Marine Biology studies life processes of organisms inhabiting saltwater environments—from genetics and evolution to physiological traits and ecosystem functioning. The major is focused on the intersection of marine sciences taught in Oceanography and Aquatic and Fishery Sciences, and all students complete an integrative field experience: a research or field course offered at our marine field station, Friday Harbor Labs. Graduates of Marine Biology are prepared for careers in management agencies at the local to international levels, environmental consulting, non-profit organizations and a range of educational settings. Completing the minimum general education and major requirements for a Bachelor of Science with a Major in Marine Biology requires 106–113 credits.

DECLARE A MAJOR IN MARINE BIOLOGY
Marine Biology is an open major that can be declared at any time by currently enrolled UW undergraduates. To declare the major, set up an appointment with a Marine Biology Academic Adviser at https://marinebiology.uw.edu/students/advising/.

COLLEGE OF THE ENVIRONMENT GENERAL EDUCATION

Basic Skills (Credits vary)
English Composition “C” (5) *
- ______________________
Writing “W” (10) 8–10 credits fulfilled with major requirements
- MARBIO 305 (3) or FHL 333 (3–5)
- FISH 323 (5)
- Possible additional 2 credits needed *
Reasoning “RSN” (10) Fulfilled by Math requirements *
- MATH 124/Q SCI 291
- MATH 125/Q SCI 292
Diversity “DIV” (5) can overlap with AoI *
- ______________________

Areas of Inquiry (AoI) (60 credits)
Arts and Humanities “A&H” (10 credits) *
- ______________________
- ______________________
- ______________________

Social Sciences “SSc” (20 credits) *
- ______________________
- ______________________
- ______________________

Natural Sciences “NSc” (20 total) 10 credits of NSc must be outside the major (i.e., not a major prefix and no overlap with major) *
- ______________________
- ______________________
- Fulfilled with Foundation Courses in Science and Mathematics
- Fulfilled with Foundation Courses in Science and Mathematics

10 additional AoI credits from any category
- Fulfilled with Foundation Courses in Science and Mathematics
- Fulfilled with Foundation Courses in Science and Mathematics

* Equivalent course options available at Washington State Community Colleges.
FOUNDATION COURSES IN SCIENCE AND MATHEMATICS (48–55 credits)

Chemistry (10–15 credits)
Choose one of the following sequences:

Two Course Series
- CHEM 120 Principles of Chemistry I (5) * Prerequisite: completion of CHEM Placement Exam   Offered: Su, A and one of:
  - CHEM 220 Principles of Chemistry II (5) * Offered: W
  - OCEAN 295 Chemistry of Marine Organic Carbon (5) offered: W, Sp

or:
Three-Four Course Series
Possible Prequisite of Chem 110—see CHEM Placement Test
- CHEM 142 General Chemistry I (5) **
- CHEM 152 General Chemistry II (5) *
and one of:
- CHEM 223 Organic Chemistry—Short Program I (4) Offered: Su, A

Biology (15 credits)
- BIOL 180 Introductory Biology I (5) **
- BIOL 200 Introductory Biology II (5) **
  - Prereq Part 1: Minimum grade of 1.7 in BIOL 180
  - Prereq Part 2:
    - Passed CHEM 143, CHEM 145, CHEM 223, 237, or OCEAN 295
    - Concurrently taking either CHEM 220, CHEM 152, CHEM 153, or CHEM 155
and one of:
- BIOL 220 Introductory Biology III (5) **
- MARBIO/FISH/OCEAN 270 Aquatic Ecophysiology (5) Offered: W

Statistics (5 Credits)
Choose one:
- Q SCI 381 Introduction to Probability and Statistics (5) Prerequisite of either MATH 120, MATH 124, or Q SCI 291 *
- STAT 311 Elements of Statistical Methods (5) Prerequisite: either STAT 220, STAT 221, STAT 290, MATH 120, MATH 124 *

