

# Biology

## Master of Science

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The Department of Biology offers graduate studies leading to the Master of Science (thesis and non-thesis options). The mission of the Biology Graduate Program is to prepare our students well for careers in teaching and/or research in academics, government or industry, or for further graduate training. We strive for excellence in graduate education, mentorship and research across the breadth of biology, while focusing on strengths in vital sub-disciplines. We provide enriched, forward-looking graduate experiences in the areas of **Ecology, Evolution, and Conservation Biology** and **Molecular, Cellular, and Developmental Biology**. We strive to prepare students for the increasingly important integration of biological knowledge across levels of organization from molecules to the environment.

### Admission Requirements

1. Must meet current minimum general requirements as published by the Graduate School.
2. Must provide GRE General test scores. Strength of scores will be considered regarding admission and awarding of departmental support.
3. Minimum GPA of at least 2.75 for all undergraduate work or 3.0 for the junior - senior credits.
4. Students must indicate thesis vs. non-thesis option upon application. M.S. (thesis) students may request a change to M.S. (non-thesis) only within the first two semesters (not including summer) of enrollment. Such requests will be evaluated by the Graduate Director and the student's advisory committee. Students admitted to the M.S. program may, after one calendar year, and upon the recommendation of his/her advisory committee, request to by-pass the masters degree and work directly toward the Ph.D. degree. The same GRE and GPA requirements apply for bypass as for students applying for the doctoral program and through normal application procedures, i.e., a GPA no lower than 3.0 for work completed while in the M.S. program. The recommendation of the advisory committee shall be brought to a vote in a faculty meeting. A minimum of one week before such a meeting, the faculty shall be notified that the student's updated file shall consist of the materials used for application to the M.S. program, a transcript of all academic work completed at UND, and any additional materials the student wishes to have considered. Students seeking summer or fall admission should complete their applications by February 15. Students seeking spring admission should complete their applications by October 15. Master's degree applicants should specify interest in either the thesis or non-thesis option. Inquiries should be directed to the Director of Graduate Studies, Biology Department.

### Degree Requirements

Students seeking the Master of Science degree at the University of North Dakota must satisfy all general requirements set forth by the Graduate School as well as particular requirements set forth by the Biology Department. The Master of Science degree program is designed to produce broadly trained biologists for job opportunities or continued graduate study.

#### Thesis Option

The M.S. degree program with thesis requires the completion of a program of study of at least 30 semester credits beyond the baccalaureate degree. The program of study, prepared with the approval of a three-member faculty advisor committee, includes the following:

- a. A minimum of 30 credits including coursework, research and thesis with research and thesis accounting for no more than 50% of credits.
- b. A minimum of two (2) credits of BIOL 503 Seminar (credits included in a. above).
- c. Satisfactory completion of an acceptable thesis proposal (written proposal, proposal presentation and proposal defense) evaluated by the student's advisory committee.
- d. Satisfactory completion of a comprehensive examination administered by the student's advisory committee; and
- e. Satisfactory completion of an acceptable thesis (written thesis, thesis seminar and thesis defense) evaluated by the student's advisory committee.

#### Non-Thesis Option

This degree program is designed for students who wish to obtain broad training in graduate biology without research emphasis. The M.S. non-thesis degree program requires the completion of a program of study of at least 32 semester credits beyond the baccalaureate degree. The program of study prepared with the approval of a faculty supervisor, includes the following:

- a. At minimum of 32 credits of coursework.
- b. A minimum of two (2) credits of BIOL 503 Seminar (credits includes in a. above).
- c. A minimum of 23 credits in the major (credits included in a. above).
- d. BIOL 599 Research and BIOL 998 Thesis credits will not count toward the 32 credits.

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- e. Satisfactory completion of a comprehensive examination administered by the student's advisor and two other faculty members selected by the student with the concurrence of the advisor, the faculty members involved and the department chairperson.
- f. Satisfactory completion of an acceptable Independent Study. The Independent Study should be substantial and rigorous and involve a written report and a formal oral presentation to the Department.

## Faculty and Areas of Expertise

- **Jeffrey Carmichael, Ph.D.**, Reproductive processes in higher plants
- **Dane Crossley, Ph.D.**, Comparative animal physiology, ontogeny of cardiovascular function and regulation
- **Diane Darland, Ph.D.**, Developmental biology, cell-cell interactions in the central nervous system, and molecular regulation of neural and vascular development
- **Brett J. Goodwin, Ph.D., Graduate Program Director**, Landscape and spatial ecology, animal movement, simulation modeling
- **Steven Kelsch, Ph.D.**, Ecology, physiological ecology, systematics, management of fishes
- **John La Duke, Ph.D.**, Plant systematics, morphological and molecular phylogenetics of Malvaceae
- **Peter J. Meberg, Ph.D.**, Neural plasticity, regulation of actin dynamics during neural development
- **Katherine R. Mehl, Ph.D.**, Population dynamics and management of waterfowl
- **Robert A. Newman, Ph.D.**, Life history evolution, population ecology and genetics, conservation biology, amphibian ecology
- **Martha Potvin, Dean of Arts and Sciences**
- **Sally J. Pyle, Ph.D.**, Developmental neurobiology, neurotoxicology, interactions of the cytoskeleton
- **Stephen G. Ralph, Ph.D.**, Genomics, plant-animal interactions
- **Turk Rhen, Ph.D.**, Evolution of gender differences, comparative genomics, identification of evolutionarily conserved and unique genes involved in sex determination in vertebrates
- **Isaac J. Schlosser, Ph.D., Department Chair**, Aquatic ecology, fish population and community ecology, ecology of natural resources, conservation biology
- **William F. Sheridan, Ph.D.**, Genetics, developmental biology, the role of genes in maize development, mutational analysis of maize meiosis
- **Rebecca Simmons, Ph.D.**, Morphological and molecular systematics of lepidoptera, evolution of mimicry and courtship behaviors in insects
- **Vasyl Tkach, Ph.D.**, Parasite evolution, systematics, ecology and ultrastructure
- **Jefferson A. Vaughan, Ph.D.**, Various insects and ticks that transmit disease organisms to humans, livestock and wildlife

## Application Deadlines

Applications are accepted at any time. If you are seeking summer or fall admission and would like to be considered for an assistantship, you should complete your applications by February 15. If you are a Master's degree applicant you should specify interest in either the thesis or non-thesis option. Inquiries should be directed to the Director of Graduate Studies, Biology Department.

## Contact Information

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**Apply ONLINE**  
<http://graduateschool.und.edu>

Last Updated 9/12/09