



## Life Science That Works

Biochemistry is the study of processes associated with living cells at the molecular level. A sophisticated knowledge of biochemistry is central to many challenges of today, from biotechnology and genetic engineering to cancer research and drug design. Areas of study include such topics as the relationship of biomolecular structure to function, a molecular-level understanding of the transport of molecules and ions across membranes, and enzymology.

## University of Guelph Advantage

- Practical laboratory training in biochemistry, molecular biology and microbiology as well as opportunities to carry out exciting research projects with faculty members
- Faculty are internationally recognized for their cutting-edge research in areas such as biomembranes and biochemistry of cancer
- Faculty have won provincial and national awards for the quality of their teaching

Our co-op process responds to your needs. Employers can post, interview and hire throughout the semester and our students are available for 4 or 8 month work terms. The **Experience Guelph** hiring tool makes hiring Guelph co-op students easy!

## Student Strengths

- A sound knowledge of the theoretical foundations of the chemical sub-disciplines of analytical and organic chemistry as well as biochemistry and molecular biology
- Practical laboratory skills in biochemistry including enzymology and laboratory techniques in molecular biology
- Excellent communication and problem-solving experience

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[uoguelph.ca/coop](http://uoguelph.ca/coop)

# Biochemistry Course Sequencing

## Sequence A:

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>GENERAL CHEMISTRY II</li> <li>ELEMENTS OF CALCULUS II</li> <li>PHYSICS FOR LIFE SCIENCES II</li> <li>INTRODUCTION TO CO-OPERATIVE EDUCATION</li> <li>BIOLOGICAL CONCEPTS OF HEALTH</li> </ul>	OFF
TWO	<ul style="list-style-type: none"> <li>INTRODUCTION TO BIOCHEMISTRY</li> <li>ANALYTICAL CHEMISTRY I</li> <li>PHYSICAL CHEMISTRY</li> <li>FOUNDATIONS IN MOLECULAR BIOLOGY &amp; GENETICS</li> <li>1 LIBERAL EDUCATION ELECTIVE</li> </ul>	WORK TERM ONE	<ul style="list-style-type: none"> <li>ANALYTICAL BIOCHEMISTRY</li> <li>ORGANIC CHEMISTRY I</li> <li>INTRODUCTION TO MICROBIOLOGY</li> <li>STATISTICS I</li> <li>1 ELECTIVE OR RESTRICTED ELECTIVE</li> </ul>
THREE	<ul style="list-style-type: none"> <li>STRUCTURE AND FUNCTION IN BIOCHEMISTRY</li> <li>MOLECULAR BIOLOGY OF THE CELL</li> <li>ORGANIC CHEMISTRY II</li> <li>METHODS IN MICROBIAL CULTURE AND PHYSIOLOGY</li> <li>1 ELECTIVE OR RESTRICTED ELECTIVE</li> </ul>	WORK TERM TWO	WORK TERM THREE
FOUR	<ul style="list-style-type: none"> <li>LABORATORY METHODS IN MOLECULAR BIOLOGY I</li> <li>3 - 4 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	<ul style="list-style-type: none"> <li>ENZYMOLGY</li> <li>3 - 4 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	WORK TERM FOUR
FIVE	<ul style="list-style-type: none"> <li>5 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>		

## Sequence B:

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>GENERAL CHEMISTRY II</li> <li>ELEMENTS OF CALCULUS II</li> <li>PHYSICS FOR LIFE SCIENCES II</li> <li>INTRODUCTION TO CO-OPERATIVE EDUCATION</li> <li>BIOLOGICAL CONCEPTS OF HEALTH</li> </ul>	OFF
TWO	<ul style="list-style-type: none"> <li>INTRODUCTION TO BIOCHEMISTRY</li> <li>ANALYTICAL CHEMISTRY I</li> <li>PHYSICAL CHEMISTRY</li> <li>FOUNDATIONS IN MOLECULAR BIOLOGY &amp; GENETICS</li> <li>1 LIBERAL EDUCATION ELECTIVE</li> </ul>	WORK TERM ONE	<ul style="list-style-type: none"> <li>ANALYTICAL BIOCHEMISTRY</li> <li>ORGANIC CHEMISTRY I</li> <li>INTRODUCTION TO MICROBIOLOGY</li> <li>STATISTICS I</li> <li>1 ELECTIVE OR RESTRICTED ELECTIVE</li> </ul>
THREE	WORK TERM TWO	<ul style="list-style-type: none"> <li>STRUCTURE AND FUNCTION IN BIOCHEMISTRY</li> <li>MOLECULAR BIOLOGY OF THE CELL</li> <li>METHODS IN MICROBIAL CULTURE AND PHYSIOLOGY</li> <li>2 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	WORK TERM THREE
FOUR	<ul style="list-style-type: none"> <li>ORGANIC CHEMISTRY II</li> <li>4 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	<ul style="list-style-type: none"> <li>ENZYMOLGY</li> <li>LABORATORY METHODS IN MOLECULAR BIOLOGY</li> <li>2 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>	WORK TERM FOUR
FIVE	<ul style="list-style-type: none"> <li>5 ELECTIVES OR RESTRICTED ELECTIVES</li> </ul>		

RESTRICTED ELECTIVES: 9 COURSES FROM THE FOLLOWING LISTS:

EIGHT OF:

- METABOLIC PROCESSES
- PROTEIN AND NUCLEIC ACID STRUCTURE
- MEMBRANE BIOCHEMISTRY
- ADVANCED CELL BIOLOGY
- BIOMEDICAL PHYSIOLOGY
- RESEARCH PROJECT IN MOLECULAR AND CELLULAR BIOLOGY I
- RESEARCH PROJECT IN MOLECULAR AND CELLULAR BIOLOGY

- IMMUNOLOGY
- IMMUNOLOGY II
- APPLIED BIOINFORMATICS
- MOLECULAR BIOLOGY OF THE GENE
- DYNAMICS OF CELL FUNCTION AND SIGNALING
- TOPICS IN MOLECULAR AND CELLULAR BIOLOGY
- WORLD OF VIRUSES
- MOLECULAR VIROLOGY
- CROP PHYSIOLOGY

- GENETIC ENGINEERING OF PLANTS
- STATISTICS II
- APPLIED BIOINFORMATICS
- BIOCHEMICAL TOXICOLOGY
- MICROBIAL PHYSIOLOGY AND GENETICS

ONE OF:

- THERMAL PHYSICS
- BIOPHYSICS OF EXCITABLE CELLS
- ELECTRICITY AND MAGNETISM I
- GENERAL ASTRONOMY
- ENERGY

BASED ON THE 2021/22 UNDERGRADUATE CALENDAR

PLEASE SEE THE CURRENT UNDERGRADUATE CALENDAR FOR MORE INFORMATION