Math (10 credits)
Choose one of the following sequences:
Possible Prequisite of MATH 120 depending on Math Guided Self Placement
- MATH 124 Calculus with Analytic Geometry I (5) **
- MATH 125 Calculus with Analytic Geometry II (5) **

or:
Possible pre-req of MATH 120 depending on Math Guided Self Placement
- Q SCI 291 Analysis for Biologists I (5) Offered: A, W
- Q SCI 292 Analysis for Biologists II (5) Offered: W, Sp

Physics (8–10 credits)
Choose one of the following sequences:
- PHYS 114 General Physics (4) **
- PHYS 115 General Physics II (4) **

or:
- PHYS 121 Mechanics (5) ** Prerequisite: either MATH 124 or MATH 134, which may be taken concurrently.
- PHYS 122 Electromagnetism (5) ** Prerequisite: either MATH 125 or MATH 134, which may be taken concurrently.

or:
- PHYS 114/PHYS 121 Gen. Physics I/Mechanics (4–5) * See above
- OCEAN 285 and 286 Physics Across Oceanography: Fluid Mechanics and Waves with Lab (3, 2) offered: A

* Equivalent course options available at Washington State Community Colleges.
* Offered A, W, Sp, Su
Communication (3 credits)

Choose one:

- MARBIO 305  Scientific Writing in Marine Biology (3)  Prereq: one course meeting the “English Composition” requirement.  Offered: W, Sp
- FHL 333  Science Writing for Diverse Audiences (3/5)  Offered: Sp

Oceanography (4 credits):

- OCEAN 210  Integrative Oceans (4)  Prerequisite: either FISH/OCEAN/BIOL 250 or OCEAN 200.  Offered: A, Sp

Marine Biology Core (15 credits)

- FISH 323  Conservation and Management of Aquatic Resources (5)  Offered: W
- MARBIO/FISH/OCEAN 370  Marine Evolutionary Biology (5)  Prereq: either BIOL 220 or MARBIO/FISH/OCEAN 270.  Offered: Sp
- OCEAN 330  Marine Biogeochemical Cycles (5)  Prereq: OCEAN 210; BIOL 200; and Organic Chemistry  Offered: Sp

Electives (25 credits)

Review the department's approved elective list at marinebiology.uw.edu.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Course</th>
<th>Credits</th>
<th>Lab</th>
<th>400-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td></td>
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<td></td>
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<tr>
<td>One course</td>
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<tr>
<td>Ecology and Ecosystems</td>
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<td></td>
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<tr>
<td>One course</td>
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<tr>
<td>Organismal Processes</td>
<td></td>
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<tr>
<td>One course</td>
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<tr>
<td>Other Electives</td>
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<tr>
<td>(Additional courses to</td>
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<tr>
<td>bring total to 25 credits)</td>
<td></td>
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</tr>
</tbody>
</table>

Lab: Check two courses from your list taken with a lab section

400-level: Check three courses from your list taken at the 400-level

Research: Maximum of 6 credits of independent research

Integrative Field Experience (IFE) (6 credits)

Review the department's approved list at marinebiology.uw.edu. Culminating requirement of the major. All courses require time in the field away from the UW Seattle campus, and most are offered at the UW's marine field station Friday Harbor Labs (FHL). Research or field courses at other marine field stations, labs, or study abroad programs have the possibility of petition.
## Marine Biology Major Electives

