BIOLOGY (MS)

Exploration and Discovery

The Master of Science (MS) in Biology program provides students with the knowledge and research skills that are necessary for students to attain their professional goals in several exciting core areas of the biological sciences. The program consists of two primary focal areas, coursework, and original research. Coursework prepares students to become professional biologists by introducing them to the wide variety of skills needed to address current and future biological problems. The research emphasis of this program will help students further enhance their skills and contribute to the body of knowledge in the field of biology while preparing for PhD programs or professional employment.

Program Objectives

Students in PSU's MS in Biology program will develop research skills by investigating unanswered questions in the field of biology, becoming familiar with the latest biological methodology relating to their topic of choice, understanding the capabilities and limitations of these various methods, and learning to communicate biological concepts effectively both verbally and in writing. Professors in the department have exciting and vibrant research programs in fields of study including animal or plant physiology, animal behavior, neurobiology, molecular and cell biology, bioinformatics, genetics, microbiology, development, and ecology.

Outcomes

Upon completion of the program, students will have the skills necessary to read and write scientific literature, ask and answer life sciences questions, and direct independent research projects. In addition, students will be prepared to progress into PhD programs or professional employment in their field of study.

Admission Requirements

Candidates will be selected for admission by the biological sciences faculty. Admission is competitive and is dependent upon a faculty member agreeing to serve as a research advisor for a student; therefore, students should contact potential advisors about availability and mutual interest before applying to the program. Applicants must possess a 3.0 cumulative grade point average on a 4.0 scale from their undergraduate coursework to be considered for full matriculation in the program, with particular emphasis on success in the areas of science and math. Successful applicants will also need sufficient background in key areas such as mathematics, physics, chemistry, and biology. International students from a country where English is not the primary language must provide proof of English proficiency as outlined in the Admissions section of the catalog. All other admissions policies, fees, and conditions apply.

Exceptions to the Admissions standards described above may be possible with other compelling evidence of sufficient qualifications. Students without the necessary prerequisites may gain conditional admission, pending completion of necessary requirements and/or success in the program. Students admitted conditionally will meet with a program advisor to develop a plan to complete prerequisites for the program. Any remedial undergraduate credits will not count toward the 30 graduate credits required for completion of the program. Admission requirements may also be met prior to admission by taking courses as a non-matriculated student. Only students fully admitted into the Biology program are eligible for assistantships and tuition waivers.

Assistantships and Tuition Waivers

There are a limited number of competitively awarded assistantships and tuition waivers available. Please be sure to contact individual professors or the Program Coordinator for more information.

Degree Requirements

The program requires 30 credits with the following framework for thesis and non-thesis options:

Thesis Option

Course	Title	Credits
Coursework		18-24
Thesis research		6-12
Total Credits		**30**

Non-Thesis Option

Course	Title	Credits
Coursework		28
Independent study		2
Total Credits		**30**

The required courses for all students are: Biology Graduate Skills Seminar, Biology Colloquium, and University Biology Teaching. Students in the thesis track are expected to accomplish a body of work of publishable caliber within their field of expertise. Those in the non-thesis track must coordinate the design and completion of a 2-credit Independent Study and an accompanying literature review.

Students admitted to the Biology program can apply for up to 6 credits from their qualifying upper division undergraduate coursework to count toward the MS degree. The credits must be approved by their advisor and thesis committee. All students are required to maintain a 3.0 cumulative graduate grade point average on a 4.0 scale.

Curriculum Requirements

Students, along with their faculty advisor, will design a program of study in one or more of the following areas: animal or plant physiology, animal behavior, neurobiology, molecular and cell biology, bioinformatics, genetics, microbiology, development, and ecology. Students will complete coursework beyond the required courses in a variety of biology disciplines in accordance with their thesis topic and program of study. Along with their faculty advisor and graduate committee, students will determine the best course selections. Some of the current upper-division undergraduate courses are co-listed as graduate courses. Graduate students in the co-listed courses may be required to complete additional graduate-level assigned papers or projects. Graduate students can only enroll at the graduate 5000 level in co-listed courses. All coursework will require a grade of B or better to pass.

In addition to research and courses, students are expected to fulfill a teaching requirement and take the course University Biology Teaching. Students receiving graduate assistantship support are required to teach one lab section generally in an introductory course and assist in teaching an upper-level course each year they receive support. Students who are supported by other funding are only required to take University Biology Teaching.

Course Offerings

Course	Title	Credits
Required Courses		
Complete one of the following options:		5-15
Thesis Option (9-15 credits)		
BI 5000	Biology Graduate Skills Seminar	
BI 5105	Biology Colloquium	
BI 5810	University Biology Teaching	
BI 5950	Thesis Research - Biology	
Non-thesis Option (5 credits)		
BI 5000	Biology Graduate Skills Seminar	
BI 5105	Biology Colloquium	
BI 5810	University Biology Teaching	
BI 5910	Independent Study - Biology	
Elective Courses		
Complete 15-25 credits of the following:		15-25
BI 5110	Cell Structure and Function	
BI 5130	Ecology	
BI 5150	Animal Physiology	
BI 5160	Neurobiology	
BI 5170	Ecology and Development	
BI 5185	Molecular Biology	
BI 5380	Avian Ecology	
BI 5560	Special Topics Bio Sciences	
BI 5600	Current Environmental Issues	
BI 5620	Developmental Biology	
BI 5910	Independent Study - Biology	
Total Credits		**30**

Learning Outcomes

Program Objectives

You will develop research skills by investigating unanswered questions in the field of biology, becoming familiar with the latest biological methodology relating to your topic of choice, understanding the capabilities and limitations of these various methods, and learning to communicate biological concepts effectively both verbally and in writing. Our faculty in the biology department have exciting and vibrant research programs in fields of study including animal or plant physiology, animal behavior, neurobiology, molecular and cell biology, bioinformatics, genetics, microbiology, development, and ecology.

Outcomes

Upon completion of the program you will have the skills necessary to read and write scientific literature, ask and answer life sciences questions, and direct independent research projects. In addition, you will be prepared to progress into a PhD program or professional employment in your field of study.

Career Pathways

Coursework will prepare you to become a professional biologist by introducing you to the wide variety of skills needed to address current and future biological problems. The research emphasis will help further enhance your skills and contribute to the body of knowledge in the field of biology while preparing you for a PhD program or professional employment.