BIOLOGY, MS

Graduate Program Director

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Faculty

Yasir Ahmed-Braimah, David M. Althoff, Carlos A. Castañeda, Heather D. Coleman, Steve Dorus, Scott E. Erdman, Christopher W. Fernandez, Austin M. Garner, Sarah E. Hall, Heidi Hehnly, James A. Hewett, James Hougland, Li-En Jao, Eundeok Kim, L. James Lamit, Katharine Lewis, Chih Hung Lo, Sarah Kathleen Lucas, Jessica MacDonald, Heather Meyer, Lauren Mavica, Vera McIlvain, Angela M. Oliverio, Susan E. Parks, Melissa E. Pepling, Scott Pitnick, Ramesh Raina, Surabhi Raina, Roy D. Welch, Jason R. Wiles

The Department of Biology is committed to research-oriented graduate training of the highest quality. A wide variety of disciplines are offered within the areas of biochemistry, developmental biology, genetics, molecular and cellular biology, neuroscience, ecosystem ecology, behavioral ecology, and evolution. Many students pursue research questions that span two or more of these traditional subdisciplines. Each student's program is individually structured to provide the maximum flexibility in the choice of coursework consistent with high quality graduate scholarship.

The Department currently averages 50 full-time graduate students (Ph.D. and M.S.). About 75 percent of the students enroll directly following their undergraduate work; others come with a master's degree earned elsewhere.

Program graduates are encouraged to pursue a variety of career paths after obtaining their degrees. Our recent graduates have gone on to Ph.D. programs in a variety of universities and colleges. Other recent graduates have found employment in industry, in medical settings, and in environmental education, among other fields.

Admissions

Successful applicants generally have a minimum undergraduate average (GPA) of B (3.0). High scores on the verbal, quantitative, and analytical writing tests of the Graduate Record Examinations (GRE) may strengthen an application, although GRE scores are not required.

Applicants must also have earned a B.S. or a B.A. degree, and should have at least a minimal background in both physical and biological sciences, including the following: two years of biology, one year each of introductory chemistry, organic chemistry with laboratory, physics, and college-level calculus. Although not required, a year of biochemistry is desirable for students interested in cell and molecular biology, and training in statistical analysis is desirable for all students.

Special consideration is given to students who have conducted undergraduate research and whose recommendations attest to their skills in the laboratory or field and promise in research. Applicants whose scholarly interests are confluent with those of our Graduate Faculty will also receive priority consideration.

Student Learning Outcomes

1. Demonstrated ability in scientific methods and research - possess basic knowledge of how to approach the design and execution of experiments to robustly address biological research questions.
2. Possess sufficient knowledge in a subfield of the biological sciences to formulate and address contemporary biological research questions.
3. Ability to explain and analyze concepts from other related subfields of the biological sciences.
4. Develop communication and synthetic skills for presentation in oral, poster and written formats.
5. Demonstrate an awareness of matters associated with the ethical and responsible conduct of research.

M.S. in Biology

The Biology M.S. program requires a minimum of 24 credits of formal coursework (at least 12 credits at the 600-level or above) selected in consultation with the student's Research Committee, and 6 additional Master's Thesis credits (BIO 997).

Seminar requirements for M.S. students:

- BIO 608 Quantitative Methods for Life Scientists (3 credits)
- BIO 704 Scientific Writing for Graduate Students in the Life Sciences (3 credits)
- BIO 705 Graduate Research Seminars (0 to 1 credit) required each semester (fall and spring) in year 1, 2, 3 of program
- BIO 799 Seminar in General Biology (1 credit) required each semester (fall and spring) in year 1 and 2 of program
- Students are required to take 2 additional 3 -credit graduate research seminars in biology numbered 600 or 700 for 6 total credits

A thesis based on original research must be developed and successfully defended in accordance with the rules and regulations of the Syracuse University Graduate School. The maximum expected time in residence is three years.

M.S. in Biology - Neuroscience Concentration (Optional)

Students admitted into the Biology M.S. program may opt to complete coursework for the Interdisciplinary Graduate Neuroscience Concentration (I-GNC). If all requirements are completed, the M.S. degree will be awarded from the Biology Department with the “Neuroscience Concentration” listed on the final transcript as an area of specialization, along with the Biology M.S. degree.

Core Requirements

The Neuroscience Concentration constitutes a small set of core courses that each M.S. student will take. Apart from their academic aspects, these courses also create an opportunity for students and faculty from the different neuroscience disciplines to interact.

Code	Title	Credits
BIO 607	Advanced Neuroscience	3
BIO 624	Readings in Neuroscience	0-3
BIO 625	Interdisciplinary Methods of Neuroscience	0-3

In addition, I-GNC students are expected to:

- Participate in other research activities organized or sponsored by the I-GNC during their tenure as a student.
- Attend I-GNC-sponsored seminars given by outside speakers, other I-GNC graduate students, postdocs, and faculty.

Graduate Awards

Biology graduate students are guaranteed support for a specific number of years (i.e., 5 years for Ph.D., and 2 years for M.S.) as long as they maintain good standing in the program. Ph.D. students have the option of petitioning for an additional 5th year of support, if necessary.

During the academic year, most students are supported by a teaching assistantship for at least some semesters, and in many instances, for all semesters during their time in the program. Students may also be supported by their faculty research advisor's external grants or by Syracuse University fellowships. Applying to local and national programs for graduate fellowships is also strongly encouraged. Tuition costs are typically covered by tuition reduction credits, which are awarded as part of a teaching assistantship, research assistantship, or S.U. Fellowship.

Research Facilities

Shared research facilities currently include AAALAC-accredited animal facilities, a research greenhouse and growth chambers, a confocal microscope facility, extensive computing facilities, and local field experiment sites. Extensive facilities and instrumentation for carrying out modern biological research at the molecular, cellular, organismal, and population levels are available. Library holdings and computing facilities are readily accessible for student and faculty use. The Biology Department is housed in the Life Sciences Complex, a 210,000-square-foot building with dedicated and outstanding research and teaching space for the life sciences.