For most up to date listing of offerings see website. Course offerings subject to change. Courses highlighted in yellow are Friday Harbor Lab courses.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Credits/Lab</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biodiversity (1 course minimum)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 434</td>
<td>Invertebrate Zoology</td>
<td>5</td>
<td>Variable</td>
</tr>
<tr>
<td>FISH 310</td>
<td>Biology of Shellfishes</td>
<td>5</td>
<td>Spring</td>
</tr>
<tr>
<td>FISH/BIOL 311</td>
<td>Biology of Fishes</td>
<td>5</td>
<td>Autumn</td>
</tr>
<tr>
<td>FHL 375</td>
<td>Marine Mammals of the Salish Sea</td>
<td>5</td>
<td>Spring</td>
</tr>
<tr>
<td>FHL 430/BIO 430</td>
<td>Marine Zoology</td>
<td>5</td>
<td>Spring</td>
</tr>
<tr>
<td>FHL 440/BIO 445</td>
<td>Marine Botany</td>
<td>5</td>
<td>Spring</td>
</tr>
<tr>
<td>FHL 446</td>
<td>Marine Botany: Diversity and Ecology</td>
<td>9</td>
<td>Summer</td>
</tr>
<tr>
<td>FHL/BIO 432</td>
<td>Marine Invertebrate Zoology</td>
<td>9</td>
<td>Summer</td>
</tr>
<tr>
<td><strong>Ecology and Ecosystems (1 course minimum)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 423</td>
<td>Marine Ecological Processes</td>
<td>3</td>
<td>Variable</td>
</tr>
<tr>
<td>FISH 406</td>
<td>Parasite Ecology</td>
<td>5</td>
<td>Autumn</td>
</tr>
<tr>
<td>FISH 450</td>
<td>Salmonid Behavior and Life History</td>
<td>4</td>
<td>Autumn</td>
</tr>
<tr>
<td>FISH 464</td>
<td>Arctic Marine Vertebrate Ecology</td>
<td>5</td>
<td>Winter, odd years</td>
</tr>
<tr>
<td>MARBIO/BIO 433</td>
<td>Marine Ecology</td>
<td>5</td>
<td>Variable</td>
</tr>
<tr>
<td><strong>Organismal Processes (1 course minimum)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FISH/BIO 340</td>
<td>Genetics and Molecular Ecology</td>
<td>5</td>
<td>Autumn</td>
</tr>
<tr>
<td>FISH 427</td>
<td>Tropical Marine Biology</td>
<td>5</td>
<td>Winter</td>
</tr>
<tr>
<td>FISH 441</td>
<td>Integrative Environmental Physiology</td>
<td>3/5</td>
<td>Autumn</td>
</tr>
<tr>
<td>FISH 444</td>
<td>Conservation Genetics</td>
<td>5</td>
<td>Spring</td>
</tr>
<tr>
<td>OCEAN 432</td>
<td>Microbes in a Changing Ocean</td>
<td>3</td>
<td>Winter</td>
</tr>
<tr>
<td>FHL 471</td>
<td>Comparative Anatomy &amp; Physiology of Marine Organisms</td>
<td>5</td>
<td>Autumn</td>
</tr>
<tr>
<td><strong>Other Electives (Additional courses to a total of 25 credits)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FISH 312</td>
<td>Fisheries Ecology</td>
<td>3/5</td>
<td>Spring</td>
</tr>
<tr>
<td>FISH 478</td>
<td>Topics in Sustainable Fisheries</td>
<td>3</td>
<td>Winter</td>
</tr>
<tr>
<td>MARBIO 301</td>
<td>Current Topics in Marine Biology</td>
<td>1</td>
<td>Winter</td>
</tr>
<tr>
<td>MARBIO 302</td>
<td>Conversations in Marine Biology</td>
<td>1</td>
<td>Winter</td>
</tr>
<tr>
<td>OCEAN 402</td>
<td>Advanced Marine Biogeochemical Processes</td>
<td>3</td>
<td>Winter</td>
</tr>
<tr>
<td>OCEAN 409</td>
<td>Marine Pollution</td>
<td>3</td>
<td>Spring</td>
</tr>
<tr>
<td>OCEAN 480</td>
<td>Global Ocean - Human Culture</td>
<td>3</td>
<td>Winter</td>
</tr>
<tr>
<td>Q SCI/FISH 454</td>
<td>Introduction to Quantitative Ecology</td>
<td>5</td>
<td>Winter</td>
</tr>
<tr>
<td>Q SCI/FISH 458</td>
<td>Advanced Ecological Modeling</td>
<td>5</td>
<td>Spring</td>
</tr>
<tr>
<td>FHL 490</td>
<td>Marine Sciences Seminar</td>
<td>1</td>
<td>Autumn &amp; Spring</td>
</tr>
<tr>
<td><strong>Research Courses (Maximum of 6 credits)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MARBIO 479</td>
<td>Research in Marine Biology</td>
<td>1–15</td>
<td></td>
</tr>
<tr>
<td>FHL 470</td>
<td>Research in Marine Biology</td>
<td>6</td>
<td>Autumn &amp; Spring</td>
</tr>
<tr>
<td><strong>Special Topics (Approved by individual offering; see website for details)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FISH 497</td>
<td>Special Topics in Aquatic and Fishery Sciences</td>
<td>1–15</td>
<td></td>
</tr>
<tr>
<td>FHL 472</td>
<td>Friday Harbor Labs Research Apprenticeship</td>
<td>15</td>
<td>Autumn</td>
</tr>
<tr>
<td>FHL 468</td>
<td>Advanced Topics in Ecology and Biomechanics</td>
<td>9</td>
<td>Summer</td>
</tr>
</tbody>
</table>

