

Biology

Chemistry	(10)
CHEM 1A, 1B	
Geology ¹	(8)
GEOL 1 and 3 (or 15),	
GEOL 168	
Natural Science	(3)
N SCI 106	
Physical Science	(4)
P SCI 21	
Biology Option	42-44
CHEM 8 or 128A	(3)
PHYS 2A, 2B ²	(8)
P SCI 168	(3)
MATH 70 or 75	(4)
MATH 101 or PSYCH 42	(4)
BIOSC 140A, 140B, 180	(10)
MICRO 140	(4)
Select one course: BOT 131, 132, 144; MICRO 171; ECOL 151, 152, 162; ZOOL 120, 141, 148, 150, 174, 177 ...	(3-4)
Select one course: BOT 130; MICRO 161; PHYAN 151, 163	(3-4)
General Education	51
Electives and remaining degree requirements^{3,4}	0-6
Total	124

Advising Notes for the Natural Sciences Major

1. BIOL 15 and GEOL 15 are part of the Humans and the Natural Environment Cluster. See the *Natural Science Interdisciplinary Courses* section in this catalog. GEOL 15 is equivalent to GEOL 1 and 3.
2. Substitutions may be made with the permission of the appropriate department chair. PHYS 4A-B-C with labs 4AL, 4BL is recommended instead of PHYS 2A-B for those students well-prepared for physics.
3. This total assumes that students in this option will maximize the 9-12 units required for the major that also may be applied to fulfill General Education requirements as follows: CHEM 1A (3 units), BIOSC 1A or BIOL 15 (3 units), GEOL 168 (3 units), and 3 units if MATH 75 is selected. Consult your major adviser for details.

4. Students should be sure to take sufficient upper-division units in their General Education courses and electives to satisfy the graduation requirements of 40 upper-division units and Upper-division Writing Skills.

Graduate Programs

The Biology Department offers the Master of Science degree in Biology with the opportunity for specialization in several areas of study. Among these areas are ecologically oriented field studies; molecular and cellular biology; physiology at both invertebrate and vertebrate levels; entomology; microbiology; parasitology; botany; systematics; animal behavior. The program also prepares candidates for teaching various biological science disciplines at the primary and secondary education levels. A further objective of the master's program is to provide a foundation for those seeking advanced education at universities offering the doctorate or other professional degrees. The Biology Department has further informational materials available upon request.

The Biology Department and the university are located in a region uniquely suited to the pursuit of projects that are environmentally oriented. High Sierra, foothill, coastal, and forest environments are all within three hours drive of California State University, Fresno. Facilities are available at the campus for studies involving genetic recombination, electron microscopy, use of radioactive materials, and metabolic studies on all living forms. Cooperation with local physicians and hospitals provides additional opportunities to pursue medically oriented research.

The Biology Department is a member of a consortium that manages and operates the Moss Landing Marine Laboratory (MLML). MLML is located on the California coastline between Santa Cruz and Monterey. A master's candidate interested in pursuing marine science studies must meet California State University, Fresno Biology Department master's candidate requirements as well as those of MLML. Such candidates are encouraged to consult the Biology Department's MLML coordinator for information and to read the MLML information presented at the end of this section.

Master of Science Degree Requirements

The Master of Science degree program in Biology assumes preparation equivalent to a California State University, Fresno undergraduate major in biology. Students having undergraduate majors in fields other than the biological sciences may enter the program, but may reasonably expect additional requirements to produce equivalent preparation.

There are five steps that must be completed for the Master of Science degree in Biology:

1. Admission to the university as a post-baccalaureate student
2. Admission to classified graduate standing (constitutes admission to the department program)
3. Advancement to candidacy (formalizes thesis committee and research project)
4. Completion of a thesis and associated requirements
5. Completion of all additional requirements for award of master's degree

Normal progress toward the Master of Science degree in Biology requires that classified graduate standing be achieved in the first semester of graduate study and that advancement to candidacy be granted the following semester. Completion of the thesis and all other program requirements will normally require two additional semesters of study. Procedures for completing these steps are outlined in the following sections. Students should meet with the departmental graduate coordinator at the earliest possible date. Students are personally responsible for ensuring that all graduate degree requirements have been met in sequence; therefore, each student should read the procedures thoroughly to be sure all requirements are understood.

Admission to Graduate Standing

Admission to the university is handled through the Admissions Office of California State University, Fresno. For admission to postbaccalaureate/graduate standing, a student must have completed a four-year college program and hold an acceptable baccalaureate degree from an accredited institution with a grade point average of 2.5 in the last 60 units.

To be considered for classified standing in biology, the following additional steps are required of students planning to enter the biology graduate program.