

# Biological Sciences

## Degrees Available at SIUE

- Master of Science in Biological Sciences
- Master of Arts in Biological Sciences
  - A secondary education biology teaching focus is available with our Master of Science in Education (MSEd) in Curriculum and Instruction.

## Program Format

The program coursework is offered as traditional daytime courses.

## Biological Sciences at SIUE

Graduate students in the Department of Biological Sciences may pursue a concentration in a variety of areas, including:

- cellular and molecular biology
- anatomy and physiology
- genetics
- evolution and ecology

The department and outdoor venues on our beautiful campus, situated on 2,660 acres, provide excellent opportunities for innovative biological study. The College of Arts and Sciences' outdoor classroom consists of a 75-acre lake, a 35-acre botanical garden and 380 acres of forest and restored grasslands set aside as a nature preserve. The Department of Biological Sciences is located in Science Building West, a modern, science education facility with fully equipped teaching and research labs. The department is also equipped with state-of-the-art technology in microscopy, physiology, histology, cell biology, microbiology, genetics and toxicology research, and includes extensive botanical and zoological teaching collections. Opportunities for plant and animal research are available in our greenhouse and vivarium facilities.

## Career Outlook

Numerous career and advanced training opportunities are available to persons holding a master's degree in biology. These include doctoral training in biology and in the health sciences; secondary and junior college teaching; environmental assessment; and employment in educational, industrial, and governmental laboratories and agencies.

Graduate degrees expand opportunities and salary ranges. Biology graduates are in high demand, with particularly strong career growth in the fields of genetics, forensic research and environmental biology.



## Graduate Faculty

### Graduate Program Director Peter Minchin, PhD

Community Ecology, Restoration Ecology, Biostatistics, Ecoinformatics

### Thomas Anderson, PhD

Population and Community Ecology, Aquatic Ecology

### Maurina Aranda, PhD

Cell Biology Education; STEM Education

### Kelly Barry, PhD

Plant Tissue Culture; Biology Curriculum and Teaching Strategies

### Paul Brunkow, PhD

Aquatic Ecology, Functional Ecology, Evolutionary Ecology

### Carrie Butts-Wilmsmeyer, PhD

Biostatistics and Bioinformatics

### Susanne DiSalvo, PhD

Microbial Symbiosis, Amoeba-bacteria Interactions, Bacteriophages

### Betsy Esselman, PhD

Plant Conservation Genetics, Plant Systematics and Taxonomy

### Rick Essner, PhD

Functional and Ecological Morphology

### Tom Fowler, PhD

Molecular Genetics and Cell Signaling in Fungi

### Amy Hubert, PhD

Molecular Biology of Stem Cells and Regeneration

### David Jennings, PhD

Endocrine Regulation, Evolution of Life History Strategies

### Luci Kohn, PhD

Quantitative Morphology, Evolution of Skeletal Morphology

### Kevin Krajniak, PhD

Physiology, Neuropeptides in Freshwater Molluscs and Arthropods

### Danielle N. Lee, PhD

Animal Behavior, Mammalogy, Urban Ecology

### Faith Liebl, PhD

Synapse Development, Glutamate Receptors

### Zhi-Qing Lin, PhD

Phytoremediation: Phytoextraction, Phytostabilization, Phytovolatilization

### Darron Luesse, PhD

Plant Molecular Biology, Plant Tropisms

### Vance McCracken, PhD

Gastrointestinal Microbiology, Mucosal Immunology

### Brittany Peterson, PhD

Microbiomics, Microbial Ecology, Insect Microbe Interactions

### Emily Petrucelli, PhD

Neurogenetics, Effects of Alcohol on Neural Transcription and Behavior

### Bill Retzlaff, PhD

Green Roof Systems

### Kurt Schulz, PhD

Forest Ecology, Ecological Restoration, Invasive Species

### Chris Theodorakis, PhD

Aquatic Ecotoxicology, Conservation Genetics, Molecular Ecology

### Jake Williams, PhD

Animal Physiology

*Faculty from other programs who have been granted adjunct status in biological sciences may also mentor graduate students in biological sciences.*

## Adjunct Graduate Faculty

### Robert Dixon, PhD

(Department of Chemistry) Biochemical Processes and Macromolecular Structure

### Chaya Gopalan, PhD

(School of Nursing, School of Ed., Health and Human Behavior)

Sex Differentiation, Ed. Research

### Guim Kwon, PhD

(School of Pharmacy)

Metabolic Regulation, Diabetes

### Barb McCracken, PhD

(School of Dental Medicine)

Smoking/Electronic Cigarettes and Oral Inflammation

### Joseph Schober, PhD

(School of Pharmacy)

Cancer Cell Motility, Microtubule and Actin Signaling

### Dan Welch, PhD

(School of Dental Medicine)

