



## Life Science That Works

The Marine and Freshwater Biology co-op major provides a broad perspective on aquatic environments based on the physical as well as the biological sciences. Students build upon core courses in ecology, evolution, genetics, and physiology of aquatic biota as they study freshwater and marine environments and work with aquatic organisms experimentally in the field and in the lab. They perform independent research projects under a variety of field and laboratory conditions to enhance their learning experience and participate in co-op work terms to gain knowledge and skills in a workplace setting.

## University of Guelph Advantage

The Marine and Freshwater Biology major capitalizes on Guelph's recognized excellence in aquatic research. The state-of-the-art Hagen Aqualab on campus allows researchers and students to simulate global aquatic environments and maintain a wide variety of marine and freshwater flora and fauna in Guelph. This program prepares students for post-graduate work in the aquatic sciences and provides a sound scientific background for students pursuing careers in biology, management and conservation, aquaculture, biotechnology, education, and research in government, academic, or private sectors.

Students do not begin their first work term until they have completed 2 years of study and have mastered the core competencies needed to be successful in their work terms. Students are available for up to five work terms (4 or 8 months) and employers can post, interview and hire throughout the semester.

## Student Strengths

- Advanced understanding and appreciation of living aquatic organisms and specimens obtained through hands-on experience in the field and laboratory
- Knowledge of the structure, function, and evolutionary relationships of the major taxonomic groups of aquatic organisms
- Ability to characterize and integrate the diversity of biological, chemical, and physical features that structure marine and freshwater aquatic environments
- Ability to collect and assemble biological data and apply mathematical and statistical methods to the interpretation of data to address questions in aquatic biology

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# Marine and Freshwater Biology Course Sequencing

YEAR	FALL (SEPT-DEC)	WINTER (JAN-APRIL)	SUMMER (MAY-AUG)
<b>ONE</b>	<ul style="list-style-type: none"> <li>• GENERAL CHEMISTRY I</li> <li>• ELEMENTS OF CALCULUS I</li> <li>• PHYSICS FOR LIFE SCIENCES</li> <li>• DISCOVERING BIODIVERSITY</li> <li>• 1 LIBERAL EDUCATION ELECTIVE</li> </ul>	<ul style="list-style-type: none"> <li>• INTRODUCTION TO MOLECULAR AND CELLULAR BIOLOGY</li> <li>• GENERAL CHEMISTRY II</li> <li>• BIOLOGICAL CONCEPTS OF HEALTH</li> <li>• PHYSICS FOR LIFE SCIENCES II</li> <li>• 1 LIBERAL EDUCATION ELECTIVE</li> </ul>	<b>OFF</b>
<b>TWO</b>	<ul style="list-style-type: none"> <li>• ECOLOGY</li> <li>• EVOLUTION</li> <li>• INTRODUCTION TO CO-OPERATIVE EDUCATION</li> <li>• VERTEBRATE STRUCTURE AND FUNCTION</li> <li>• 2 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	<ul style="list-style-type: none"> <li>• INTRODUCTION TO BIOCHEMISTRY</li> <li>• FOUNDATIONS IN MOLECULAR BIOLOGY AND GENETICS</li> <li>• BIostatISTICS FOR INTEGRATIVE BIOLOGY</li> <li>• INVERTEBRATE MORPHOLOGY &amp; EVOLUTION</li> <li>• 1 ELECTIVE OR RESTRICTED ELECTIVE</li> </ul>	<b>WORK TERM ONE</b>
<b>THREE</b>	<ul style="list-style-type: none"> <li>• INTRODUCTION TO AQUATIC ENVIRONMENTS</li> <li>• COMPARATIVE ANIMAL PHYSIOLOGY I</li> <li>• LAB STUDIES IN ANIMAL PHYSIOLOGY I</li> <li>• INTEGRATIVE BIOLOGY OF NVERTEBRATES</li> <li>• 2 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	<b>WORK TERM TWO</b>	<b>WORK TERM THREE</b>
<b>FOUR</b>	<ul style="list-style-type: none"> <li>• LIMNOLOGY OF NATURAL AND POLLUTED WATERS</li> <li>• INTEGRATIVE MARINE AND FRESHWATER RESEARCH</li> <li>• 2 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	<ul style="list-style-type: none"> <li>• POPULATIONS, COMMUNITIES &amp; ECOSYSYEMS</li> <li>• DEVELOPMENTAL BIOLOGY</li> <li>• COMPARATIVE ANIMAL PHYSIOLOGY II</li> <li>• LAB STUDIES IN ANIMAL PHYSIOLOGY II</li> <li>• 2 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	<b>WORK TERM FOUR</b>
<b>FIVE</b>	<b>WORK TERM FIVE</b>	<ul style="list-style-type: none"> <li>• ADAPTATIONAL PHYSIOLOGY</li> <li>• BIOLOGY OF FISHES</li> <li>• MARINE ECOLOGICAL PROCESSES</li> <li>• 2 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	

BASED ON THE 2022/23 UNDERGRADUATE CALENDAR

PLEASE SEE THE CURRENT UNDERGRADUATE CALENDAR FOR MORE INFORMATION