biological, chemical, and physical processes.

About this Program
- **College:** Agricultural and Life Sciences
- **Degree:** Bachelor of Science
- **Credits for Degree:** 120
- **Additional Information**
- **Related Marine Sciences Programs**

To graduate with this major, students must complete all university, college, and major requirements.

Equivalent critical-tracking courses as determined by the State of Florida are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student’s academic record and scheduling availability of courses. Prerequisites still apply.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Semester One</td>
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<tr>
<td>CHM 2045 &amp; 2045L</td>
<td>General Chemistry 1</td>
<td>4</td>
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<tr>
<td></td>
<td>and General Chemistry 1 Laboratory (Critical Tracking: State Core Gen Ed Biological and Physical Sciences)</td>
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<tr>
<td>IUF 1000</td>
<td>What is the Good Life (Gen Ed Humanities)</td>
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<tr>
<td>OCE 1001</td>
<td>Introduction to Oceangraphy (Critical Tracking: Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>State Core Gen Ed Social and Behavioral Sciences</td>
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<tr>
<td>Elective</td>
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<tr>
<td>Semester Two</td>
<td></td>
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<tr>
<td>CHM 2046 &amp; 2046L</td>
<td>General Chemistry 2</td>
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<td></td>
<td>and General Chemistry 2 Laboratory (Critical Tracking: Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus 1 (Critical Tracking: State Core Gen Ed Mathematics)</td>
<td>4</td>
</tr>
<tr>
<td>State Core Gen Ed Composition; Writing Requirement</td>
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<td>3</td>
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<tr>
<td>State Core Gen Ed Humanities</td>
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<tr>
<td>Semester Three</td>
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<tr>
<td>Select one:</td>
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<tr>
<td>AEB 3103</td>
<td>Principles of Food and Resource Economics</td>
<td></td>
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<tr>
<td>ECO 2023</td>
<td>Principles of Microeconomics</td>
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<tr>
<td>ECO 2013</td>
<td>Principles of Macroeconomics (Gen Ed Social and Behavioral Sciences)</td>
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<tr>
<td>BSC 2010 &amp; 2010L</td>
<td>Integrated Principles of Biology 1</td>
<td>4</td>
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<tr>
<td></td>
<td>and Integrated Principles of Biology Laboratory 1 (Critical Tracking: Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>Gen Ed Composition; Writing Requirement</td>
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<td>3</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2 (recommended elective)</td>
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<tr>
<td>Semester Four</td>
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<tr>
<td>BSC 2011 &amp; 2011L</td>
<td>Integrated Principles of Biology 2</td>
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<tr>
<td></td>
<td>and Integrated Principles of Biology Laboratory 2 (Critical Tracking: Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>PHY 2004 &amp; 2004L</td>
<td>Applied Physics 1</td>
<td>4</td>
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<td></td>
<td>and Laboratory for Applied Physics 1 (Critical Tracking: Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>STA 2023</td>
<td>Introduction to Statistics 1 (Gen Ed Mathematics)</td>
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</table>

Students are expected to complete the writing requirement while in the process of taking the courses below. Students are also expected to complete the general education international (GE-N) and diversity (GE-D) requirements concurrently with another general education requirement (typically, GE-C, H or S).
FAS 2024 Global and Regional Perspectives in Fisheries (Recommended elective) 3

Semester Five
AEC 3033C or SPC 2608 Effective Oral Communication or Introduction to Public Speaking 3
Select one:
FNR 3410C Natural Resource Sampling
STA 3024 Introduction to Statistics 2
STA 4210 Regression Analysis
STA 4222 Sample Survey Design
CHM 2200 Fundamentals of Organic Chemistry
& 2200L and Fundamentals of Organic Chemistry Laboratory (recommended electives)
Approved electives 3

Semester Six
FAS 4932 Topics in Fisheries and Aquatic Sciences (Invasion Ecology of Aquatic Animals) 3
PCB 4043C General Ecology 4
PCB 4674 Evolution 4
VME 4012 Aquatic Animal Conservation Issues 3
VME 4906 Problems in Veterinary Science (Introduction to Marine Wildlife) 3
WIS 3553C Introduction to Conservation Genetics 4
WIS 4203C Landscape Ecology and Conservation 3
ZOO 4403C Marine Biology 4

Economics and Human Dimensions
Code Title Credits
AEB 3450 Introduction to Natural Resource and Environmental Economics 3
FOR 3202 Society and Natural Resources (Gen Ed Social and Behavioral Sciences) 3
GEO 4300 Environmental Biogeography 3
SYD 4510 Environment and Society 3
WIS 4523 Human Dimensions of Natural Resource Conservation 3

