

Biology

Doctor of Philosophy

The Department of Biology offers graduate studies leading to the Doctor of Philosophy degrees. 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. May enter the program with a Master's degree or directly with a Bachelor's degree.
3. All applicants seeking admission to the biology graduate program must provide GRE General test scores. Strength of scores will be considered regarding admission and awarding of departmental support.
4. Minimum GPA of 3.0 for the Master's degree work. If applying with only an undergraduate degree, must have a minimum GPA of 2.75 for all undergraduate work or 3.0 for junior - senior credits.

Degree Requirements

Students seeking the Doctor of Philosophy 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 Ph.D. degree program requires the completion of a program of study of at least 90 semester credits beyond the baccalaureate degree. The program of study, prepared with the approval of a five member faculty advisory committee, includes the following:

- a. A major area of a minimum 90 credits including coursework, research and dissertation structured at the committee's discretion but with a minimum of 18 semester credits of course work. Work completed in a master's program may be incorporated into the doctoral program if approved by the student's advisory committee.
- b. A minor is not required, but each student is expected to show competence in related areas as determined by the student's faculty advisory committee.
- c. A minimum of four (4) credits on BIOL 503 Seminar (included in a. above).
- d. Two scholarly tools. The nature of the scholarly tools shall be determined based upon their importance to the student's field of research as determined by the student's advisory committee.
- e. Satisfactory completion of an acceptable dissertation proposal (written proposal, proposal presentation and proposal defense) evaluated by the student's advisory committee.
- f. Satisfactory completion of a comprehensive examination administered by the student's advisory committee.
- g. Performance of research suitable for publication in refereed professional journals and satisfactory completion of an acceptable dissertation (written dissertation seminar and dissertation defense) based thereon.

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
- **Rick A. Sweitzer, Ph.D.**, Applied ecology and conservation, effects of exotic and introduced species, population and behavioral ecology of mammals
- **Vasyl Tkach, Ph.D.**, Parasite evolution, systematics, ecology and ultrastructure
- **Jefferson A. Vaughan, Ph.D.**, Various insects and ticks that can 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. 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