WESTERN WASHINGTON UNIVERSITY

MAKE WAVES.

MARINE AND COASTAL SCIENCE, BS

DEGREE REQUIREMENTS

PREPARATORY COURSES — 40 CREDITS

COURSE TITLE	CREDITS	PREREQUISITE(S)
☐ **CHEM 161** - General Chemistry I *	5	MATH 114 or suitable math score
☐ **CHEM 162** - General Chemistry II*	5	CHEM 161
☐ **CHEM 163** - General Chemistry III*	5	CHEM 162
☐ **MATH 124** - Calculus & Analytic Geometry I**	5	MATH 115 or MATH 118 or suitable math score
☐ **MATH 125** - Calculus & Analytic Geometry II**	5	MATH 124 or MATH 134
☐ **GEOL 211** - Physical Geology***	5	MATH 114 or suitable math score
☐ **BIOL 204** - Intro to Evolution, Ecology, & Biodiversity	5	CHEM 161 or CHEM 175 or concurrent
☐ **PHYS 161** - 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
☐ **Choose from one of the following series;**		
○ **BIOL 205** - Intro to Cellular and Molecular Biology	5	BIOL 204; CHEM 161 or 175; CHEM 162 or 176
○ **BIOL 206** - Intro to Organismal Biology	5	BIOL 205; CHEM 162 or 176; CHEM 163 or 225
OR		
○ **PHYS 162** - Physics with Calculus II	5	PHYS 161; MATH 124 or 134 & 125 or 135 or 138
○ **PHYS 163** - Physics with Calculus III	5	PHYS 162; MATH 124 & 125 or 134 & 135 or 138
MACS 210* - Intro to Marine and Coastal Science Research	3	Admission to MACS major; Offered Spring Term
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.		
☐ **MACS 301** - Marine Geological Processes	4	MATH 125 or 135 or 138; PHYS 161; GEOL 211 Offered Fall Term
☐ **MACS 302** - Marine Chemical Processes	4	CHEM 163; MACS 301; Offered Winter Term
☐ **MACS 303** - Marine Ecological Processes	4	BIOL 204; MACS 302; Offered Spring Term
☐ **MACS 304** - Marine Physical Processes	4	MACS 301 or concurrent; MATH 125 or MATH 135 or MATH 138; PHYS 161; Offered Fall Term
☐ **MACS 310** - Marine Science and Society	3	MACS 301; Offered Winter Term
☐ **MACS 399*** - Marine and Coastal Science Speaker Series	1	MACS major; Offered Spring Term
☐ **ESCI/BIOL 340** - 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*

CAPSTONE 6 CREDITS

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)
☐ **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 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, MACS 494 or MACS 495

MAJOR ELECTIVES 24 CREDITS

Under advisement, select a minimum of 24 elective credits from BIOL, ESCI, GEOL, CHEM, and MACS.
*Courses listed below are subject to change.

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

Chemistry	CREDITS	PREREQUISITE(S)
CHEM 251 - Elementary Organic Chem w/Lab	5	CHEM 161 or 175
OR		
CHEM 351 - Organic Chemistry	4	CHEM 163 or CHEM 225 or concurrent

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

MAJOR ELECTIVES (CONT'D) 24 CREDITS

ENVIRONMENTAL SCIENCE (CONT'D)	CREDITS	PREREQUISITE(S)
ESCI 426 – Marine Invertebrates & Their Environment	5	BIOL 206 or instructor permission
ESCI 432 – Topics in Marine Ecology	4	ESCI 321 or MACS 303
ESCI 459 - Aquatic Toxicology	3	BIOL 206 and CHEM 163 or instructor permission
ESCI 491 – Oceanography of the Salish Sea	4	ESCI 321 or MACS 303
ESCI 494 - Marine Conservation	5	College of Envir. major or MACS major; senior status

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

MARINE AND COASTAL SCIENCE	CREDITS	PREREQUISITE(S)
MACS 111 – Current Topics in Marine Science I*	1	Admission to the Marine Science Scholars Program.
MACS 112 - Current Topics in Marine Science II**	1	Admission to the Marine Science Scholars Program.
MACS 401 - Earth and Ocean Data Analysis	4	MATH 125 or MATH 135 or MATH 138; PHYS 161
MACS 410 - Topics in Marine and Coastal Science	1-5	MACS 301 or MACS 304; or instructor permission.
MACS 491 - Teaching Practicum**	1-3	Relevant coursework and instructor permission
MACS 492 – 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 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.