

# MARINE AND COASTAL SCIENCE, BS DEGREE REQUIREMENTS

MAKE WAVES.

## PREPARATORY COURSES

## 40 CREDITS

COURSE TITLE	CREDITS	PREREQUISITE(S)
<input type="checkbox"/> <b>CHEM 161</b> - General Chemistry I *	5	MATH 114 or suitable math score
<input type="checkbox"/> <b>CHEM 162</b> - General Chemistry II*	5	CHEM 161
<input type="checkbox"/> <b>CHEM 163</b> - General Chemistry III*	5	CHEM 162
<input type="checkbox"/> <b>MATH 124</b> - Calculus & Analytic Geometry I**	5	MATH 115 or MATH 118 or suitable math score
<input type="checkbox"/> <b>MATH 125</b> - Calculus & Analytic Geometry II**	5	MATH 124 or MATH 134
<input type="checkbox"/> <b>GEOL 211</b> - Physical Geology***	5	MATH 114 or suitable math score
<input type="checkbox"/> <b>BIOL 204</b> - Intro to Evolution, Ecology, & Biodiversity	5	CHEM 161 or CHEM 175 or concurrent
<input type="checkbox"/> <b>PHYS 161</b> - Physics with Calculus I	5	MATH 124 or MATH 134 or MATH 138 or concurrent

\*CHEM 175 and CHEM 176, General Chemistry I and II Honors are acceptable replacements for the CHEM 161, 162, 163 series

\*\*MATH 134, Calculus 1 Honors and MATH 135, Calculus II Honors or MATH 138, Accelerated Calculus are acceptable replacements

\*\*\* Completion of GEOL 101 and GEOL 211A is an acceptable replacement for GEOL 211

## MAJOR COURSES

## 38 CREDITS

COURSE TITLE	CREDITS	PREREQUISITE(S) and SCHEDULE
<input type="checkbox"/> <b>Choose from one of the following series;</b>		
<input type="radio"/> <b>BIOL 205</b> - Intro to Cellular and Molecular Biology	5	BIOL 204; CHEM 161 or 175; CHEM 162 or 176
<input type="radio"/> <b>BIOL 206</b> - Intro to Organismal Biology	5	BIOL 205; CHEM 162 or 176; CHEM 163 or 225
<b>OR</b>		
<input type="radio"/> <b>PHYS 162</b> - Physics with Calculus II	5	PHYS 161; MATH 124 or 134 & 125 or 135 or 138
<input type="radio"/> <b>PHYS 163</b> - Physics with Calculus III	5	PHYS 162; MATH 124 & 125 or 134 & 135 or 138
<b>MACS 210*</b> - Intro to Marine and Coastal Science Research	3	Admission to MACS major; Offered Spring Term <i>Note: BIOL/MACS 110 will substitute for MACS 210 for MSS or transfer students; MACS 210 includes a one week residential stay at SPMC during spring break</i>
<input type="checkbox"/> <b>MACS 301</b> - Marine Geological Processes	4	MATH 125 or 135 or 138; PHYS 161; GEOL 211 Offered fall quarter
<input type="checkbox"/> <b>MACS 302</b> - Marine Chemical Processes	4	CHEM 163; MACS 301; Offered winter quarter
<input type="checkbox"/> <b>MACS 303</b> - Marine Ecological Processes	4	BIOL 204; MACS 302; Offered spring quarter
<input type="checkbox"/> <b>MACS 304</b> - Marine Physical Processes	4	MACS 301 or concurrent; MATH 125 or MATH 135 or MATH 138; PHYS 161; Offered fall quarter
<input type="checkbox"/> <b>MACS 310</b> - Marine Science and Society	3	MACS 301; Offered winter quarter
<input type="checkbox"/> <b>MACS 399*</b> - Marine and Coastal Science Speaker Series	1	MACS major; Offered spring quarter
<input type="checkbox"/> <b>ESCI/BIOL 340</b> - Biostatistics Analysis / Biostatistics	5	CHEM 163; BIOL 206 or PHYS 163 / BIOL 206

\* Note: Must be taken the spring quarter that student is accepted into the MACS program



The Capstone is expected to be completed during the final year, after completing the core course series. Students should enroll in MACS 496 in the spring of their last year after having completed their research or work experience. The MACS Canvas page will have current information about internships and research projects.

COURSE TITLE	CREDITS	PREREQUISITE(S)
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**Must complete a total of 4 credits of one of the following three options:**

**MACS 493** - Advanced Marine and Coastal Science Research 4 MACS 303

*A course based research experience featuring group project with varying marine focus areas.*

**OR**

**MACS 494\*** - Independent Research Project 1-10 Instructor permission

*Work with a Western faculty member on an independent research project.*

**OR**

**MACS 495\*** - Professional Work Experience in Marine Science 1-10 Instructor permission

*An internship sponsored by an external organization with marine related work.*

*\*Note: If students have not taken MACS 303 yet, they should take a quarter of MACS 492 before starting MACS 494 or MACS 495.*

**MACS 496** - Communicating Marine Science 2 MACS 493 or MACS 494 or MACS 495

## MAJOR ELECTIVES

## 24 CREDITS

Under advisement, select a minimum of 24 elective credits from BIOL, CHEM, ESCI, GEOL, and MACS.

\*Courses listed below are subject to change.

