

# HONOURS BSC IN BIOMEDICAL SCIENCE (RESEARCH FOCUS) - CELLULAR AND MOLECULAR MEDICINE OPTION

Biomedical Science is an interdisciplinary program that focuses on the fundamentals of human structure and function, as well as those of other animals. The first two years provide a background in human anatomy and psychology, in addition to more in-depth knowledge in basic sciences like biology, chemistry, biochemistry, and mathematics. At the end of second year, in addition to courses in biology and biochemistry, students may choose to enter an option within the biomedical sciences program (Neuroscience, Cellular and Molecular Medicine, Bioanalytical Science, Medicinal Chemistry or Biostatistics). The Research Focus is ideal for students thinking of a career in research, as it consists of an immersive research experience in the third and fourth years that will equip students with advanced research, analysis and communication skills applicable to diverse careers. On graduation, they will be ready for more advanced research training or for admission to a professional program in human health.

Admission to this program is competitive and higher averages are required.

This program is offered in English and in French.

## Program Requirements

The French immersion stream is available with this program.

Requirements for this program have been modified. Please consult the 2023-2024 calendars (<http://catalogue.uottawa.ca/en/archives/>) for the previous requirements.

### Basic Skills

3 optional course units in English (ENG) at the 1000 or 2000 level, excluding ENG 1112 and ENG 1131	3 Units
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### Compulsory Courses at the 1000 level

ANP 1111	Essentials of Human Anatomy and Physiology I	3 Units
ANP 1115	Essentials of Human Anatomy and Physiology II	3 Units
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
PSY 1101	Introduction to Psychology: Foundations	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
MAT 2379	Introduction to Biostatistics	3 Units

PHI 2396	Bioethics	3 Units
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### Compulsory Courses at the 3000 level

BCH 3120	General Intermediary Metabolism	3 Units
BIM 3009	Research Practicum	6 Units
BIO 3124	General Microbiology	3 Units
BIO 3153	Cell Biology	3 Units
BIO 3170	Molecular Biology	3 Units
PHS 3341	Physiology of Sensation, Regulation Mechanisms, Movement and Reproduction	3 Units
PHS 3342	Physiological Regulation of Intake, Distribution, Protection and Elimination	3 Units

### Compulsory Courses at the 4000 level

BIM 4009	Research Project - Biomedical Science	9 Units
BIM 4920	Seminar I Evaluating Science	1.5 Units
BIM 4921	Seminar II Developing and Communicating Science	1.5 Units
BIO 4158	Applied Biostatistics	3 Units
PHA 4107	Introductory Pharmacology - Drugs and Living Systems	3 Units

### Optional Courses

3 course units from:	3 Units
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PSY 1102	Introduction to Psychology: Applications
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PSY 2114	Lifespan Psychology
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3 course units from:	3 Units
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BPS 2110	Introduction to Biopharmaceutical Science
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PHY 1321	Principles of Physics I
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PHY 1322	Principles of Physics II
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3 course units from:	3 Units
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BCH 3356	Molecular Biology Laboratory
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BIO 3151	Molecular Biology Laboratory
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3 course units from:	3 Units
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BIO 3360	Computational Tools for Biological Sciences
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BPS 4104	Bioinformatics Laboratory
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BPS 4127	Advanced Techniques in Biosciences
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12 optional course units from the list of optional courses	12 Units
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3 optional course units at the 3000 or 4000 level offered by the Faculty of Science <sup>1,2</sup>	3 Units
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### Elective Courses

6 elective course units	6 Units
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<b>Total:</b>	<b>120 Units</b>
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Notes(s)

<sup>1</sup>

The following courses are considered as science courses: CMM 3350, CMM 4360, MIC 4100, MIC 4124, MIC 4125, MIC 4126, PHA 4107, PHS 3300, PHS 3341, PHS 3342, PHS 4336.

<sup>2</sup>

The course SCI 3101 is considered a science optional course.

## List of Optional Courses

BCH 3125	Protein Structure and Function	3 Units
BCH 4101	Human Genome Structure and Function <sup>1</sup>	3 Units
BCH 4122	Structural Biology of Proteins	3 Units

BCH 4123	Pathological Biochemistry	3 Units
BCH 4125	Cellular Regulation and Control	3 Units
BCH 4188	Synthetic Biology	3 Units
BIM 4103	Selected Topics in Biomedical Science	3 Units
BIM 4115	Topics in Molecular Genetics	3 Units
BIM 4316	Modern Bioanalytical Chemistry	3 Units
BIM 4537	Génétique évolutive humaine	3 Units
BIO 3102	Molecular Evolution	3 Units
BIO 3360	Computational Tools for Biological Sciences	3 Units
BIO 4109	Advanced Topics in Animal Development	3 Units
BPS 3101	Genomics	3 Units
BPS 4101	Human Genome Structure and Function <sup>1</sup>	3 Units
BPS 4103	Selected Topics in Biopharmaceutical Science	3 Units
BPS 4104	Bioinformatics Laboratory	3 Units
BPS 4105	Human Toxicology and Environmental Health	3 Units
BPS 4127	Advanced Techniques in Biosciences	3 Units
BPS 4129	Advanced Chemical Biology	3 Units
BPS 4131	Advanced Biopharmaceutical Science	3 Units
PHS 4336	Reproductive Physiology	3 Units

Note(s)

1

The courses BCH 4101, BPS 4101 cannot be combined for credits.