

Master of Science in Biology

Administrative Unit

This program is administered by the Office of Graduate Studies and Research through the faculty of Biology, Department of Biology, College of Arts and Sciences.

Objectives

The Master of Science program in Biology includes advanced education in experimental molecular, cellular and organismal biology. The program is designed primarily to prepare students for a professional career in an advanced field of biology. The program is used by students who want to gain additional background for teaching, as well by those who are preparing to go on to Ph.D. programs or professional schools.

Admission Requirements

Acceptance to the Master of Science program requires 16 credits of biology, eight credits of chemistry and three credits of mathematics at the undergraduate level. Depending upon the student's undergraduate program and career goals, the advisory committee may require completion of additional courses at the undergraduate level. (see Program Recommendations below) In addition to a completed application for Graduate Studies, prospective students must also submit two letters of recommendation, at least one of which must be from an undergraduate faculty member in the sciences who can address the suitability of the applicant for advanced study. Applicants must also submit a letter that addresses the reasons why they wish to pursue an advanced degree in biology and the area of biology they wish to study.

Core Requirements

A minimum of 30 graduate credits must be earned to qualify for the Master of Science degree. Of these, a minimum of 15-18 must be in Biology while 6-9 hours may be in supporting areas of study. The remaining 6 credits must be earned in independent study leading to an original thesis. This study is normally directed by the chair of the advisory committee. During the final semester of study, the student must defend the thesis before the advisory committee and other appropriate faculty. The first part of this defense, which consists of an oral presentation of the thesis work, is open to the public.

Special Program Features

Where appropriate, individualized instruction is used in each student's program so not all courses require regular attendance. Laboratory facilities are ideally suited for individualized instruction. Students will also be given an opportunity to gain experience in teaching by assisting in one or more undergraduate laboratory courses under the supervision of a faculty member.

Program Recommendation

If they have not already done so, students must complete organic chemistry I and II, calculus I and II, and physics before admission to regular graduate status. Students lacking specific upper level biology background such as biochemistry, genetics, animal physiology, or evolution may be approved by the advisory committee to take these undergraduate courses for 4000-level graduate credit (see list below).

Course Listings

BIOL 6300 Bacteriology (3)

Study of bacteria, with special emphasis on the genetics of pathogenic bacteria and how they cause disease. Readings from the current literature in the field will be analyzed and discussed. Prerequisites: BIOL 4340, BIOL 3300, or BIOL 6340. S, alternate years.

BIOL 6301 Studies In Virology (3)

Analysis and interpretation of modern studies of viral structure, replication and pathogenesis. Prerequisites: BIOL 4320, 4340 or equivalent. Offered alternate years.

BIOL 6323 Immunology (3)

Analysis and interpretations of studies of mammalian mechanisms of defense against infectious diseases and cancer. Prerequisites: BIOL 3300, 4320, 4340, or equivalent. Offered alternate years.

BIOL 6330 Plant Physiology and Biochemistry (3)*

Techniques, principles and analysis of problems in plant, biochemistry, and physiology. Prerequisite: BIOL 4320 or equivalent.

BIOL 6332 Plant Taxonomy (3)

Advanced studies and collection of a specific taxonomic group to be determined in consultation with the student. Prerequisite: BIOL 3330 and 3331 or equivalent.

BIOL 6340 Molecular Genetics (3)

Studies of gene transfer, mapping, expression and control mechanisms. Prerequisite: BIOL 3300, 3101, and 4320 or equivalent.

BIOL 6350 Advances in Animal Physiology (3)

Analysis and interpretation of studies in the laboratory and literature. Prerequisites: BIOL 4320 and 4352 or equivalent.

BIOL 6356 Neuroscience (3)

An analysis of the physiological bases of behavior, beginning with a study of the functioning of excitable cells and ending with a study of the neuroanatomy of the brain. Prerequisites: BIOL 4352 or permission of the instructor.

BIOL 6371 Advances in Ecology (3)

An in-depth investigation of current topics in ecology. Prerequisite are graduate standing and successful completion of an undergraduate course in ecology.

BIOL 6373 Advanced Field Biology (3)

Advanced work in field biology and data analysis. Course will be conducted on campus and at an outdoor field site. Prerequisites: a graduate course in ecology. Repeatable for credit if taxonomic emphasis changes. Maymester.

BIOL 6375 Advances in Animal Behavior (3)

An in-depth investigation of current topics in animal behavior. Prerequisites are graduate standing and successful completion of an undergraduate course in animal behavior.

BIOL 6389 Selected Topics (1-3)

Graduate courses which will be offered only once, will be offered infrequently, or are being developed before a regular listing in the catalog.

BIOL 6391 Contract Study (1-3)

For students who are pursuing independent study or research (as described in the contract study format).

BIOL 6392 Research in Biology (3)

Directed research on a topic in biology. May be repeated but not for additional credit.

BIOL 6399 Masters Thesis (3 or 6)

Meets the research requirements for the thesis option in Master's Degree programs.

Undergraduate Courses that could be Included in a Graduate Degree Plan*

BIOL 4141 Laboratory in Genetics	BIOL 4340 Genetics
BIOL 4153 Animal Physiology Lab	BIOL 4342 Evolution
BIOL 4272 Field Biology	BIOL 4352 Animal Physiology
BIOL 4301 Virology	BIOL 4354 Animal Behavior
BIOL 4303 Principles of Nutrition	BIOL 4362 Histology
BIOL 4320 Cell Biochemistry	BIOL 4372 Ecology
BIOL 4323 Immunology	BIOL 4389 Multi Course Listing

* With Committee Permission. See course descriptions in the Undergraduate Catalog.