HONOURS BSC BIOMEDICAL SCIENCE (RESEARCH FOCUS) - MEDICINAL CHEMISTRY 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.

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

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

Basic Skills

level, excluding ENG 1112 and ENG 1131		
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
PHY 1321	Principles of Physics I	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
CHM 2123	Laboratory of Organic Chemistry II	3 Units
CHM 2132	Physical Chemistry for the Life Sciences	3 Units

CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum 61 BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory 3 course units from: CHM 3126 Laboratory of Organic Chemistry CHM 3127 Laboratory of Organic Chemistry - Research Option 3 course units from: PSY 1102 Introduction to Psychology: Applications PSY 2114 Lifespan Psychology 3 optional course units at the 3000 or 4000 level offered by the Faculty of Science 1.2 Elective Courses	otal:		120 Unit
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory 3 course units from: CHM 3126 Laboratory of Organic Chemistry CHM 3127 Laboratory CHM 3128 Laboratory CHM 3128 Labora	6 elective course units		6 Unit
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory 3 course units from: CHM 3126 Laboratory of Organic Chemistry CHM 3127 Laboratory of Organic Chemistry CHM 3128 Lifespan Psychology 3 optional course units from the list of optional courses 3 optional course units at the 3000 or 4000 level offered by	ective Cours	es	
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry 3 UNION COMPULSORY COMPU			3 Unit
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry 3 UNION COMPULSORY COMPU			3 Unit
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry 3 Intermediate Organic Chemistry CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory 3 course units from: CHM 3126 Laboratory of Organic Chemistry — Research Option 3 course units from: CHM 3127 Laboratory of Organic Chemistry — Research Option 3 course units from: 3 Introduction to Psychology: Applications			0.11
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry 3 Intermediate Organic Chemistry CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory 3 course units from: CHM 3126 Laboratory of Organic Chemistry - Research Option 3 course units from: 3 Intermediate Organic Chemistry - Research Option 3 course units from:		, 3, 11	
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry 3 I CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory 3 course units from: CHM 3126 Laboratory of Organic Chemistry - Research Option			3 Unit
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry CHM 3120 Applications of Spectroscopy in Chemistry CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory 3 course units from:	(Option	
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry CHM 3120 Applications of Spectroscopy in Chemistry CHM 3121 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory BIO 3151 Molecular Biology Laboratory	CHM 3126 L	_aboratory of Organic Chemistry	
CHM 2354 Analytical Chemistry MAT 2379 Introduction to Biostatistics PHI 2396 Bioethics Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism BIM 3009 Research Practicum BIO 3170 Molecular Biology CHM 3120 Intermediate Organic Chemistry CHM 3120 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science BIM 4920 Seminar I Evaluating Science BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics CHM 4123 Medicinal Chemistry PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses 3 course units from: BCH 3356 Molecular Biology Laboratory	course units	from:	3 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3120 Intermediate Organic Chemistry 3 to Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science 9 to BIM 4920 Seminar I Evaluating Science 1.5 to BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics 3 to CHM 4123 Medicinal Chemistry 3 to Chemistry 4 to Chemistry 4 to Chemistry 5 to Chemistry 6 to Chemistry 7 to Chemistry 7 to Chemistry 7 to Chemistry 7 to Chemistry 8 to Chemistry 8 to Chemistry 9 to Chem	BIO 3151 N	Molecular Biology Laboratory	
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3120 Intermediate Organic Chemistry 3 to Chm 3122 Applications of Spectroscopy in Chemistry 3 to Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science 9 to BIM 4920 Seminar I Evaluating Science 1.5 to BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics 3 to CHM 4123 Medicinal Chemistry 3 to PHA 4107 Introductory Pharmacology - Drugs and Living Systems Optional Courses	BCH 3356 N	Molecular Biology Laboratory	