Control of Masticatory Behavior

### Kyong Sup Yoon, PhD

(Dept. of Env. Sciences) Environmental

Toxicology and Vector Biology

## Admission Requirements

- Graduate School application and \$40 fee
- Submission of all postsecondary academic transcripts
- Successful completion of a bachelor's degree prior to enrollment
- GPA of at least 2.8 on 4.0 scale preferred
- International Applicants: Proof of English Proficiency, minimum requirements are TOEFL (79), IELTS (6.5) or equivalent
- Statement of Purpose: A personal letter/statement summarizing the applicant's preparation and experience leading to the undertaking of a master's program of study at SIUE, and outlining the applicant's academic and career goals, highlighting the role that a master's degree in biological sciences at SIUE will serve in meeting those goals.
- At least two letters of recommendation, not including the prospective faculty mentor, preferably from instructors and/or individuals who are familiar with the applicant's academic and professional preparation for undertaking a master's program in the biological sciences (submitted directly by the recommenders).
- A faculty mentor's written agreement, submitted directly by the SIUE faculty member.
- Applicants with an undergraduate GPA below 2.8 on a 4.0 scale should provide additional justification for admission with clear evidence of potential for success. This may include, but is not limited to: General GRE scores completed within the previous two years, documented relevant work experiences, additional justification by a prospective faculty mentor, explanation of prior coursework record, and successful relevant graduate coursework. These applicants should contact the Graduate Program Director ([bio\\_grad@siue.edu](mailto:bio_grad@siue.edu)) on initiating an application with notice of the additional items that will be submitted for review.

Program application materials may be uploaded during the application process, but official transcripts must be sent directly from the school attended and test scores must be verifiable with the appropriate testing service. Please contact the Graduate Admissions Office with questions regarding the application submission process at [graduateadmissions@siue.edu](mailto:graduateadmissions@siue.edu).

All applicants must have a faculty member agree in writing to serve as a graduate mentor in order to be considered for acceptance. Therefore, applicants are encouraged to identify and contact prospective graduate mentors, preferably when all other application materials have been submitted, and to contact the biological sciences graduate program director ([bio\\_grad@siue.edu](mailto:bio_grad@siue.edu)) for assistance, if needed.

Students accepted into the biological sciences graduate program are expected to have completed coursework equivalent to the SIUE undergraduate biology degree requirements, or they may be expected to resolve any deficiencies by completing coursework beyond that required for the graduate degree. Upon admission to the program, the student shall consult with his/her mentor to review the student's academic record and develop a plan of coursework that will address any academic deficiencies.

For full consideration for assistantship support, all application materials including the mentor's written agreement should be submitted by February 1 for the following fall semester, and September 1 for the following spring semester. Applications

received after these dates will be considered for any remaining funding. The February 1 and September 1 dates are strongly recommended for all international applications to permit sufficient time for the approval process and visa requirements to be completed.

## Graduation Requirements

For the final examination in biological sciences for either the Master of Arts (MA) or the Master of Science (MS), students meet with their advisory committee for a public oral defense of the thesis or research paper.

## Curriculum

**Master of Arts (MA):** A student may earn an MA while following the thesis plan. The MA requires a minimum of 32 semester hours, of which at least 24 semester hours must be in biology. The MA also requires a reading knowledge of a foreign language. The foreign language requirement must be met at least three months prior to graduation by passing an examination offered by the Department of Foreign Languages and Literature.

**Master of Science (MS):** Thesis and non-thesis plans of study are available for fulfillment of the requirements of the MS. The thesis and non-thesis plans require a minimum of 32 semester hours, of which at least 24 semester hours must be in biology. There is no foreign language requirement for the MS.

## Thesis Plan

- At least nine semester hours in biology must be earned in courses numbered BIOL 415-490 or 514-590
- Required courses: BIOL 501, 502, and 503 must be completed. BIOL 595 or 596 must be completed twice, or in combination, and must be taken under at least two different faculty members. Completion of BIOL 592 at least twice is required.
- Electives: Eight additional elective semester hours may be needed to reach 32 semester hours.
- Thesis: Students must complete a thesis based on their original research, and must enroll in at least three semester hours of BIOL 599.

## Non-Thesis Plan

- At least 14 semester hours in biology must be earned in courses numbered BIOL 415-490 or 514-590
- Required courses: BIOL 501, 502, and 503 must be completed. BIOL 595 or 596 must be completed twice, or in combination, and must be taken under at least two different faculty members. Completion of BIOL 592 at least twice is required.
- Electives: Two additional elective semester hours may be needed to reach 32 semester hours.
- Research Paper: At least four, but no more than eight semester hours must be taken in BIOL 591 and 593, culminating in an acceptable final research paper.

## Contact Information

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