

# HONOURS BSC CHEMISTRY - ECOCHEMISTRY OPTION

Chemistry is a modern, dynamic and diverse field that involves investigating the substances that make up our physical world and how they change. Chemistry touches everything we come into contact with. It is connected to almost all areas of science and engineering. For example, chemists play a vital role in developing new drugs, understanding and modifying biological processes and making materials for advanced electronic devices. Chemists are also important players in such diverse areas as genetic engineering, forensic science and the oil and gas industry. More recently, chemists have been at the forefront of nanotechnology and emerging green technologies, particularly in the development of sustainable energy sources.

The Department of Chemistry and Biomolecular Sciences at the Faculty of Science offers chemistry, biochemistry and biopharmaceutical science programs with unique options in medicinal chemistry, genomics, advanced materials chemistry, ecochemistry and chemical biology. In addition to classroom teaching, programs offer practical laboratory training with a focus on individual instruction.

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 2025-2026 calendars (<https://catalogue.uottawa.ca/en/archives/>) for the previous requirements.

### Compulsory courses at the 1000 level

BIO 1131	Introduction to Organismal Biology	3 Units
BIO 1150	BioZoo: An Introduction Laboratory in Biology	3 Units
CHM 1311	Principles of Chemistry	3 Units
CHM 1321	Organic Chemistry I	3 Units
GEO 1115	Introduction to Earth Materials	3 Units
One option from the following:		6 Units

#### Option 1:

MAT 1320 Calculus I

MAT 1322 Calculus II

#### Option 2:

MAT 1330 Calculus for the Life Sciences I

MAT 1332 Calculus for the Life Sciences II

One option from the following: 6 Units

#### Option 1:

PHY 1121 Fundamentals of Physics I

PHY 1122 Fundamentals of Physics II

#### Option 2:

PHY 1321 Principles of Physics I

PHY 1322 Principles of Physics II

### Compulsory courses at the 2000 level

BIO 2129	Ecology	3 Units
CHM 2120	Organic Chemistry II	3 Units

CHM 2123	Laboratory of Organic Chemistry II	3 Units
CHM 2131	Chemical Thermodynamics of Gases and Solutions	3 Units
CHM 2313	Environmental Chemistry	3 Units
CHM 2330	Physical Chemistry: Introduction to the Molecular Properties of Matter	3 Units
CHM 2353	Descriptive Inorganic Chemistry	3 Units
CHM 2354	Analytical Chemistry	3 Units

### Compulsory courses at the 3000 level

CHM 3120	Intermediate Organic Chemistry	3 Units
CHM 3122	Applications of Spectroscopy in Chemistry	3 Units
CHM 3128	Catalysis and Sustainable Chemical Manufacturing	3 Units
CHM 3350	Transition Metal Chemistry	3 Units

### Compulsory courses at the 4000 level

CHM 4129	Chemistry of Sustainable Energy	3 Units
CHM 4354	Principles of Instrumental Analysis	3 Units
One option from the following:		9 Units

#### Option 1: Honours Project

CHM 4010 Research Project <sup>1</sup>

#### Option 2: Honours Project Co-op Option

CHM 4016 Research Project

and 3 optional course units in chemistry (CHM) at the 3000 or 4000 level

6 optional course units from: 6 Units

CHM 3140 Quantum Chemistry and Molecular Modelling

CHM 3373 Molecular Spectroscopy and Statistical Mechanics

CHM 4123 Medicinal Chemistry

CHM 4139 Enzyme Chemistry and Biocatalysis

CHM 4155 Polymer and Applied Chemistry

CHM 4182 Molecular Dynamics in Chemistry

CHM 4311 Selected Topics in Inorganic Chemistry

CHM 4317 Organometallic Chemistry

CHM 4325 Advanced Organic Synthesis and Reaction Mechanisms

CHM 4380 Advanced Characterization Methods in Material Science and Catalysis

CHM 4381 Photochemistry and Photobiology

6 optional course units from the list of optional courses below 6 Units

12 elective course units offered by the Faculty of Arts, the Faculty of Education, the Faculty of Law, the Faculty of Social Sciences or the Telfer School of Management 12 Units

18 elective course units <sup>2</sup> 18 Units

**Total: 120 Units**

Note(s)

<sup>1</sup> Project related to Ecochemistry is strongly recommended.

<sup>2</sup> Although the program is well suited for future graduate work, for students intending to pursue graduate studies in chemistry, it is highly recommended to take 6 of their elective course units from the list of chemistry (CHM) courses in their area of interest at the 4000 level.

## List of Optional Courses

BCH 2333	Introduction to Biochemistry	3 Units
BIO 1141	Introduction to Cell and Molecular Biology	3 Units
BIO 3117	Ecosystem Ecology	3 Units
BIO 4146	Ecotoxicology	3 Units
BPS 4121	Biosynthesis and Natural Product Derived Medicines	3 Units
BPS 4123	Phytomedicines and Natural Product Drugs	3 Units
CHM 3140	Quantum Chemistry and Molecular Modelling	3 Units
CHM 3373	Molecular Spectroscopy and Statistical Mechanics	3 Units
CHM 4123	Medicinal Chemistry	3 Units
CHM 4139	Enzyme Chemistry and Biocatalysis	3 Units
CHM 4155	Polymer and Applied Chemistry	3 Units
CHM 4182	Molecular Dynamics in Chemistry	3 Units
CHM 4311	Selected Topics in Inorganic Chemistry	3 Units
CHM 4317	Organometallic Chemistry	3 Units
CHM 4325	Advanced Organic Synthesis and Reaction Mechanisms	3 Units
CHM 4380	Advanced Characterization Methods in Material Science and Catalysis	3 Units
CHM 4381	Photochemistry and Photobiology	3 Units
CVG 2132	Fundamentals of Environmental Engineering	3 Units
DVM 2105	Introduction to International Development: Historical Perspectives	3 Units
DVM 3125	Environmental Policies, Natural Resources Management and Sustainable Development	3 Units
ECO 2121	Introduction to International Economics	3 Units
ENV 1101	Global Environmental Challenges	3 Units
ENV 3101	Legal Context of Environmental Issues	3 Units
ENV 4118	Environmental Impact Assessment <sup>1</sup>	3 Units
EVS 1101	Introduction to Environmental Science	3 Units
GEG 1301	The Physical Environment	3 Units
GEG 3302	Natural Resource and Environmental Management	3 Units
GEG 4118	Environmental Impact Assessment <sup>1</sup>	3 Units
GEO 1111	Introduction to Earth Systems	3 Units
GEO 2163	Introduction to Mineralogy	3 Units
GEO 2166	Oceanography	3 Units
GEO 2307	Environmental Geology	3 Units
GEO 2334	Quaternary Geology and Climate Change	3 Units
GEO 3167	Mineral Deposits	3 Units
GEO 3342	Introduction to Hydrogeology	3 Units
GEO 3382	Geochemistry	3 Units
HIS 2129	Technology, Society and Environment Since 1850	3 Units
POL 1102	Politics and Globalization	3 Units
SOC 4310	Globalization and the Environment	3 Units
STA 2392	Introduction to Biostatistics	3 Units

<sup>1</sup> No more than 3 course units from ENV 4118, GEG 4118.