

BIOLOGY

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Program Description

The Department of Biology offers a graduate program leading to a Master of Science in Biology degree. The Master of Science with a thesis option is intended to prepare students for professional positions in state and federal agencies, the environmental consulting industry, and for advanced graduate studies. The Master of Science with a non-thesis option is intended for working professionals, especially public school teachers, and emphasizes course work. A broad range of faculty research interests, easy access to diverse biological environments, and a range modern research facilities permit the student to select from a broad spectrum of research topics.

Research facilities include a 16.3 ha Environmental Studies Area (on campus), the Facility for Animal Care and Treatment where raptors are treated and rehabilitated (located within the ESA), and two greenhouses. In addition, the department has two growth chambers, an ultracentrifuge, gel-dryer, -70° C freezer, thermocycler, 2D protein analyzer, refrigerators, and a scanning electron microscope. Faculty interests include field biology, physiology, comparative morphology, ichthyoarchaeology, microbiology, molecular evolution, ecology, systematics, and behavior.

APPLICATION PROCESS AND PROGRAM REQUIREMENTS

Application for the Master of Science in Biology

Persons seeking an MS in Biology must first apply to the Office of Admissions and Records for admission as unclassified graduate students. After admission to the University in the unclassified category, students are eligible to take graduate courses in Biology, but without the assurance that their course work will count as credit towards the MS degree at CSUB. After admission to the University in the unclassified category, students should apply to the Graduate Committee of the Department to be advanced to conditionally classified or classified status.

After admission by the Graduate Committee of the Department, the Graduate Coordinator serves as adviser. Once the student embarks on the MS Thesis research the faculty member directing the research project will serve as advisor.

Once a student has started on a MS Thesis research project or Non-Thesis project, the research adviser will assemble a thesis committee.

Academic advising is available through the Graduate Coordinator and the research adviser of the student.

Admissions requirements for the Master of Science in Biology

1. An earned bachelor's degree in the biological sciences or a bachelor's degree in a related science with minimum course work equivalent to Biology 304, 305, 306, and 310.

2. An undergraduate GPA of at least 3.0 in the last 90 quarter (60 semester) units of course work, or Graduate Records Examination scores of 1000 or greater (verbal and quantitative), or an approved petition to the Graduate Committee of the Department waiving this requirement by proposing other evidence of adequate prior academic preparation.
3. Formal decision by the Departmental Graduate Committee to accept the student into the graduate program. The decision will be based on a formal application procedure, which includes evaluation of GPA, *GRE* scores, letters of recommendation, an interview, and other materials that may be required by the Committee and/or offered by the student.

Graduate Student Classifications

Unclassified Post Baccalaureate Status - The Unclassified Post Baccalaureate status allows students to take graduate level courses on a course-by-course basis without being formally accepted into the MS program. Requirements for Post Baccalaureate status are listed below.

1. An acceptable baccalaureate degree from an accredited institution.
2. An undergraduate GPA of at least 2.5 in the last 90 quarter (60 semester) units of course work or an approved petition to the Graduate Committee of the Department waiving this requirement by proposing other evidence of adequate prior academic preparation.

Classified Graduate Student - Acceptance as a Classified Graduate Student indicates that space has been made available for the student within the program and that the student has met the minimum preparation requirements to commence the program as listed below.

1. An acceptable baccalaureate degree from an accredited institution.
2. An undergraduate GPA of at least 3.0 in the last 90 quarter (60 semester) units of course work, or Graduate Records Examination scores of 1000 or greater (verbal and quantitative), or an approved petition to the Departmental Graduate Committee waiving this requirement by proposing other evidence of adequate prior academic preparation.
3. Acceptance into an academic advising relationship with a departmental faculty member.
4. Acceptance will only be granted if space is available for the student in the program.

Conditionally Classified Graduate Student - Students who fail to meet entirely one or more of the criteria for admission as a Classified Graduate Student may, at the discretion of the Biology Graduate Admissions Committee, be admitted as a Conditionally Classified Graduate Student. These conditions may include, but are not limited to, specific prerequisite courses, GPA, *GRE* scores, etc. Once the student has "remedied" all conditions specified by the Biology Graduate Admissions Committee, the student classification will be changed to Classified Graduate Student.

Students admitted as a Conditionally Classified Graduate Student are not allowed to enroll in any 600-level courses. They are restricted to 500- and 400-level courses for which they have met prerequisites.

Advancement to Candidate Status - Acceptance as a candidate indicates that the student has completed at least 30 quarter units within the approved Plan of Study and that there is a reasonable expectation that the student will complete all remaining requirements within one year. Classified Graduate Students will be advanced to Candidate Status when they have met the following criteria:

1. Completion of all requirements for Classified Status.
2. Completion of at least 30 quarter units of courses applicable to the Master of Science Degree in Biology with a grade of "B-" or better and graduate GPA of at least 3.0.