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3122 Applications of Spectroscopy in Chemistry 3 to Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science 9 to BIM 4920 Seminar I Evaluating Science 1.5 to BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics 3 to CHM 4123 Medicinal Chemistry 3 to PHA 4107 Introductory Pharmacology - Drugs and Living Systems	course units	from:	3 Unit
CHM 2354 Analytical Chemistry 3 MAT 2379 Introduction to Biostatistics 3 Interpretation 3 Introductory Pharmacology - Drugs and Living 3 Introductory Ph	otional Cours	es	
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3120 Intermediate Organic Chemistry 3 to Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science 9 to BIM 4920 Seminar I Evaluating Science 1.5 to BIM 4921 Seminar II Developing and Communicating Science BIO 4158 Applied Biostatistics 3 to BIM 4158 Applied Biostatistics 4 to			3 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3122 Applications of Spectroscopy in Chemistry 3 to Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science 9 to BIM 4920 Seminar I Evaluating Science 1.5 to BIM 4921 Seminar II Developing and Communicating Science	HM 4123 N	Medicinal Chemistry	3 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIM 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3122 Applications of Spectroscopy in Chemistry 3 to Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science 9 to BIM 4920 Seminar I Evaluating Science 1.5 to BIM 4921 Seminar II Developing and Communicating 1.5 to BIM 4921 Seminar II Developing 4 to BIM 4921	O 4158	Applied Biostatistics	3 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3122 Applications of Spectroscopy in Chemistry Compulsory Courses at the 4000 level BIM 4009 Research Project - Biomedical Science 9 to Research Project -			1.5 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to Compulsory Courses at the 4000 level	M 4920	Seminar I Evaluating Science	1.5 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to CHM 3122 Applications of Spectroscopy in Chemistry 3 to Management of Spectroscopy in Chemistry 3 to CHM 3122 Applications of Spectroscopy in Chemistry 3 to MATCH 2354 Applications of	M 4009 F	Research Project - Biomedical Science	9 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to BIO 3170 Molecular Biology 3 to CHM 3120 Intermediate Organic Chemistry 3 to BIM 3009 Research Practicum 3 to BIM 3009 Research Practicum 3 to BIM 3009 Research Practicum 3 to BIM 3120 Intermediate Organic Chemistry 3 to BIM 3120 Intermediate Organic	ompulsory Co	ourses at the 4000 level	
CHM 2354 Analytical Chemistry 3 UMAT 2379 Introduction to Biostatistics 3 UMAT 2379 Bioethics 3 UMAT 2396 BIOM 3120 General Intermediary Metabolism 3 UMAT 2396 BIM 3009 Research Practicum 6 UMAT 2397 BIO 3170 Molecular Biology 3 UMAT 2397 BIO 3170	HM 3122	Applications of Spectroscopy in Chemistry	3 Unit
CHM 2354 Analytical Chemistry 3 to MAT 2379 Introduction to Biostatistics 3 to PHI 2396 Bioethics 3 to Compulsory Courses at the 3000 level BCH 3120 General Intermediary Metabolism 3 to BIM 3009 Research Practicum 6 to R	HM 3120 I	ntermediate Organic Chemistry	3 Unit
CHM 2354 Analytical Chemistry 3 UMAT 2379 Introduction to Biostatistics 3 UMAT 2396 Bioethics 3 UMAT 2396 Bioe	O 3170 N	Molecular Biology	3 Unit
CHM 2354 Analytical Chemistry 3 UMAT 2379 Introduction to Biostatistics 3 UMAT 2396 Bioethics 3 UCompulsory Courses at the 3000 level		-	6 Unit
CHM 2354 Analytical Chemistry 3 UMAT 2379 Introduction to Biostatistics 3 UMAT 2396 Bioethics 3 UMAT 2396 Bioethics	• •		3 Unit
CHM 2354 Analytical Chemistry 3 UMAT 2379 Introduction to Biostatistics 3 U	ompulsory Co	ourses at the 3000 level	
CHM 2354 Analytical Chemistry 3 U	==		3 Unit
-		, ,	3 Unit
			3 Unit
CHM 2311 Introduction to Structure and Bonding 3 U	HM 2311 I	ntroduction to Structure and Bonding	3 Uni

Note(s)

1

3 Units

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

2

The course SCI 3101 is considered a science optional course.

List of Optional Courses

BCH 4123	Pathological Biochemistry	3 Units
BIM 4103	Selected Topics in Biomedical Science	3 Units
BIM 4316	Modern Bioanalytical Chemistry	3 Units
BPS 3350	Transition Metal Chemistry	3 Units
BPS 4103	Selected Topics in Biopharmaceutical Science	3 Units
BPS 4105	Human Toxicology and Environmental Health	3 Units

This is a copy of the 2024-2025 catalog.

BPS 4121	Biosynthesis and Natural Product Derived Medicines	3 Units
BPS 4126	Synthetic and Medicinal Chemistry Laboratory	3 Units
BPS 4129	Advanced Chemical Biology	3 Units
BPS 4131	Advanced Biopharmaceutical Science	3 Units
CHM 4139	Enzyme Chemistry and Biocatalysis	3 Units
CHM 4141	Computational Chemistry I	3 Units
CHM 4317	Organometallic Chemistry	3 Units
CHM 4319	Bio-Inorganic Chemistry	3 Units
CHM 4354	Principles of Instrumental Analysis	3 Units