

Biology, M.S.

DEPARTMENT

MN in Biology, Minor
MS in Biology, M.S.
MBT in Biotechnology, M.Bt.
BS in Biology, B.S.
CERT in Biotechnology, Certificate of Adv. Study
CRED in Professional Clear Foundation Level General Science
CRED in Single Subject Credential - Biological Science

REQUIREMENTS

Department

Master of Science Degree Requirements

Graduate Program

The Biology Department offers a research-intensive Master of Science in Biology with the opportunity for specialization in several areas of study. Among these areas are ecologically oriented field studies in fresh water, terrestrial, and marine environments; molecular, cellular, and developmental biology of plants, animals, and microbes; physiology of microbes, plants, and animals; entomology; microbiology; parasitology; botany; zoology; systematics; and animal behavior. The program also prepares candidates for teaching biological science disciplines at the secondary and community college education levels. The master's program provides a strong foundation for those seeking advanced education at universities offering the research doctorate (Ph.D.) or other professional degrees. The Biology Department has further informational materials available on request.

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.

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 the graduate information.

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

1. Admission to the university as a postbaccalaureate 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 Graduate Admissions Office of California State University, Fresno. For admission as a postbaccalaureate student to the university, a student must have completed a four-year college program and

hold an acceptable baccalaureate degree from an accredited institution with a minimum grade point average of 2.5 in the last 60 units.

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

1. Submit current scores (within the last five years) for the General Graduate Record Exam.
2. Contact the graduate coordinator in the Biology Department prior to registration for assignment of a temporary faculty adviser who will assist in the planning of initial courses. Students may request the assignment of any biology faculty member to serve in this capacity.
3. Meet with the temporary adviser prior to registration and develop an approved initial program of at least 9 units that is mutually agreeable to the student and the adviser. These courses are to be entered on the "Approved Preliminary Program" form (available from the Biology Office) and signed by the student, temporary adviser, and departmental graduate coordinator. This will constitute the Approved Initial Graduate Program. These courses may or may not be included on your Advancement to Candidacy Application; make-up classes, for example, are not included. All students are required to have the "Approved Preliminary Program" form approved and on file prior to registration. Upon completion of all prerequisites, the student must file for classified standing.

Admission to Classified Graduate Standing

Admission to classified graduate standing constitutes official admission into the graduate program in the Department of Biology and requires the approval of the Biology Department. Classified standing must be attained no later than the semester in which a student completes 10 units, including transfer and postbaccalaureate credit, to be used toward the master's degree; students should attempt to obtain classified graduate standing as early as possible in their graduate careers to avoid possible loss of units. Normal progress toward the degree requires that this be accomplished in the first semester of graduate work.

Students applying for classified standing should be sure they have submitted an "Approved Preliminary Program" form to the departmental graduate coordinator.

Admission to classified graduate standing must be recommended by the graduate coordinator in consultation with the Graduate Committee of the Biology Department. To be recommended, the student must demonstrate competency in verbal or written communication, quantitative analytical skills and disciplinary knowledge.

Competencies may be demonstrated in the following manner:

1. For verbal or written communication, students must achieve one of the following: (1) 60th percentile or better on the verbal portion of the general GRE, (2) a grade of B or better in an upper-division writing course, (3) a score of 4.5 or better on the writing portion of the General GRE, or (4) 80% or better on the Upper-Division Writing Exam. In exceptional cases the Graduate Committee may consider alternative evidence of verbal or writing skills.
2. For quantitative analytical skills, students must achieve either (1) a quantitative GRE score of 60th percentile or better or (2) a B or better in a mathematics class at least at the level of MATH 70 (introductory calculus).
3. For disciplinary knowledge, students must achieve at least one of the following: (a) A score on the subject Biology test of the GRE of 60th percentile or better. (b) No less than a grade of B in the following upper-division core courses or their equivalents: genetics, evolution, either cell biology or ecology, and one other upper-division or graduate course appropriate to the student's specialty. Evaluation of coursework will be conducted by the graduate coordinator in consultation with faculty teaching the core courses at California State University, Fresno. (c) No less than a grade of C in each of the courses listed in (b) above, as well as an overall GPA of 3.0 or better for at least 25 semester units of upper-division lecture or lecture/laboratory courses in natural science.

On recommendation, students will be assigned to one of the following two categories:

1. **Classified graduate standing** will be assigned to students meeting the standards in verbal written communication, quantitative analytical skills, and disciplinary knowledge.
2. **Conditional classified standing** will be assigned to students meeting a majority of the classification standards yet having specific identifiable deficiencies that may be easily corrected within two semesters. While this classification gives students the opportunity to remedy identified deficiencies, those remedial courses taken to correct deficiencies may not be applied to the graduate program.