3. Approval of the student's Master's thesis research topic by the Departmental Graduate Program Coordinator, Thesis Committee and Departmental Graduate Committee.
4. Certification by the student's thesis advisor that there is a reasonable expectation that the student will satisfactorily complete the Master's thesis within one year.

Time limits have been set for completion of requirements at each level of status. Admission to Classified Status must be accomplished within two calendar years after acceptance as a Conditionally Classified Graduate Student. No more than three courses (15 units) may be taken for graduate credit until all prerequisites have been satisfied. Admission to Candidate Status must be attained within two calendar years after acceptance as a Classified Graduate Student. All requirements and graduation are to be completed within five calendar years after acceptance as a Conditionally Classified Graduate Student. The five-year time limit can be extended by petition to and approval from the Departmental Graduate Committee.

Completion of all requirements for the Master of Science in Biology require satisfactory completion of all courses in an approved Plan of Study and satisfactory completion of a project or thesis, including oral examination and any revisions required by the Thesis Committee or Departmental Graduate Committee, and maintaining a 3.0 GPA.

Course Requirements for the Master of Science in Biology

A minimum of 45 units of course work is required for the MS in Biology. The following courses are required of all students:

BIOL 505 Current Topics in Biology (9 units)
BIOL 510 Advanced Writing and Experimental Design
BIOL 605 Seminar in Biology

For students choosing the MS Thesis option, the following courses are required:

MATH 521 Statistics and Data Analysis
BIOL 690 Thesis

For students choosing the MS Non-Thesis option, the following courses are required:

BIOL 540 Graduate Practicum in the Teaching of Biology
BIOL 680 Non-Thesis Project

An approved* course of study consists of an addition of a minimum of 15 units for the thesis option or 20 units for the non-thesis option (all courses are 5 units credit except BIOL 580):

BIOL 404 Conservation Biology
BIOL 406 Advanced Ecology
BIOL 424 Evolutionary Genetics
BIOL 430 Molecular Biology
BIOL 433 Developmental Biology
BIOL 451 Functional Analysis of Vertebrate Structure
BIOL 455 Physiological Measurements
BIOL 462 Plant Physiology
BIOL 470 Evolution
BIOL 577 Advanced Topics in Biology
BIOL 580 Research (variable units)

*Approval by Graduate Coordinator, Thesis Advisor and Committee

COURSE DESCRIPTIONS

BIOL 505 Current Topics in Biology (3)

Current topics of special interest to graduate students in Biology. Topics and content will vary as announced but will include contemporary or interdisciplinary areas of interest. Repeatable. Prerequisites: Graduate standing or consent of instructor and an upper division course appropriate to the topic.

BIOL 510 Advanced Experimental Design and Analysis (4)

Course covers how to effectively communicate biological science to the scientific community, effective methodology in experimental design, and proposal writing, including writing specific aims and creating a budget. Three hours lecture and three hours laboratory. Prerequisites: Graduate standing or consent of instructor.

BIOL 540 Graduate Practicum in the Teaching of Biology (3)

Theory and practice in teaching biology at the undergraduate level. Regular meetings with the faculty sponsor and supervised experience in course design, lecturing, tutoring, laboratory preparation and delivery, administering and scoring examinations, and leading classroom discussions. One hour lecture and six hours laboratory. Prerequisites: Graduate standing

BIOL 577 Advanced Topics in Biology (5)

Laboratory or field-based graduate level biological topics in a specialized area of contemporary biology, such as genetics, ecology, microbiology, physiology, behavioral biology, systematics, or molecular biology. Topics will be announced. May be repeated for credit as topics change. Two hours lecture and nine hours laboratory. Prerequisites: Graduate standing or consent of instructor and an upper division course appropriate to the topic.

BIOL 580 Research (1-5)

Independent research: the student formulates a problem and research design in consultation with the faculty, conducts the investigation, compiles and analyzes the data, and presents the findings in written form. Although repeatable, a maximum of five units may be applied towards the Master's degree. Available by consent of the advisor.

BIOL 605 Seminar in Biology (3)

Student presentation and discussion of reviews and reports focusing on current literature and scientific research in the areas of Biology. Prerequisites: Biology 505, 577, and approved petition for advancement to candidacy.

BIOL 680 Non-Thesis Project (3)

Students complete a project that requires the appropriateness of topic, theory, and methods applicable to the nature of the degree, conducted under the supervision of the Departmental Graduate Committee. Prerequisites: Approved petition for advancement to candidacy.

BIOL 690 Thesis (3)

Laboratory, field investigation, or a combination of both investigating a research problem. Preparation, completion, and oral defense of a written thesis approved by the Thesis Committee and the Departmental Graduate Committee. May be repeated twice for credit. Students may apply a total of 9 units towards degree. Prerequisites: Approved petition for advancement to candidacy.

MATH 521 Statistics and Data Analysis (5)

See Mathematics for course description.