

BIOLOGY: MARINE BIOLOGY AND LIMINOLOGY AND INTERDISCIPLINARY MARINE AND ESTUARINE SCIENCES SF SCHOLARS ROADMAP

The San Francisco State Scholars program provides undergraduate students with an accelerated pathway to a graduate degree. Students in this program pursue a bachelor's and master's degree simultaneously. This program allows students to earn graduate credit while in their junior and/or senior year, reducing the number of semesters required for completion of a master's degree.

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

Course	Title	Units
First Year		
Fall Semester		
BIOL 230	Introductory Biology I (Major Lower-Division Core)	5
ENG 114	Writing the First Year: Finding Your Voice (A2) ¹	3
MATH 226	Calculus I (Major Lower-Division Core, B4) ²	4
GE Area A ³		3
	Units	15
Spring Semester		
BIOL 240	Introductory Biology II (Major Lower-Division Core) ⁴	5
CHEM 115	General Chemistry I: Essential Concepts of Chemistry (Major Lower-Division Core)	5
GE Area A		3
GE Area E		3
	Units	16
Second Year		
Summer Semester		
SF State Studies or University Elective - Take Two		6
	Units	6
Fall Semester		
CHEM 130	General Organic Chemistry (Major Lower-Division Core) ⁵	3

PHYS 111 & PHYS 112	General Physics I and General Physics I Laboratory (Major Lower-Division Core, B1, B3)	4
GE Area C		3
GE Area D - Take Two		6
	Units	16
Spring Semester		
Select Two (Major Lower-Division Core):		8-9
CHEM 215 & CHEM 216	General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts (Prerequisites for BIOL 580)	
MATH 227	Calculus II	
PHYS 121 & PHYS 122	General Physics II and General Physics II Laboratory	
GE Area C		3
GE Area D		3
	Units	14-15
Third Year		
Summer Semester		
SF State Studies or University Elective - Take Two		6
	Units	6
Fall Semester		
BIOL 355	Genetics (Major Upper-Division Core) ⁶	3
BIOL 458	Biometry (Major Upper-Division Core)	4
GE Area C		3
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)		3
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)		3
	Units	16
Spring Semester		
BIOL 337	Evolution (Major Upper-Division Core)	3
Select One (Major Upper-Division Core):		3
BIOL 525	Plant Physiology	
BIOL 630	Animal Physiology	
Major Upper-Division Electives (14-17 units) - Take Three ⁷		9
	Units	15

Fourth Year

Summer Semester

SF State Studies or University Elective - Take Two	6
Units	6

Fall Semester

BIOL 708	Scientific Methods for Professional Aquatic Scientists (Graduate Core)	3
MSCI 709	Foundations in Global Change in Urbanized Coasts and Estuaries (Graduate Core)	6
Major Upper-Division Electives (14-17 units) - Take One ⁷		3
Major Upper-Division Core (3-5 units) - Take One ⁸		3-5
Units		15-17

Spring Semester

BIOL 716	Skills for Scientific Proposal Writing (Graduate Core)	3
Major Upper-Division Electives (14-17 units) - Take One ⁷		3
Graduate Seminar - Take One ⁹		2-4
Research - Take One ¹⁰		3
Units		11-13

Fifth Year

Fall Semester

BIOL 883	Seminar: Marine Biology (Graduate Core) ¹²	2
MSCI 717	Professional Skills Workshop I: Data Analysis and Visualization (Graduate Core)	2
MSCI 718	Writing and Professional Skills Workshop II (Graduate Core)	2
Graduate Seminar - Take One ⁹		2-4
Research - Take One ¹⁰		2
Units		10-12

Spring Semester

BIOL 883	Seminar: Marine Biology (Graduate Core) ¹²	2
MSCI 718	Writing and Professional Skills Workshop II (Graduate Core)	2
Thesis - Take One ¹³		3-4
Units		7-8
Total Units		153-161

