B.S. IN MARINE AND COASTAL SCIENCE

The B.S. in Marine and Coastal Science (MACS) is a new cohort-based, interdisciplinary, and experiential program designed to provide students with the opportunity to engage in coastal and marine-focused research. Active learning experiences help students develop into confident, thoughtful, ethical scientists who are ready to address the growing challenges affecting marine and coastal environments.

Each year, a new cohort of students begins the program, engaging in hands-on research and learning experiences in and around the Salish Sea, with opportunities for focused, residential study at Western’s Shannon Point Marine Center (SPMC) in Anacortes, about an hour from the main campus in Bellingham.
**PROGRAM FEATURES**

**STUDY MARINE SCIENCE ACROSS DISCIPLINES**
The new MACS major is a partnership between three existing academic departments (Biology, Geology, and Environmental Sciences) and Shannon Point Marine Center. You will have a unique opportunity to study marine science in an environment of interdisciplinary collaboration.

**LEARN, WORK, AND THRIVE TOGETHER**
Study marine science as a cohort, beginning with a research experience in your second year, and continuing through the third year with the core course series, and culminating with a capstone project in your final year.

**GAIN RESEARCH EXPERIENCE**
You will have opportunities to engage in mentored, hands-on research opportunities in your sophomore year through immersive study at the marine center in Anacortes, Washington.

**ACCESS TO MARINE LABS & RESEARCH VESSELS**
Spend time in the field, on oceanographic vessels, and in learning laboratories. Engage deeply in marine research and focused study of the Salish Sea.
### PREPARATORY COURSES

<table>
<thead>
<tr>
<th>COURSE TITLE</th>
<th>CREDITS</th>
<th>PREREQUISITE(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 161 - General Chemistry I</td>
<td>5</td>
<td>MATH 114 or suitable math score</td>
</tr>
<tr>
<td>CHEM 162 - General Chemistry II</td>
<td>5</td>
<td>CHEM 161</td>
</tr>
<tr>
<td>CHEM 163 - General Chemistry III</td>
<td>5</td>
<td>CHEM 162</td>
</tr>
<tr>
<td>MATH 124 - Calculus &amp; Analytic Geometry I</td>
<td>5</td>
<td>MATH 115 or MATH 118 or suitable math score</td>
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<tr>
<td>MATH 125 - Calculus &amp; Analytic Geometry II</td>
<td>5</td>
<td>MATH 124 or MATH 134</td>
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<tr>
<td>GEOL 211 - Physical Geology</td>
<td>5</td>
<td>MATH 114 or suitable math score</td>
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<tr>
<td>BIOL 204 - Intro to Evolution, Ecology, &amp; Biodiversity</td>
<td>5</td>
<td>CHEM 161 or CHEM 175</td>
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<tr>
<td>PHYS 161 - Physics with Calculus I</td>
<td>5</td>
<td>MATH 124 or MATH 134 or MATH 138</td>
</tr>
</tbody>
</table>

### MAJOR COURSES

<table>
<thead>
<tr>
<th>COURSE TITLE</th>
<th>CREDITS</th>
<th>PREREQUISITE(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose from one of the following series;</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>- BIOL 205 - Intro to Cellular and Molecular Biology</td>
<td>5</td>
<td>BIOL 204; CHEM 161 or 175; CHEM 162 or 176</td>
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<tr>
<td>- BIOL 206 - Intro to Organismal Biology</td>
<td>5</td>
<td>BIOL 205; CHEM 162 or 176; CHEM 163 or 225</td>
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<td>OR</td>
<td>5</td>
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<tr>
<td>- PHYS 162 - Physics with Calculus II</td>
<td>5</td>
<td>PHYS 161; MATH 124 or 134 &amp; 125 or 135 or 138</td>
</tr>
<tr>
<td>- PHYS 163 - Physics with Calculus III</td>
<td>5</td>
<td>PHYS 162; MATH 124 &amp; 125 or 134 &amp; 135 or 138</td>
</tr>
<tr>
<td>MACS 210 - Intro to Marine and Coastal Science Research</td>
<td>4</td>
<td>Admissions to MACS major</td>
</tr>
<tr>
<td>Note: BIOL 110 or MACS 110 will satisfy/substitute for MACS 210</td>
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<td></td>
</tr>
<tr>
<td>MACS 301 - Marine Physical Processes</td>
<td>5</td>
<td>MATH 125 or 135 or 138; CHEM 163; PHY 161</td>
</tr>
<tr>
<td>MACS 302 - Marine Geological Processes</td>
<td>5</td>
<td>GEOL 211; MACS 301</td>
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<tr>
<td>MACS 303 - Marine Ecological Processes</td>
<td>5</td>
<td>BIOL 204; MACS 302</td>
</tr>
<tr>
<td>ESCI/BIOL 340 - Biostatistics Analysis/Biometrics</td>
<td>5</td>
<td>BIOL 206 and CHEM 163</td>
</tr>
<tr>
<td>MACS 310 - Marine Science and Society</td>
<td>3</td>
<td>MACS 301</td>
</tr>
<tr>
<td>MACS 493 - Advanced Marine and Coastal Science Research</td>
<td>5</td>
<td>MACS 303</td>
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</tbody>
</table>
DEGREE REQUIREMENTS