Students recommended for classified graduate standing may proceed with the completion of requirements for advancement to candidacy, the next step in the graduate program. Students granted conditional classified status will not have been admitted to

the graduate program in biology and must remedy their deficiencies in order to be recommended for classified standing. The graduate coordinator will provide further information on how this may be accomplished.

When any requirements for a change in graduate standing have been completed, the student must see the graduate coordinator and file appropriate forms with the graduate division.

Advancement to Candidacy

Acceptance to **classified graduate standing** indicates that the student's academic background and perceived ability are sufficiently high to merit admission into the biology graduate program. **Advancement to candidacy** signifies that the student has developed a coherent program of study for the Master of Science degree that meets with the approval of the Biology Department. Advancement to candidacy requires passing the Graduate Student Writing Requirement, the establishment of the Thesis Committee, identification of the thesis topic, and the approval of all coursework that must fit within the following framework:

Courses in 200-series (**17 units**)

Electives (May be 100- or 200-series) (**9 units**)

Thesis (BIOL 299) (**4 units**)

Total (30 units)

No less than 18 units of the approved coursework must be in the biological sciences. Nine units must be completed prior to advancement to candidacy. The Biology Department also requires that at least 10 units of approved coursework be completed after advancement to candidacy.

Units completed during the semester that advancement is achieved will be considered to have been completed after advancement to candidacy. Before students may advance to candidacy, they must satisfactorily complete the Biology Department Graduate Student Writing Requirement. Students must submit a formal paper demonstrating writing skill at the graduate level. This graduate-level paper may be a research proposal, a literature review in their field, a paper from a graduate directed research project, or another paper. Detailed writing requirement regulations are available from the departmental graduate coordinator. Normal degree progress requires that advancement to candidacy be achieved in the semester following admission to classified standing. A student must be advanced to candidacy, possess a GPA of 3.0 or better, and file a Thesis Committee Assignment Form before enrolling in thesis (BIOL 299).

A complete list of the steps required for advancement to candidacy is available from the departmental graduate coordinator or at www.fresnostate.edu/biology/Graduate/default.htm.

Completion of a Thesis

The Master of Science in Biology requires completion of a research thesis (BIOL 299). The thesis must show originality, appropriate organization, clarity of purpose, critical analysis, and accuracy and completeness of documentation where needed. Critical and independent thinking are required. The finished thesis must meet standards appropriate for publication in the scholarly journals of the field. A colloquium is required of all students at least seven days prior to the last day of instruction of the spring or fall semester, or by June 30 of the summer session. Additional information and regulations on the colloquium and on thesis completion are available from the department's graduate coordinator.

Completion of All Requirements for Award of Master of Science Degree in Biology

In addition to the above requirements, in order to receive the Master of Science in Biology the student must:

1. Maintain a GPA of 3.0 or better in all graduate coursework undertaken from the date of embarking on the first course of the approved program. Students wishing to explore other academic areas without jeopardizing this grade point average should attempt to use the CR/NC grade option for this purpose.
2. File an application for the granting of the Master of Science degree and pay the diploma fee. Applications should be submitted during the first two weeks of the semester (or the first week of a summer session) in which the degree is to be completed and are available from the Division of Graduate Studies, Haak Center, Library 4140, West Wing.

FACULTY

Faculty expertise spans the range of biology from the molecular to the ecological, with a broad representation of taxonomic specialties. Laboratories in most upper-division majors' courses are taught by faculty, and individualized student/faculty research participation through independent study is strongly encouraged.

Faculty members have garnered independent research funding from various agencies including the National Institutes of Health, National Science Foundation, U.S. Department of Agriculture, Environmental Protection Agency, and National Sea Grant. Faculty and students also participate in collaborative studies on, for example, medical and clinical topics with local physicians and hospitals; agricultural topics with the University of California Kearney Agricultural Research and Extension Center, Agricultural Research Service San Joaquin Valley Agricultural Sciences Center in Fresno/Parlier; ecological and environmental topics with California Department of Fish and Wildlife, U.S. Forest Service and Endangered Species Recovery Program; and science educational topics with regional school districts and state and national credentialing agencies.

For faculty phone numbers and e-mail, see the campus directory.

For more on the faculty, see the faculty pages.

The faculty pages are updated by the department or program.