M.S. in Biological Sciences

Learning Outcomes

1. Mastery of the principles underlying modern Biology

Biology (MS) graduate students should have an understanding of the major fields within biology and how these fields are integrated to contribute to current perspectives in biology. Biology graduate students should understand how the scientific method can be used to answer questions in biology. Biology graduate students will understand how current biological concepts are supported by experimental findings. Biology graduate students know how to approach studying biological systems.

Outcomes: A biology graduate student should be able to explain, both orally and in writing:

- the major fields in biology and how they are interconnected
- the experimental approaches that are used to obtain biological data
- how experiments are designed to test hypotheses
- the levels of biological organization from biomolecules to ecosystems
- the mechanisms organisms use to transform energy
- the way in which evolutionary theory unifies biology
- how model systems are used to explore biology
- the way details of their focused research relates to the overall field of biology.

2. Intellectual and Critical Thinking

Biology (MS) graduate students will develop their critical thinking and analytical skills. They will synthesize observations and conclusions from the scientific literature to deepen their understanding of biology and to pose new questions in biology.

Outcomes: Biology graduate students will be able to:

- critically analyze and evaluate scientific findings
- devise testable hypotheses and the methods/approaches to test them
- use the appropriate measures/observations and statistical methods
- use existing knowledge to generate and synthesize new ideas and questions
- communicate experimental approaches, findings, and their significance
- execute an original research project resulting in a completed body of work described in a thesis and presented orally to a group of their peers and faculty members.

3. Integration of Learning

Biology (MS) graduate students will understand how the field of biology relates to other fields. They will understand the limitations of science. They will understand ethical practices and approaches in biological research.

Outcomes: Biology graduate students will be able to:

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relate their learning to multiple fields and realms of experience explain the limitations of science practice ethical approaches to obtaining scientific information.

4. Preparation for Career and Beyond

Biology (MS) graduate students will understand ways in which their knowledge can be applied and contribute to various career paths and society.

Outcomes: Biology graduate students will be able to:

set goals for future work that are the result of realistic self-appraisal and reflection articulate their skills and knowledge and represent themselves to external audiences work toward goals independently and in collaboration with others find career paths which will allow them to apply their knowledge and skill communicate biological concepts and facts to diverse audiences including the general public use their knowledge to enrich their life experiences and participate in public discourse.