MAJOR ELECTIVES

Under advisement, select a minimum of 25 elective credits from BIOL, ESCI, GEOL, and MACS. *Courses listed below are subject to change.

BIOL 437 A&B – Tropical Marine Organismal Biology 12 N/A
BIOL 456 – Algae w/Lab 5 BIOL 206; 5 credits of 300 level science coursework.
BIOL 460 – Invertebrate Zoology 5 BIOL 204, 205, 206
BIOL 464 – Biology of Marine Mammals 4 BIOL 204, 205, 206. Recommended: ESCI 321
BIOL 465 – Vertebrate Zoology 5 BIOL 206; and BIOL 325 or ESCI 325
BIOL 467 – Fundamentals of Biological Oceanography 5 BIOL 325 or MACS 303; BIOL 340 or ESCI 340

ENVIROMENTAL SCIENCE

ESCI 412 – Fisheries Science 5 ESCI 325 or BIOL 325 or MACS 303; ESCI 340 or BIOL 340
ESCI 424 – Marine Fish Ecology 5 ESCI 321 or MACS 301
ESCI 426 – Marine Invertebrates & Their Environment 5 BIOL 206
ESCI 432 – Topics in Marine Ecology 4 ESCI 321 or MACS 301
ESCI 445 – Marine Geochemistry 4 ESCI 321 or MACS 301; CHEM 163
ESCI 491 – Oceanography of the Salish Sea 4 ESCI 321 or MACS 301
ESCI 494 – Marine Conservation 5 Huxley or MACS Major or Senior Status

GEOLOGY

GEOL 212 – Historical Geology 4 GEOL 211 or 211A; MATH 114
GEOL 311 – Earth Materials 5 GEOL 211 or 211A; CHEM 161
GEOL 316 – Paleontology 4 GEOL 212
GEOL 340 – Geological Oceanography 3 GEOL 101 & 211A or 211 or SCED 202
GEOL 352 – Introduction to Geophysics 5 GEOL 211 or 211A; PHYS 163
GEOL 472 – Surface Water Hydrology 4 GEOL 211 or 211A; MATH 124

MARINE AND COASTAL SCIENCE

Exciting new MACS courses will be offered in the future as the program grows and develops. New electives will include areas such as paleoceanography, marine geology, and marine molecular biology.

WESTERN WASHINGTON UNIVERSITY GRADUATION REQUIREMENTS

☐ Satisfy WWU General University Requirements (GURs)
☐ Complete a minimum of 180 quarter credits
☐ Earn a minimum of 45 credits through WWU
☐ Complete 3 upper-division writing proficiency points
☐ Earn a grade of C- or better in major coursework
☐ Meet minimum G.P.A. requirements for WWU (2.0)
☐ Complete 60 credits of upper-division study. Note: The MACS major includes up to 53 upper division credits. An additional 7 credits or more of upper division courses will be required to meet Western Washington University's graduation requirements.
**STEP 1: MEET WITH MACS ADVISOR**
Schedule a meeting with the MACS program advisor to learn more about the major and preparatory courses, as well as the admissions process, including timeline and application requirements.

**STEP 2: DECLARE AS A MACS PRE-MAJOR**
If you decide to pursue Marine and Coastal Science as your major, declare as a pre-major as soon as possible to receive relevant updates, and stay connected with the program and the marine science community.

**STEP 3: COMPLETE PREPARATORY COURSES**
Enroll in, and complete preparatory courses for the major, in Math, Biology, Chemistry, Geology, and Physics.

