

## CAREER OPPORTUNITIES

Careers in scientific areas will increasingly depend on the ability to collaborate and network with interdisciplinary groups that perform a variety of interrelated tasks. Graduates of the MSc or PhD program in Applied Bioscience will be prepared for the growing demands of the workforce.

Potential career paths for Applied Bioscience graduates include the following:

- :: Industrial research and development;
- :: Academic positions;
- :: Financial services;
- :: Government agencies; and
- :: Intellectual property and law.



Thanks to UOIT partnership with the Royal Canadian Mounted Police and Yukon College in Whitehorse, Yukon, Katie Bygarski, a Master of Science student in UOIT's Applied Bioscience program spent two months conducting research in the Yukon. Bygarski carried out a forensic entomology study in Canada's north under the supervision of Dr. Helene LeBlanc, assistant professor, Forensic Science.

## We are here to help.

For a comprehensive list of courses, specific degree requirements and admission requirements for both the MSc and PhD programs in Applied Bioscience, please visit [www.gradstudies.uoit.ca](http://www.gradstudies.uoit.ca) or email us at [gradsecretary@science.uoit.ca](mailto:gradsecretary@science.uoit.ca).



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## PROGRAM FEATURES

The master's and doctoral degree in Applied Bioscience offered by UOIT's Faculty of Science have been developed from a unique collaborative program offered by an interdisciplinary network of chemists, biologists and health scientists. The primary objective is to train students to become high-quality researchers at the interface between chemistry and biology.



We expose our students to interdisciplinary research, allowing them to gain experience working successfully within collaborative networks. Our programs equip students with a wide array of both practical and conceptual scientific skills that prepares them for leadership roles in the life sciences. These goals are achieved through independent research in an area of application and rigorous interdisciplinary course work. The programs bring together students, researchers and faculty from a variety of scientific backgrounds, further enriching the learning experience.

**APPLIED BIOSCIENCE (MSc AND PhD)**  
[www.gradstudies.uoit.ca](http://www.gradstudies.uoit.ca)

## DEGREE REQUIREMENTS

### MSc PROGRAM

Students must successfully complete three, 3-credit courses and a research thesis that candidates will prepare and defend. The expected length of time for degree completion on a full-time basis is two years.

### PhD PROGRAM

Students must complete three courses and a research dissertation that constitutes a new contribution to the field of study. In addition, candidates will prepare and defend their thesis project. The expected length of time for degree completion on a full-time basis is four years.

### DIRECT TRANSFER FROM THE MSc PROGRAM TO THE PhD PROGRAM

This transfer option is for exceptional students who have demonstrated superior academic credentials and outstanding research potential in the first year of the master's degree program. Through this route, it is expected that the PhD degree requirements be completed within five years from the initial enrolment of the MSc graduate program.

## RESEARCH FIELDS

We offer four distinct research fields within Applied Bioscience.

### BIOMOLECULAR SCIENCE

- :: Using molecular, cellular, and chemical tools to investigate mechanisms of cell function;
- :: Novel drug discovery and synthesis, drug formulation and site-specific drug delivery;
- :: Designing biomaterials and bio-based products;
- :: The mechanisms of action of pharmaceuticals at the cellular and molecular level;
- :: The molecular and cellular aspects of the immune system in response to pathogenic and non-pathogenic micro-organisms; and
- :: Characterization of biomolecular interactions.

### ECOSYSTEM HEALTH

- :: Determining the implications of external toxicants on the health of ecosystems;
- :: Discovering indicators for environmental problems;
- :: Developing methods to lessen human exposure to toxicants;
- :: Investigate environmental microbiology; and
- :: Determining the micro and macro environmental factors causing disease.



### FORENSIC BIOSCIENCE

- :: Understanding the chemical processes which occur during decomposition;
- :: Studying arthropod biology and its application to legal investigations;
- :: Determining the effect of environmental variables on biological and chemical systems;
- :: Professional misconduct within the field of forensic science; and
- :: Developing techniques for recognizing and responding to threats to security and public safety.

### HUMAN HEALTH BIOLOGY

- :: Studying molecular mechanisms and treatment of infectious diseases;
- :: Understanding molecular mechanisms and therapeutic strategies in cancer;
- :: Developing diagnostic assays and therapeutic strategies for coagulopathies; and
- :: Studying and treating musculoskeletal disorders.

## WORLD-CLASS FACULTY AND RESEARCH

All 17 research-active faculty in UOIT's Applied Bioscience Graduate Program hold external grants for research funding, and two are Canada Research Chairs (CRC):

- :: Dr. Douglas Holdway is a Tier 1 CRC in Aquatic Toxicology. His research team focuses on developing a range of biomarkers that would permit the rapid detection of exposure and effects of chemicals on fish and other aquatic organisms; and
- :: Dr. Shari Forbes is a Tier 2 CRC in Decomposition Chemistry. Her research team focuses on the chemical breakdown processes that occur in soft tissue during decomposition, allowing for the development of biomarkers to provide more accurate estimates of the post-mortem period.

## SUPPORT AND FACILITIES

- :: Direct supervision and extensive student-faculty interaction;
- :: Flexible access and use of new high-tech laboratories and equipment;
- :: Hands-on experience; and
- :: All research expenses covered by UOIT.

### FINANCIAL SUPPORT

Students will receive a minimum of \$17,000 per year from various sources, which may include:

- :: Graduate scholarships from federal and provincial agencies;
- :: UOIT graduate scholarships;
- :: UOIT graduate research assistantships; and
- :: UOIT teaching assistantships.

Our faculty research programs are supported by government-led agencies.

