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 Common Core tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

Critical Tracking records each student’s progress in courses that 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>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 2045 &amp; 2045L</td>
<td>General Chemistry 1 and General Chemistry 1 Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>IUF 1000</td>
<td>What is the Good Life (Gen Ed Humanities)</td>
<td>3</td>
</tr>
<tr>
<td>OCE 1001</td>
<td>Introduction to Oceangraphy</td>
<td>3</td>
</tr>
<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus 1</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>AEB 3103</td>
<td>Principles of Food and Resource Economics</td>
<td>4</td>
</tr>
<tr>
<td>ECO 2023</td>
<td>Principles of Microeconomics</td>
<td>4</td>
</tr>
<tr>
<td>ECO 2013</td>
<td>Principles of Macroeconomics (Gen Ed Social and Behavioral Sciences)</td>
<td>4</td>
</tr>
<tr>
<td>BSC 2010 &amp; 2010L</td>
<td>Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1</td>
<td>4</td>
</tr>
<tr>
<td>Gen Ed Composition; Writing Requirement</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>BSC 2011 &amp; 2011L</td>
<td>Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2</td>
<td>4</td>
</tr>
<tr>
<td>PHY 2004 &amp; 2004L</td>
<td>Applied Physics 1 and Laboratory for Applied Physics 1</td>
<td>4</td>
</tr>
<tr>
<td>STA 2023</td>
<td>Introduction to Statistics 1</td>
<td>3</td>
</tr>
</tbody>
</table>

Semester One
- Complete OCE 1001 and 1 of the following, excluding labs:
  - BSC 2010/BSC 2010L, BSC 211L/CHM 2045/CHM 2045L
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester Two
- Complete 2 additional critical-tracking courses, excluding labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester Three
- Complete 1 additional critical-tracking course, excluding labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester Four
- Complete 2 additional critical-tracking courses, excluding labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester Five
- Complete all critical-tracking courses, including labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

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).

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.
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:  3
  FNR 3410C  Natural Resource Sampling
  STA 3024  Introduction to Statistics 2
  STA 4210  Regression Analysis
  STA 4222  Sample Survey Design
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  3

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 2  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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>FAS 2024</td>
<td>Global and Regional Perspectives in Fisheries</td>
<td>3</td>
</tr>
<tr>
<td>FAS 4305C</td>
<td>Introduction to Fishery Science</td>
<td>3</td>
</tr>
<tr>
<td>FAS 4305C</td>
<td>Introduction to Fishery Science</td>
<td>3</td>
</tr>
<tr>
<td>FAS 4932</td>
<td>Topics in Fisheries and Aquatic Sciences (Aquatic Invertebrate Ecological Physiology)</td>
<td>3</td>
</tr>
<tr>
<td>FAS 4932</td>
<td>Topics in Fisheries and Aquatic Sciences (Field Ecology of Aquatic Organisms)</td>
<td>4</td>
</tr>
<tr>
<td>FAS 4932</td>
<td>Topics in Fisheries and Aquatic Sciences (Coral Reef Ecology)</td>
<td>3</td>
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</tbody>
</table>

1  Use as an approved elective if not used to meet the quantitative requirement in semester seven.

Additional Approved Electives

*With instructor permission*

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAS 6337C</td>
<td>Fish Population Dynam</td>
<td>4</td>
</tr>
<tr>
<td>GGY 6075</td>
<td>Glob Climate Change</td>
<td>3</td>
</tr>
<tr>
<td>OCP 6295</td>
<td>Estuar/Shef Hydro 1</td>
<td>3</td>
</tr>
</tbody>
</table>
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**

<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>
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<tr>
<td>FAS 4932 (Biology and Ecology of Algae)</td>
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<td>R</td>
<td>R</td>
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</tr>
</tbody>
</table>

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