BS MARINE SCIENCES
2022-2026

This document displays only your course requirements at the time of publication of the catalog. You must use your Degree Progress Report to track all graduation requirements.

Note: No Major, Support or Concentration courses may be selected as credit/no credit.

MAJOR COURSES		
BIO 150	Diversity and History of Life	4
BIO 161	Intro to Cell & Molecular Biology (B2 & B3) [1]	4
BIO 162	Intro. to Organismal Form and Function	4
BIO 263	Introductory Ecology and Evolution	4
BIO 461 or BIO 462	Senior Project - Research Proposal [2] Senior Project Research Experience	2
CHEM 302	Marine Chemistry	3
MSCI 100	Orientation to Marine Sciences	1
MSCI 300	Marine Ecology	4
MSCI 301	Biological Oceanography	3
MSCI 403	Ocean Sampling Techniques	4
PSC 201	Physical Oceanography	4
Marine Resources Conservation and Policy, select from: [3]		4
BIO 363	Principles of Conservation Biology	
MSCI 428	Marine Conservation and Policy	
MSCI 438	Aquaculture	
MSCI 439	Fisheries Science & Resource Management	
Marine Biodiversity, select from the following: [3]		4
BIO 322	Ichthyology	
BIO 336	Invertebrate Zoology	
MCRO 436	Microbial Ecology	
MSCI 324	Marine Mammals, Birds and Reptiles	
MSCI 437	Marine Botany	
Communicating Science, select from (excess applied to Electives): [3]		1
COMS 390	Environmental Communication	
COMS 395	Science Communication	
ENGR 322 /SCM 302	The Learn By Doing Lab Teaching Practicum	
MSCI 401	Marine Science Outreach	
MSCI 440	Comm. Ocean Sci to Informal Audiences	
Electives: Select add'l courses from Marine Resources Conservation & Policy, Marine Biodiversity, or Communicating Sci (above) or select from list below: [3]		25
Total Major Units		**71**

SUPPORT		
CHEM 127	Gen CHEM for Agriculture & Life Science I (B1) [1]	4
CHEM 128	Gen CHEM for Agriculture & Life Science II	4
CHEM 129	Gen CHEM for Agriculture & Life Science III	4
CHEM 216 or CHEM 312	Organic Chemistry I [7] Organic Chemistry: Fund. & Applications	5
GEOL 102	Introduction to Geology	4
MATH 141 or MATH 161	Calculus I (B4) [1,8] Calculus for the Life Sciences I	4
MATH 142 or MATH 162	Calculus II (GE Electives) [1,8] Calculus for the Life Sciences II	4
PHYS 121 or PHYS 141	College Physics I [9] General Physics I	4
PHYS 122 or PHYS 142	College Physics II [9] General Physics II	4
PHYS 123 or PHYS 143	College Physics III [9] General Physics III	4
STAT 218	Applied Statistics for the Life Sciences	4
STAT 313	Applied Experimental Design and Regression Models (Upper-Division B) [1]	4
Total Support Units		**49**

GENERAL EDUCATION		
Area A	**English Lang, Communication & Critical Thinking**	
A1	Oral Communication	4
A2	Written Communication	4
A3	Critical Thinking	4
Area B	**Scientific Inquiry and Quantitative Reasoning**	
B1	Physical Science (4 units in Support) [1]	0
B2	Life Science (4 units in Major) [1]	0
B3	One lab in either a B1 or B2 course (in Major)	
B4	Math/Quant. Reasoning (4 units in Support) [1]	0
Upper-Division B (4 units in Support) [1]		0
Area C	**Arts and Humanities**	
Select lower-division courses from three different prefixes.		
C1	Arts	4
C2	Humanities	4
Lower-Division C Elective - Select from either C1 or C2		4
Upper-Division C		4
Area D	**Social Sciences**	
Select courses from at least two different prefixes		
D1	American Inst. (Title 5, Section 40404 Req)	4
D2	Lower-Division D	4
Upper-Division D		4
Area E	**Lifelong Learning and Self-Development**	
Lower-Division E		4
Area F	**Ethnic Studies**	
Lower-Division F		4
GE Electives in Areas C and D		
Select lower- or upper-division courses from two different areas.		
GE Electives (4 units B in Support) [1]		0
GE Electives (Area C or D)		4
Total GE Units		**52**
FREE ELECTIVES [7, 10]		**8**
TOTAL DEGREE UNITS		**180**

FOOTNOTES

[1] Required in Major or Support; also satisfies General Education (GE) requirement.

[2] If BIO 461 or BIO 462 is used to meet the senior project requirement, it cannot be double-counted as an Elective.

[3] If a course is taken to meet a Major or Support requirement, it cannot be double-counted as an Elective.

[4] Maximum of 6 units may be applied toward Electives: BIO 200, 300, 330, 400, 450, 485, 495, 400; ENGR 400; MSCI 401; PHYS 400.

[5] No more than 3 units from COMS 390, 395; ENGR 322/SCM 302; MSCI 440.

[6] Maximum of 2 units may be applied toward Electives from ENGR 322/SCM 302.