Physical/Chemical Oceanography
Code Title Credits
EGN 4932 Special Topics (Physical Oceanography) 3
GLY 3074 Oceans and Global Climate Change (Gen Ed Physical Sciences) 3
GLY 4734 Coastal Morphology and Processes 3
GLY 4930 Special Topics in Geology (Geochemical Oceanography) 3
OCE 3016 Introduction to Coastal and Oceanographic Engineering 3

Professional Skills
Code Title Credits
GIS 3072C Geographic Information Systems 3
Advanced Open Water and Science Diving Practicum or Internship

Quantitative Ecological Skills
Code Title Credits
FAS 4932 Topics in Fisheries and Aquatic Sciences (Applied Fisheries Statistics) 4
FNR 3410C Natural Resource Sampling 3
STA 3024 Introduction to Statistics 3
STA 4210 Regression Analysis 3
STA 4211 Design of Experiments 3
STA 4222 Sample Survey Design 3
WIS 4501 Introduction to Wildlife Population Ecology 3
WIS 4601C Quantitative Wildlife Ecology 3

Approved Electives: 18 Credits Minimum
Students meet with a faculty advisor to establish a curriculum plan for approved electives and planned electives and may focus these toward a specific area or a minor. For a broader program, students should choose a minimum of three credits from each area of approved electives. Other options may include study abroad courses.

Ecology and Organismal Biology
Code Title Credits
FAS 2024 Global and Regional Perspectives in Fisheries 3
FAS 4305C Introduction to Fishery Science 3
FAS 4305C Introduction to Fishery Science 3
FAS 4932 Topics in Fisheries and Aquatic Sciences (Aquatic Invertebrate Ecological Physiology) 3
FAS 4932 Topics in Fisheries and Aquatic Sciences (Field Ecology of Aquatic Organisms) 4
FAS 4932 Topics in Fisheries and Aquatic Sciences (Coral Reef Ecology) 3

Additional Approved Electives
With instructor permission
Code Title Credits
FAS 6337C Fish Population Dynam 4
GLY 6075 Glob Climate Change 3
OCP 6295 Estuar/Shelf Hydro 1 3

1 Use as an approved elective if not used to meet the quantitative requirement in semester seven.
This interdisciplinary studies major provides integrative understanding of the basic concepts, theories and observational findings related to marine materials and processes, geologic time, the diversity of marine life, the structure and function of marine organisms and ecosystems and marine resource management.

The marine sciences major is administered jointly by the College of Agricultural and Life Sciences and the College of Liberal Arts and Sciences and utilizes faculty, courses and resources of the Fisheries and Aquatic Sciences Program (CALS), the Department of Geological Sciences (CLAS), the Department of Biology (CLAS), and the Department of Civil and Coastal Engineering (Herbert Wertheim College of Engineering).

Before Graduating Students Must

- Achieve a passing score on the subject test. The content of the examination has been reviewed and approved by the Marine Sciences Committee.
- Achieve a passing score on the analytical skills test. The content of the examination has been reviewed and approved by the Marine Sciences Committee.
- Achieve a passing score on the bioethics quiz. The content of the examination has been reviewed and approved by the Marine Sciences Committee.
- Achieve a passing score on the scientific literacy paper. This paper is assessed using a rubric that has been reviewed and approved by the Marine Sciences Committee.
- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to

Student Learning Outcomes (SLOs)

Content

1. Demonstrate competence in the basic terminology, concepts, methodologies and theories used within the marine sciences.

Critical Thinking

2. Analyze information in the marine sciences and develop reasoned solutions to problems using the processes and applications of scientific inquiry.
3. Discriminate ethical behavior from unethical behavior in scientific research.

Communication

4. Communicate knowledge, ideas and reasoning clearly, effectively and objectively in written or oral forms appropriate to the marine sciences.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

<table>
<thead>
<tr>
<th>Courses</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
<th>SLO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAS 4202C</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>FAS 4932 (Biology and Ecology of Algae)</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
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<tr>
<td>GLY 3083C</td>
<td>I</td>
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<td>I</td>
<td>I</td>
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<tr>
<td>OCE 1001</td>
<td>I</td>
<td>I</td>
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<tr>
<td>ZOO 4205C</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>ZOO 4926 (Marine Ecology) or FAS 4932 (Marine Ecological Processes)</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>

Assessment Types

- Marine sciences subject and analytical skills tests
- Bioethics quiz
- Scientific paper