

# School of Biology and Biomedical Sciences

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## Contact Information

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**Room Number:** 101B

The School of Biology and Biomedical Sciences offers a **Master of Science degree in Biology**. This degree is not topic specific, and can cover subjects related to ecology, GIS, molecular biology, genetics, microbiology, or other specialties found in the department.

Students can choose one of the three degree options: thesis option, research project option, or course only option.

Additionally, the School of Biology and Biomedical Sciences offers a **Health Sciences Post-Baccalaureate Academic Certificate**. Students will receive the certificate upon completing all courses stated in course requirements and will be displayed on your university transcript.

Fiscal support for qualified graduate students is available through scholarships, research assistantships and teaching assistantships. Many research projects are funded through federal and private sources.

## Biology (BIOL)

### **BIOL 5102** Research Problems I **1 SCH (0-1)**

Individual problems assigned, defined and supervised by a Biology graduate faculty member with permission of the department chair. Provides experience in individual design, execution and reporting of small units of research of professional caliber. The Research Problems I, II and III courses may be repeated in any combination for a total maximum of 6 semester credit hours applied toward the Research Project and Course-Work Only degree plans, while Thesis degree plan students may take a maximum of 9 semester credit hours.

### **BIOL 5104** Graduate Seminar **1 SCH (0-1)**

An advanced study of biological literature and research with critical class reports. Must be taken for credit at least twice, but students may repeat the course up to a maximum of four times.

### **BIOL 5202** Research Problems II **2 SCH (0-2)**

Individual problems assigned, defined and supervised by a biology graduate faculty member with permission of the department chair. Provides experience in individual design, execution and reporting of small units of research of professional caliber. The Research Problems I, II and III courses may be repeated in any combination for a total maximum of 6 semester credit hours applied toward the Research Project and Course-Work Only degree plans, while Thesis degree plan students may take a maximum of 9 semester credit hours.

### **BIOL 5302** Advanced Topics in Biology **3 SCH (3-0)**

Lectures in selected topics. May be repeated for credit once under a different topic. Prerequisites: 12 semester hours of biology or equivalent.

### **BIOL 5305** Graduate Research Project **3 SCH (3)**

Designed for project option students and requires completion of research project. Prerequisite: departmental approval. May be repeated for a maximum of 6 semester hours.

### **BIOL 5306** Thesis **3 SCH (3)**

Designed for thesis option students. The course requires completion of thesis research. Prerequisite: departmental approval. May be repeated for maximum of 6 semester hours.

### **BIOL 5308** Advanced Molecular Genetics **3 SCH (3-0)**

This course will familiarize students with fundamental concepts of molecular genetics, including gene structure and diversity, transcription and advanced concepts in cellular and molecular genetics.

### **BIOL 5309** Epigenetics **3 SCH (3-0)**

This course will introduce fundamental concepts of epigenetics, including chromatin structure, DNA and histone modifications, and non-coding RNAs, and advanced concepts in gene expression regulation. Furthermore, this course will discuss up-to-date research articles to correlate concepts in epigenetics to practical examples.

### **BIOL 5311** Advanced Immunology **3 SCH (3-0)**

The fundamentals of immunology, including the anatomical, physiological, cellular and molecular aspects of both innate and adaptive immunity will be covered. Basic diagnostic tools, counter measures against infections, and provide an overview of human and animal immunity will also be discussed.

### **BIOL 5312** Advanced Bacteriology **3 SCH (3-0)**

A showcase of current topics in microbiology including antibiotic resistance, microbiome, metabolism, or any other topic agreed upon. Students will be expected to read, understand, and analyze published literature, present these papers in front of the class, and dissect the strengths and weaknesses of the published work.

**BIOL 5313 Biotechniques 3 SCH (3-2)**

Interactive lecture course in molecular biology for graduate students; introduction to tools and methodologies used in prokaryotic and eukaryotic molecular labs; choosing the appropriate experimental technique for a given scientific question; virtual experiments will reinforce the applications and introduce useful bioinformatics tools. Required for the Health Science Post-baccalaureate Certificate.

