



## Life Science That Works

Molecular Biology and Genetics explores the molecular biology of genomes and the genetics of microorganisms, plants, humans, and other animals, as well as the structure and function of cells. The Molecular Biology and Genetics major at the University of Guelph is truly an interdisciplinary program, with courses covering topics such as cell and molecular biology, genetics, developmental biology, and agricultural genetics. Students in the program have access to outstanding research facilities where they learn the practical skills and knowledge commonly used in the fields of biological and biomedical sciences, and they participate in co-op work terms to gain knowledge and skills in a workplace setting.

## University of Guelph Advantage

The Molecular Biology and Genetics major is offered within the Department of Molecular and Cellular Biology, home to many distinguished molecular biologists, geneticists, microbiologists, biochemists, and cellular and structural biologists.

- Faculty are known for their cutting-edge research in antibiotic resistance, vaccines and immunization, microbial ecology, and viruses.
- The University of Guelph is home to various advanced research centres, such as the Advanced Analysis Centre, Genomics Facility, and the Molecular & Cellular Imaging Facility.

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 four work terms (4, 8, or 12 months) and employers can post, interview, and hire throughout the semester.

## Student Strengths

- Advanced, contemporary, and relevant knowledge in Molecular Biology and Genetics, and an understanding of fundamental molecular and genetic processes.
- Practical laboratory skills, and the ability to analyze and interpret experimental results obtained in a laboratory setting.
- Strong written and verbal communication abilities.

recruit@uoguelph.ca  
519-824-4120 ext. 52323  
[uoguelph.ca/coop](https://uoguelph.ca/coop)

# Molecular Biology and Genetics Course Sequencing

YEAR	FALL (SEPT-DEC)	WINTER (JAN-APRIL)	SUMMER (MAY-AUG)
ONE	<ul style="list-style-type: none"> <li>INTRODUCTION TO MOLECULAR AND CELLULAR BIOLOGY</li> <li>GENERAL CHEMISTRY I</li> <li>ELEMENTS OF CALCULUS I</li> <li>PHYSICS FOR LIFE SCIENCES</li> <li>1 LIBERAL EDUCATION ELECTIVE</li> </ul>	<ul style="list-style-type: none"> <li>DISCOVERING BIODIVERSITY</li> <li>BIOLOGICAL CONCEPTS OF HEALTH</li> <li>GENERAL CHEMISTRY II</li> <li>PHYSICS FOR LIFE SCIENCES II</li> <li>1 LIBERAL EDUCATION ELECTIVE</li> </ul>	OFF
TWO	<ul style="list-style-type: none"> <li>INTRODUCTION TO CO-OPERATIVE EDUCATION</li> <li>INTRODUCTION TO BIOCHEMISTRY</li> <li>FOUNDATIONS IN MOLECULAR BIOLOGY AND GENETICS</li> <li>INTRODUCTION TO MICROBIOLOGY</li> <li>STATISTICS I</li> <li>1 LIBERAL EDUCATION ELECTIVE</li> </ul>	<ul style="list-style-type: none"> <li>STRUCTURE AND FUNCTION IN BIOCHEMISTRY</li> <li>ORGANIC CHEMISTRY I</li> <li>MOLECULAR BIOLOGY OF THE CELL</li> <li>METHODS IN MICROBIAL CULTURE AND PHYSIOLOGY</li> <li>1 LIBERAL EDUCATION ELECTIVE</li> </ul>	WORK TERM ONE
THREE	<ul style="list-style-type: none"> <li>MOLECULAR BIOLOGY OF THE GENE</li> <li>LABORATORY METHODS IN MOLECULAR BIOLOGY</li> <li>3 ELECTIVES/RESTRICTED ELECTIVES</li> </ul>	WORK TERM TWO	WORK TERM THREE
FOUR	WORK TERM FOUR	<ul style="list-style-type: none"> <li>5 ELECTIVES/RESTRICTED ELECTIVES</li> </ul>	OFF
FIVE	<ul style="list-style-type: none"> <li>5 ELECTIVES/RESTRICTED ELECTIVES</li> </ul>	<ul style="list-style-type: none"> <li>5 ELECTIVES/RESTRICTED ELECTIVES</li> </ul>	

## RESTRICTED ELECTIVES:

Physiology Elective - 0.50 credits

- Biomedical Physiology
- Plant Growth and Development
- Human Physiology I - Concepts and Principles
- Comparative Animal Physiology I

Subject Area Electives - 4.50 credits - of which 2.00 credits must be at the 4000 level

- Protein and Nucleic Acid Structure
- Population Genetics
- Applied Bioinformatics
- Fundamentals of Plant and Animal Genetics
- Human Genetics
- Quantitative Genetics
- Plant Genetics
- Genomics
- Animal Breeding Methods and Applications
- Genetics and Molecular Biology of Development
- Epigenetics
- Plant Breeding
- Applied Molecular Genetics in Medicine and Biotechnology
- Plant Molecular Genetics
- Dynamics of Cell Function and Signaling
- Advanced Cell Biology
- Research Project in Molecular and Cellular Biology I
- Research Project in Molecular and Cellular Biology
- Topics in Molecular and Cellular Biology
- Microbial Physiology and Genetics
- Microbial Cell Biology
- World of Viruses
- Molecular Virology
- Statistics II

BASED ON THE 2022/23 UNDERGRADUATE CALENDAR

PLEASE SEE THE CURRENT UNDERGRADUATE CALENDAR FOR MORE INFORMATION