[7] If CHEM 216 is taken, then **some Free Electives may need to be 300-400 level to ensure completion of the required minimum of 60 units of upper-division**.

[8] Students emphasizing in Chemistry, Physics or Engineering should take MATH 141 and MATH 142 instead of MATH 161 and MATH 162. GE Area B4 will be met with any of the following: MATH 161, 162, 141, 142.

[9] Students emphasizing in Physics should take PHYS 141, 142 and 143 instead of PHYS 121, 122 and 123. GE Area B1 will be met with any of the following: PHYS 141, 142, 121 or 122.

[10] If a General Education (GE) course is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.

Electives (25 units)

Select additional courses from Marine Resources Conservation and Policy, Marine Biodiversity, or Communicating Science (above) or select from the following: [3]

At least 18 units must be upper-division. Select courses carefully to **ensure that you have taken enough 300-400 level courses to meet the required 60 units of upper-division courses for the degree**.

AG/EDES/ENGR/GEOG/ISLA/SCM/UNIV 350	The Global Environ.
ASCI 290	Animal Production and Management Enterprise
ASCI 490	Advanced Animal Production and Management
BIO 200	Special Problems for Undergraduates [4]
BIO 300	Research Experience for Undergraduates [4]
BIO 327	Wildlife Ecology
BIO 330	Extended Field Biology Activity [4]
BIO 351	Principles of Genetics
BIO 361	Principles of Animal Physiology
BIO 400	Special Problems for Advanced Undergraduates [4]
BIO 413	Evolutionary Medicine
BIO 414	Evolution
BIO 415	Biogeography
BIO 434	Environmental Physiology
BIO 442	Behavioral Ecology
BIO 444	Population Ecology
BIO 445	Community Ecology
BIO 446	Ecosystem Ecology
BIO 450	Undergraduate Laboratory Assistantship [4]
BIO 452	Cell Biology
BIO 461	Senior Project - Research Proposal [2]
BIO 462	Senior Project Research Experience [2]
BIO 463	Honors Research
BIO 470	Selected Advanced Topics
BIO 471	Selected Advanced Laboratory
BIO 472	Current Topics in Biological Research
BIO/CHEM 475	Molecular Biology Laboratory
BRAE 333	Aquacultural Engineering
CHEM 201	Undergraduate Research
CHEM 217	Organic Chemistry II
CHEM 218	Organic Chemistry III
CHEM 220	Organic Chemistry Laboratory For Life Sciences II
or CHEM 221	Organic Chemistry Laboratory II
CHEM 223	Organic Chemistry Laboratory for Life Sciences III
or CHEM 324	Organic Chemistry Laboratory III
CHEM 314	Biochemistry: Fundamentals & Applications
CHEM 331	Quantitative Analysis
CHEM 341	Environmental Chemistry: Water Pollution
CHEM 369	Biochemical Principles
CHEM 372	Metabolism
CHEM 400	Special Problems for Advanced Undergraduates [4]
CHEM 401	Advanced Undergraduate Research
COMS 390	Environmental Communication [5]
COMS 395	Science Communication [5]
CPE/CSC 101	Fundamentals of Computer Science
CRP/NR 404	Environmental Law
CSC/CPE 202	Data Structures
CSC/CPE 203	Project-Based Object-Oriented Programming and Design
CSC 231	Programming for Engineering Students
CSC 232	Computer Prog. for Scientists & Engineers
DATA 301	Introduction to Data Science
EE 201	Electric Circuit Theory
EE 321	Electronics
ENGR 322/SCM 302	Learn By Doing Lab Teaching Practicum [5,6]
ENGR 400	Special Problems for Advanced Undergraduates [4]
ENVE 331	Fundamentals of Environmental Engineering
ENVE 400	Special Problems
ENVE 434	Water Chemistry and Water Quality Measurements
GEOL 200	Special Problems for Undergraduates
GEOL 241	Physical Geology Laboratory
GEOL 330	Principles of Stratigraphy
GEOL 400	Special Problems for Advanced Undergraduates
MATH 143	Calculus III
MATH 241	Calculus IV
MATH 244	Linear Analysis I
MCRO 224	General Microbiology I
MCRO 436	Microbial Ecology
MSCI 401	Marine Science Outreach [4]
MSCI 410	Scientific Diving
MSCI 440	Communicating Ocean Sciences to Informal Audiences [5]
NR 218	Introduction to Geographic Information Systems (GIS)
NR/LA 317	The World of Spatial Data and Geographic Info Tech
NR 321	Water Resources Technology and Society
PHYS 200	Special Problems for Undergraduates
PHYS 314	Ocean Dynamics
PHYS 400	Special Problems for Advanced Undergraduates [4]
PHYS 461	Senior Project I
PHYS 462	Senior Project II
STAT 323	Design and Analysis of Experiments I
STAT 324	Applied Regression Analysis
or STAT 334	Applied Linear Models
STAT 330	Statistical Computing with SAS
STAT 331	Statistical Computing with R
STAT 416	Statistical Analysis of Time Series