**STEP 4: APPLY TO THE MAJOR**
Upon nearing completion of your preparatory courses, apply to the major by the program admissions deadline (Dec. 31st).

**STEP 5: START THE MAJOR**
Upon admissions, enroll in MACS 210 (if you didn’t participate in the MSS program) in spring quarter and start the major core series in the fall, starting with MACS 301, followed by MACS 302 and 303 in winter and spring. Flesh out your degree program through a variety of elective courses focused on your goals and interests.
GENERAL ADMISSIONS INFORMATION

Once per year, the program admits a new cohort of approximately 30 students. Students begin the major as a cohort in the spring with MACS 210: Introduction to Marine and Coastal Science Research, and then move to the major core classes starting with MACS 301: Marine Physical Processes in the fall.

The admissions application opens annually in mid – October and closes on December 31st. Students apply on our website by submitting an online application. Typically, students will apply during fall quarter of their sophomore year.

ELIGIBILITY REQUIREMENTS TO APPLY

Students are eligible to apply for admissions to the major when they have completed or will complete by the end of spring quarter all of the major preparatory courses listed below.

» MATH 124 – Calculus and Analytic Geometry I
» MATH 125 – Calculus and Analytic Geometry II
» CHEM 161 – General Chemistry I
» CHEM 162 – General Chemistry II
» CHEM 163 – General Chemistry III
» GEOL 211 – Physical Geology
» BIOL 204 – Introduction to Evolution, Ecology, and Biodiversity
» PHYS 161 – Physics with Calculus I
MAJOR STUDENT ROADMAP

FRESHMAN YEAR
- Complete Prep Courses
- Start Major Intro Research Course
- Continue Prep Courses
- Apply to MACS Major

SOPHOMORE YEAR
- Core Course I
- Core Course II
- Core Course III
- Major Courses & Electives

JUNIOR YEAR
- Finish!
- Capstone Research Course
- Major Courses & Electives
- Major Courses & Electives

SENIOR YEAR

Note: This roadmap reflects a student who decides to pursue the MACS major upon starting at Western.
## CONTACT INFORMATION

**Marine and Coastal Science**

**Address:** 516 High St, MS 9183, Bellingham, WA 98225  
**Email:** macs@wwu.edu  
**Phone:** 360.650.3951  
**Website:** https://marine.wwu.edu

**WWU is an equal opportunity institution.**

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### SAMPLE STUDENT SCHEDULE

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
</tr>
</thead>
</table>
| **MATH 115/118** - Precalculus II  
**GUR** - General University Requirement Course  
**GUR** - General University Requirement Course | **MATH 124** - Calculus & Analytic Geometry I  
**GUR** - General University Requirement Course | **BIOL 205** - Intro to Cellular & Molecular Biology  
**GUR** - General University Requirement Course | **BIOL 206** - Intro to Organismal Biology  
**MACS 301** - Marine Physical Processes  
**GUR** - General University Requirement Course | **MATH 125** - Calculus & Analytic Geometry II  
**CHEM 161** - General Chemistry I  
**GUR** - General University Requirement Course |
| **PHYS 161** - Physics with Calculus I  
**CHEM 162** - General Chemistry II  
**GUR** - General University Requirement Course | **BIOL 204** - Intro to Evolution, Ecol., & Biodiversity  
**CHEM 163** - General Chemistry III  
**GUR** - General University Requirement Course | **MACS 302** - Marine Geological Processes  
**ESC/BIOL 340** - Biostatistics  
**300+ Major Elective**  
**GUR** - General University Requirement Course |
| **MACS 301** - Marine Physical Processes  
**BIOL 206** - Intro to Organismal Biology  
**GUR** - General University Requirement Course | **MACS 302** - Marine Geological Processes  
**300+ Major Elective**  
**GUR** - General University Requirement Course | **MACS 303** - Marine Ecological Processes  
**300+ Major Elective**  
**GUR** - General University Requirement Course | **MACS 310** - Marine Science & Society  
**300+ Elective**  
**Elective** |
| **300+ Major Elective**  
**300+ Elective**  
**Elective** | **300+ Major Elective**  
**300+ Elective**  
**Elective** | **300+ Major Elective**  
**300+ Elective**  

*Sample schedule reflects a student who tests/places into Math 115/118 and completes the biology series. Each student schedule will vary.*