Biochemistry

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

recruit@uoguelph.ca
519-824-4120 ext. 52323
uoguelph.ca/coop
## Biochemistry Course Sequencing

### Stream A:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>FALL (SEPT-DEC)</th>
<th>WINTER (JAN-APRIL)</th>
<th>SUMMER (MAY-AUG)</th>
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</thead>
</table>
| ONE  | • INTRODUCTION TO MOLECULAR AND CELLULAR BIOLOGY  
      • GENERAL CHEMISTRY I  
      • ELEMENTS OF CALCULUS  
      • PHYSICS FOR LIFE SCIENCES  
      • 1 ARTS OR SOCIAL SCIENCE ELECTIVE | • DISCOVERING BIODIVERSITY  
      • GENERAL CHEMISTRY II  
      • ELEMENTS OF CALCULUS II  
      • PHYSICS FOR LIFE SCIENCES II  
      • INTRODUCTION TO CO-OPERATIVE EDUCATION  
      • BIOLOGICAL CONCEPTS OF HEALTH | OFF |
| TWO  | • INTRODUCTION TO BIOCHEMISTRY  
      • ANALYTICAL CHEMISTRY I  
      • PHYSICAL CHEMISTRY  
      • FOUNDATIONS IN MOLECULAR BIOLOGY & GENETICS  
      • 1 ARTS OR SOCIAL SCIENCE ELECTIVE | WORK TERM ONE | |
| THREE | • STRUCTURE AND FUNCTION IN BIOCHEMISTRY  
      • MOLECULAR BIOLOGY OF THE CELL  
      • ORGANIC CHEMISTRY III  
      • METHODS IN MICROBIAL CULTURE AND PHYSIOLOGY  
      • 1 ELECTIVE OR RESTRICTED ELECTIVE | WORK TERM TWO | WORK TERM THREE |
| FOUR | • LABORATORY METHODS IN MOLECULAR BIOLOGY I  
      • 3 - 4 ELECTIVES OR RESTRICTED ELECTIVES | • ENZYMOLGY  
      • 3 - 4 ELECTIVES OR RESTRICTED ELECTIVES | WORK TERM FOUR |
| FIVE | • 5 ELECTIVES OR RESTRICTED ELECTIVES | | |

### Stream B:

<table>
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<tr>
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| ONE  | • INTRODUCTION TO MOLECULAR AND CELLULAR BIOLOGY  
      • GENERAL CHEMISTRY I  
      • ELEMENTS OF CALCULUS  
      • PHYSICS FOR LIFE SCIENCES  
      • 1 ARTS OR SOCIAL SCIENCE ELECTIVE | • DISCOVERING BIODIVERSITY  
      • GENERAL CHEMISTRY II  
      • ELEMENTS OF CALCULUS II  
      • PHYSICS FOR LIFE SCIENCES II  
      • INTRODUCTION TO CO-OPERATIVE EDUCATION  
      • BIOLOGICAL CONCEPTS OF HEALTH | OFF |
| TWO  | • INTRODUCTION TO BIOCHEMISTRY  
      • ANALYTICAL CHEMISTRY I  
      • PHYSICAL CHEMISTRY  
      • FOUNDATIONS IN MOLECULAR BIOLOGY & GENETICS  
      • 1 ARTS OR SOCIAL SCIENCE ELECTIVE | WORK TERM ONE | |
| THREE | WORK TERM TWO | • STRUCTURE AND FUNCTION IN BIOCHEMISTRY  
      • MOLECULAR BIOLOGY OF THE CELL  
      • METHODS IN MICROBIAL CULTURE AND PHYSIOLOGY  
      • 2 ELECTIVES OR RESTRICTED ELECTIVES | WORK TERM THREE |
| FOUR | • ORGANIC CHEMISTRY II  
      • 4 ELECTIVES OR RESTRICTED ELECTIVES | • ENZYMOLGY  
      • LABORATORY METHODS IN MOLECULAR BIOLOGY I  
      • 2 ELECTIVES OR RESTRICTED ELECTIVES | WORK TERM FOUR |
| FIVE | • 5 ELECTIVES OR RESTRICTED ELECTIVES | | |

### 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  
- 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  

**ONE OF:**
- BIOCHEMICAL TOXICOLOGY  
- BACTERIAL GENETICS  
- THERMAL PHYSICS  
- BIOPHYSICS OF EXCITABLE CELLS  
- ELECTRICITY AND MAGNETISM I  
- GENERAL ASTRONOMY  
- ENERGY

**BASED ON THE 2020/21 UNDERGRADUATE CALENDAR**

**PLEASE SEE THE CURRENT UNDERGRADUATE CALENDAR FOR MORE INFORMATION**