### BIOLOGY

### CREDITS PREREQUISITE(S)

<b>BIOL 321</b> - Genetics	4	BIOL 204, 205, 206
<b>BIOL 323</b> - Cell and Molecular Biology	4	CHEM 351 and CHEM 352 (or concurrent) OR CHEM 251
<b>BIOL 324</b> - Methods in Molecular Biology w/Lab	4	BIOL 321 or BIOL 323
<b>BIOL 345</b> - Fundamentals of Microbiology	4	BIOL 205, CHEM 251 or 351
<b>BIOL 403</b> - Physiological Ecology of Animals w/Lab	5	BIOL/ESCI 325 and BIOL 326 or MACS 303; BIOL/ESCI340
<b>BIOL 405</b> - Microbial Ecology	4	BIOL 325 or MACS 303 or instructor permission
<b>BIOL 432</b> - Evolutionary Biology	4	BIOL 321
<b>BIOL 456</b> - Algae w/Lab	5	BIOL 206; 5 credits of 300 level science coursework
<b>BIOL 460</b> - Invertebrate Zoology w/Lab	5	BIOL 204, 205, 206
<b>BIOL 465</b> - Vertebrate Zoology w/Lab	5	BIOL 206; and BIOL 325 or ESCI 325 or MACS 303

### Chemistry

### CREDITS PREREQUISITE(S)

<b>CHEM 251</b> - Elementary Organic Chem w/Lab	5	CHEM 161 or 175
<b>OR</b>		
<b>CHEM 351</b> - Organic Chemistry	4	CHEM 163 or CHEM 225 or concurrent

### ENVIRONMENTAL SCIENCE

### CREDITS PREREQUISITE(S)

<b>ESCI/ENRG 342</b> - Quantitative Methods in Environ. Science	5	MATH 124
<b>ESCI/ENVS 392</b> - Introduction to Climate Change	4	MATH 114 or ENVS 201; ENVS 203 or GEOL 211
<b>ESCI 393</b> - Our Coastal Seas and Climate Change	4	MATH 114; ESCI 321 or ENVS 203 or GEOL 211
<b>ESCI 412</b> - Fisheries Science	5	ESCI 325 or BIOL 325 or MACS 303; ESCI/BIOL 340
<b>ESCI 417</b> - State of the Salish Sea Ecosystem	5	ESCI, ENVS, BIOL, MACS maj or SALI min; jr or sr status
<b>ESCI 424</b> - Marine Fish Ecology	5	ESCI 321 or MACS 302; ESCI 325 or MACS 303; ESCI/BIOL 340



## ENVIRONMENTAL SCIENCE (CONT'D)

## CREDITS PREREQUISITE(S)

<b>ESCI 426</b> – Marine Invertebrates & Their Environment	5	BIOL 206 or instructor permission
<b>ESCI 432</b> – Topics in Marine Ecology	4	ESCI 321 or MACS 303
<b>ESCI 459</b> - Aquatic Toxicology	3	BIOL 206 and CHEM 163 or instructor permission
<b>ESCI 491</b> – Oceanography of the Salish Sea	4	ESCI 321 or MACS 303
<b>ESCI 494</b> - Marine Conservation	5	College of Envir. major or MACS major; senior status

## GEOLOGY

## CREDITS PREREQUISITE(S)

<b>GEOL 212</b> – Historical Geology	4	GEOL 211 or GEOL 211A or SCED 202; and MATH 114
<b>GEOL 213</b> - GIS in Geology	3	GEOL 101 or GEOL 211A or GEOL 211 or SCED 202 or HNRS 212 or ENVS 203 or concurrent
<b>GEOL 310</b> - Geomorphology	5	GEOL 211 or GEOL 211A; GEOL 213; MATH 114 or higher
<b>GEOL 311</b> – Earth Materials	5	GEOL 211 or 211A or SCED 202; CHEM 161 or SCED 204
<b>GEOL 314</b> - Engineering Geology	4	GEOL 211 or GEOL 211A; PHYS 114 or PHYS 161
<b>GEOL 316</b> – Paleontology	4	GEOL 212
<b>GEOL 352</b> – Introduction to Geophysics	5	GEOL 211 or 211A; PHYS 163

## MARINE AND COASTAL SCIENCE

## CREDITS PREREQUISITE(S)

<b>MACS 111</b> – Current Topics in Marine Science I*	1	Admission to the Marine Science Scholars Program.
<b>MACS 112</b> - Current Topics in Marine Science II**	1	Admission to the Marine Science Scholars Program.
<b>MACS 401</b> - Earth and Ocean Data Analysis	4	MATH 125 or MATH 135 or MATH 138; PHYS 161
<b>MACS 410</b> - Topics in Marine and Coastal Science***	1-5	MACS 301 or MACS 304; or instructor permission.
<b>MACS 491</b> - Teaching Practicum**	1-3	Relevant coursework and instructor permission
<b>MACS 492</b> – Marine Research Participation****	1-5	

\* Can be repeated for a total of up to 2 credits

\*\*Can be repeated for a total of up to 3 credits

\*\*\*Can be repeated for a total of up to 9 credits (with different topics)

\*\*\*\*Can be repeated for a total of up to 5 credits

# WESTERN WASHINGTON UNIVERSITY GRADUATION REQUIREMENTS

- Satisfy WWU General University Requirements (GURs).
- Earn a minimum of 45 credits through WWU.
- Earn a grade of C- or better in major coursework.
- Complete a minimum of 180 total credits.
- Complete 3 upper-division writing proficiency points.
- Meet minimum G.P.A. requirements for WWU (2.0).
- Complete 60 credits of upper-division study.

**Note:** The MACS major includes up to 55 upper division credits. An additional 5 credits or more of upper division courses will be required to meet Western Washington University's graduation requirements.