- ¹ ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you choose ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.
- ² Depending on courses completed through Early Start, students in Pathway/Category III or IV may be required to enroll in a support course to complement their Quantitative Reasoning/B4 requirement. There are multiple course options for this pathway. Before enrolling in a B4 course, students should verify their MATH Pathway/Category in their Student Center (<http://cms.sfsu.edu/content/student-center/>). Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website (<http://developmentalstudies.sfsu.edu/>).
- ³ To avoid taking additional units, it is recommended that you meet **SF State Studies** requirements (AERM, GP, ES, SJ) within your GE or major.
- ⁴ GE Areas B2 (Life Science) and B3 (Laboratory Science) are satisfied upon completion of BIOL 240.
- ⁵ GE Area B1 (Physical Science) is satisfied upon completion of CHEM 130.
- ⁶ Upper-Division General Education, Physical, and Life Sciences (UD-B) is satisfied upon completion of BIOL 355.
- ⁷ **Upper-Division Electives (14-17 units)**
 BIOL 502 Biology of the Algae (3 units)
 BIOL 526 Plant Molecular Physiology Laboratory (2 units)
 BIOL 532 Restoration Ecology (3 units)
 BIOL 555 Marine Invertebrate Zoology (4 units)
 BIOL 556 Natural History of Marine Invertebrates (4 units)
 BIOL 570GW Biology of Fishes - GEAR (4 units)*
 BIOL 575 Fisheries Biology (3 units)
 BIOL 584 Marine Microbial Ecology Laboratory (1 units)
 BIOL 586 Marine Ecology Laboratory (2 units)
 BIOL 631GW Animal Physiology Laboratory - GEAR (4 units)*
 CHEM 680 Chemical Oceanography (3 units)
 EARTH 434 Coastal Processes (3 units)
 EARTH 642 Watershed Assessment and Restoration (4 units)
- ⁸ **Major Upper-Division Core Options (3-5 units)**
 BIOL 534 Wetland Ecology (4 units)
 BIOL 580 Limnology (3 units)
 BIOL 582 Biological Oceanography (4 units)
 BIOL 585 Marine Ecology (3 units)
 and BIOL 586 Marine Ecology Laboratory (2 units)
- ⁹ **Graduate Seminar Course Options:**
 BIOL 863 Advances in Marine Biology (2 units)
 EARTH 795 Selected Topics in the Geosciences (3 units)
 GEOG 857 Issues in Marine and Estuarine Conservation (3 units)
 or an Elective on Advisement ¹¹
- ¹⁰ **Research Course Options**
 CHEM 897 Research (1-9 units)
 BIOL 897 Research (1-6 units)
 EARTH 897 Research Project (1-3 units)
 GEOG 896 Directed Reading in Geography (3 units)
 or Equivalent

¹¹ **Electives**

Include but are not limited to:

- BIOL 534 Wetland Ecology (4 units)
- BIOL 582 Biological Oceanography (4 units)
- BIOL 585 Marine Ecology (3 units)
- BIOL 702 Biology of the Algae (3 units)
- BIOL 863 Advances in Marine Biology (2 units)
- CHEM 680 Chemical Oceanography (3 units)
- ERTH 795 Selected Topics in the Geosciences (3 units)
- ERTH 834 Coastal Processes (3 units)
- ERTH 870 Physical Oceanography (4 units)
- GEOG 629 Coastal and Marine Applications of GIS (3 units)
- GEOG 857 Issues in Marine and Estuarine Conservation (3 units)
- Electives taught at SF State, MLML, or elsewhere (e.g. UC Berkeley) on advisement. e.g., Biometry, Animal Physiology, Conservation Biology, etc

¹² **Seminar: Marine Biology (BIOL 883)**

MS in IMES students are expected to participate each semester in this research colloquium that is the Wednesday RTC lecture series. Students are expected to enroll in BIOL 883 each semester, though the course can only count twice (4 units total) towards the degree. This course does not fulfill the graduate seminar requirement.

¹³ **Thesis - Select One:**

- BIOL 898 Master's Thesis (4 units)
- ERTH 898 Master's Thesis (3 units)
- GEOG 857 Issues in Marine and Estuarine Conservation (3 units)
- or Equivalent on Advisement

* Students are required to complete at least one GVAR course in order to graduate.