

# HONOURS BSC BIOCHEMISTRY - CHEMICAL BIOLOGY OPTION

Biochemistry is the chemistry of life. It provides the foundation for understanding all biological processes as well as the molecular basis and treatment of human disease.

The biochemistry bachelor's provides you with the education you need to play a leading role in new and exciting areas of medical research. You will be exposed to cutting-edge research and knowledge. Our program prepares you for graduate studies and for an academic or research career in the medical sciences. What's more, biochemistry provides an excellent foundation for further studies in medicine and other areas of health care.

You can choose an Honours BSc in Biochemistry, a major or a minor.

If you want to pursue a career in experimental biochemistry, choose the Honours program. If you prefer a basic biochemistry education, choose a major. And if you want to focus on another discipline but are interested in biochemistry, choose a minor.

If you have a particular interest in microorganisms and the role that the immune system plays in health and disease, you can also choose an Honours BSc in biochemistry with an option in microbiology and immunology. We also offer an integrated biotechnology program that lets you combine studies in biochemistry and chemical engineering and receive both a BSc in biochemistry and a BASc in chemical engineering in five years.

As for the language of instruction, compulsory courses and many optional course units are available in either English or French.

If you choose the Honours in Biochemistry, you have the opportunity to complete a full-year research project under the supervision of a professor from the departments of Chemistry and Biomolecular Sciences, Biology, Physics, or Biochemistry, Microbiology and Immunology, or under the supervision of an affiliated principle investigator from one of the many research institutes in the National Capital Region. Given the breadth of research expertise within our program, you can conduct research in many areas of modern biomedicine, including biochemistry, microbiology, immunology, chemical biology, molecular biology, cell biology, proteomics, genomics, systems biology and bioinformatics.

This program is offered in English and in French.

## Program Requirements

Co-operative education is available with this program.

The French immersion stream is available with this program.

Requirements for this program have been modified. Please consult the 2022-2023 calendars (<https://catalogue.uottawa.ca/en/archives/>) for the previous requirements.

### Basic Skills

3 optional course units in English (ENG) at the 1000 or 2000 level 3 Units

### Compulsory courses at the 1000 level

BIO 1130 Introduction to Organismal Biology 3 Units

|          |  |         |
|----------|--|---------|
| BIO 1140 | Introduction to Cell and Molecular Biology | 3 Units |
| CHM 1311 | Principles of Chemistry                    | 3 Units |
| CHM 1321 | Organic Chemistry I                        | 3 Units |
| MAT 1330 | Calculus for the Life Sciences I           | 3 Units |
| MAT 1332 | Calculus for the Life Sciences II          | 3 Units |
| PHY 1321 | Principles of Physics I                    | 3 Units |

### Compulsory courses at the 2000 level

|          |  |         |
|----------|--|---------|
| BCH 2333 | Introduction to Biochemistry             | 3 Units |
| BIO 2133 | Genetics                                 | 3 Units |
| CHM 2120 | Organic Chemistry II                     | 3 Units |
| CHM 2123 | Laboratory of Organic Chemistry II       | 3 Units |
| CHM 2132 | Physical Chemistry for the Life Sciences | 3 Units |
| CHM 2354 | Analytical Chemistry                     | 3 Units |
| MAT 2379 | Introduction to Biostatistics            | 3 Units |

### Compulsory courses at the 3000 level

|          |   |         |
|----------|---|---------|
| BCH 3120 | General Intermediary Metabolism           | 3 Units |
| BCH 3125 | Protein Structure and Function            | 3 Units |
| BCH 3170 | Molecular Biology                         | 3 Units |
| BCH 3346 | Biochemistry Laboratory II                | 3 Units |
| BCH 3356 | Molecular Biology Laboratory              | 3 Units |
| BIO 3153 | Cell Biology                              | 3 Units |
| CHM 3120 | Intermediate Organic Chemistry            | 3 Units |
| CHM 3122 | Applications of Spectroscopy in Chemistry | 3 Units |

### Compulsory courses at the 4000 level

|                                |                                   |         |
|--------------------------------|-----------------------------------|---------|
| BCH 4116                       | Analytical Biochemistry           | 3 Units |
| BCH 4932                       | Biochemistry Seminar <sup>1</sup> | 3 Units |
| BPS 4129                       | Advanced Chemical Biology         | 3 Units |
| One option from the following: |                                   | 9 Units |

#### Option 1: Honours Project

BCH 4040 Honours Research - Biochemistry <sup>2</sup>

#### Option 2: Honours Project Substitution

3 course units from:

BPS 4104 Bioinformatics Laboratory

BPS 4127 Advanced Techniques in Biosciences

and 6 optional course units at the 3000 or 4000 level in science

### Optional courses

3 course units from: 3 Units

PHY 1322 Principles of Physics II

PHY 2325 Physics in Biology

3 course units from: 3 Units

BCH 4101 Human Genome Structure and Function

BCH 4122 Structural Biology of Proteins

BCH 4124 Carbohydrates and Glycobiology

BCH 4125 Cellular Regulation and Control

BCH 4126 Structural Biology of Membranes

### Electives

9 elective course units from the Faculty of Arts, Faculty of Education, Faculty of Law, Faculty of Social Sciences or the Telfer School of Management 9 Units

18 elective course units 18 Units

**Total: 120 Units**

Note(s)

1

This course runs from September to April.

2

BCH 4040 is highly recommended. A minimum CGPA of 6.5 or greater or a GPA of 6.5 or greater calculated from the two most recent years of full-time study in the Honours Biochemistry program (minimum of 54 units including all compulsory all compulsory 3000 level courses) is required. This course runs from September to April.