*meets lab requirement

*must take 5 cr. section to meet lab requirement
INTEGRATIVE FIELD EXPERIENCE (6 credits)
Culminating requirement of the major. Students select from a list of courses that give hands-on experiences with changes in the marine environment at a variety of scales (time & space) and systems (physical & biological).

- All courses require time in the field away from the UW Seattle campus, and most are offered at the UW's marine field station Friday Harbor Labs (FHL).
- All majors must complete 6 credits through a qualifying course; additional credits earned in the field may qualify for other Marine Biology Major requirements.
- Courses are offered at varying times of year with time spent away from campus ranging from a minimum of three weeks to a full academic quarter.

IFE Priority Application
UW Marine Biology and Friday Harbor Labs administer an annual 'IFE Priority Application' in the month of January for all eligible courses offered in the upcoming 18 months.

Eligibility for Priority Application
- Current declared major in Marine Biology.
- Have not yet completed the IFE requirement with another course.
- Must either have completed or be set to complete the following by the quarter you take your IFE course:
  - Introductory Marine Science: OCEAN 210
  - Physiology: FISH/OCEAN/MARBIO 270 or BIOL 220
  - Communications: MARBIO 305 or FHL 333
  - Statistics: Q SCI 381 or STAT 311
  - 3 upper-division courses for electives/core, one of which must be a core course

IFE Options

Spring
Zoo-Bot Program (16–17 credits): Full-term spring (approximately 10 weeks)
Students enroll in three courses (FHL 430: Marine Zoology, FHL 440, Marine Botany and FHL 470: Research in Marine Biology) with an optional 1 credit seminar (FHL 490). Students earn major elective credits in addition to the IFE requirement.

Summer
FHL 468: Advanced Topics in Ecology & Biomechanics (9 credits): Half-term summer (approximately 4.5 weeks)
Students enroll in a single, nine-credit course. Topics vary by section and year, and eligible courses are approved annually. Approved courses complete the six-credit integrative field experience requirement with the remaining three credits applied to ‘other marine biology elective’.
FHL 492: Ecology & Conservation of Marine Birds & Mammals (9 credits)
Half-term summer (approximately 4.5 weeks). Students enroll in a single, nine-credit course. Offered every other summer in “odd years.” Students earn 3 credits of major elective in addition to the IFE requirement.

Early Fall
MARBIO 488: Marine Biology in the Field (6 credits) Three weeks prior to the start of fall quarter (exact dates vary by year). Offered annually in the fall.

Fall
Autumn Marine Studies (16-17 credits): Full-term fall quarter (approximately 10 weeks)
Students enroll in three courses (FHL 469: Ecology and Human Interactions in the Salish Sea, FHL 471: Comparative Anatomy and Physiology of Marine Organisms and FHL 470: Research in Marine Biology) with an optional 1 credit seminar (FHL 490). Students earn major elective credits in addition to the integrative field experience requirement.
Research Apprenticeship: FHL Apprenticeship (15 credits): Full-term fall quarter (approximately 10 weeks)
Students engage in advanced undergraduate research in a small cohort of students. Topics vary by section and year, and eligible apprenticeships are approved on a section basis. Approved apprenticeships complete the six-credit integrative field experience requirement, with six additional credits applied to ‘other marine biology elective’ and the remaining three credits applied to “non major elective.”