**BIOL 5314 Medical Anatomy & Physiology 3 SCH (3-2)**

Course will examine the relationships and organization of the human body at a level required for clinical medicine and basic research in medical physiology. The course covers normal physiology, as well as selected diseases. Organization of human anatomy is correlated with diagnostic imaging and pathophysiology. Counts as an elective for the Health Science Post-baccalaureate Certificate.

**BIOL 5315 Cell Biology 3 SCH (3-2)**

Fundamental concepts of neurobiology, including neuronal electrical signaling, synaptic transmission, signal transduction, neurotransmitter diversity, neural development, and synaptic function on a graduate level. Counts as an elective for the Health Science Post-baccalaureate Certificate.

**BIOL 5317 Medical Ethics 3 SCH (3-0)**

Grounding in the major theories and methods of bioethical decision-making, including contemporary controversies about the role of theory, principles, cases, narrative, and virtues. Required for the Health Science Post-baccalaureate Certificate.

**BIOL 5318 Medical Neurobiology 3 SCH (3-2)**

Fundamental concepts of neurobiology, including neuronal electrical signaling, synaptic transmission, signal transduction, neurotransmitter diversity, neural development, and synaptic function on a graduate level. Counts as an elective for the Health Science Post-baccalaureate Certificate.

**BIOL 5320 Research Problems III 3 SCH (0-3)**

Individual problems assigned, defined and supervised by a biology graduate faculty member with permission of the department chair. Provides experience in individual design, execution and reporting of small units of research of professional caliber. The Research Problems I, II and III courses may be repeated in any combination for a total maximum of 6 semester credit hours applied toward the Research Project and Course-Work Only degree plans, while Thesis degree plan students may take a maximum of 9 semester credit hours.

**BIOL 5321 Advanced Pathophysiology 3 SCH (3-2)**

Fundamental concepts of pathophysiology, including changes at the cellular, organ, system, and whole-organism levels during the disease state on a graduate level. Counts as an elective for the Health Science Post-baccalaureate Certificate.

**BIOL 5322 Infectious Disease 3 SCH (3-2)**

Lecture and research activities involving infectious disease and host immune response at the graduate level. Counts as an elective for the Health Science Post-baccalaureate Certificate.

**BIOL 5402 Advanced Topics in Biology 4 SCH (3-3)**

Lectures, literature, investigation and research at the graduate level in selected advanced topics. May be repeated for credit under different topics. Fee: \$20.00

## Graduate Programs

- Biology, M.S.

## Academic Certificates

- Health Sciences Post-Baccalaureate, Academic Certificate

## Planned Course Offerings

This section provides a comprehensive list of graduate courses offered by the School of Biology and Biomedical Sciences, along with a two-year schedule indicating when each course is expected to be available. Please note that course offerings and scheduling are subject to change based on faculty availability and student demand. To ensure steady progress toward degree completion, students are strongly encouraged to work closely with their advisor to develop a personalized academic plan.

### Biology (BIOL)

| Course                 | Fall 2026 | Spring 2027 | Fall 2027 | Spring 2028 |
|------------------------|-----------|-------------|-----------|-------------|
| BIOL 5102              | X         | X           | X         | X           |
| BIOL 5104              | X         | X           | X         | X           |
| BIOL 5202              | X         | X           | X         | X           |
| BIOL 5302              | X         | X           | X         | X           |
| BIOL 5305              | X         | X           | X         | X           |
| BIOL 5306              | X         | X           | X         | X           |
| BIOL 5308 <sup>1</sup> |           |             |           |             |
| BIOL 5309              |           | X           |           | X           |
| BIOL 5311              |           | X           |           |             |

|           |   |   |   |   |
|-----------|---|---|---|---|
| BIOL 5312 | X |   | X |   |
| BIOL 5313 | X |   | X |   |
| BIOL 5314 | X |   |   |   |
| BIOL 5315 |   |   | X |   |
| BIOL 5317 |   | X |   | X |
| BIOL 5318 | X |   |   |   |
| BIOL 5320 | X | X | X | X |
| BIOL 5321 |   | X |   |   |
| BIOL 5322 |   |   |   | X |
| BIOL 5402 | X | X | X | X |

<sup>1</sup> This course is available during the summer term only.