

HONOURS BSC CHEMISTRY - OPTION ADVANCED MATERIALS

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 2018-2019 calendars (<https://catalogue.uottawa.ca/en/archives/>) for the previous requirements.

| | | |
|--------------------------------|--|---------|
| CHM 1311 | Principles of Chemistry | 3 Units |
| CHM 1321 | Organic Chemistry I | 3 Units |
| GEO 1115 | Introduction to Earth Materials | 3 Units |
| MAT 1320 | Calculus I | 3 Units |
| MAT 1322 | Calculus II | 3 Units |
| 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 | |
| CHM 2120 | Organic Chemistry II | 3 Units |
| CHM 2123 | Laboratory of Organic Chemistry II | 3 Units |
| CHM 2128 | Synthesis and Characterization of Advanced Materials | 3 Units |
| CHM 2131 | Chemical Thermodynamics of Gases and Solutions | 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 |

| | | |
|--------------------------------|---|---------|
| CHM 3120 | Intermediate Organic Chemistry | 3 Units |
| CHM 3122 | Applications of Spectroscopy in Chemistry | 3 Units |
| CHM 3140 | Quantum Chemistry and Molecular Modelling | 3 Units |
| CHM 3350 | Transition Metal Chemistry | 3 Units |
| CHM 3373 | Molecular Spectroscopy and Statistical Mechanics | 3 Units |
| CHM 4318 | Nanostructured Materials | 3 Units |
| CHM 4354 | Principles of Instrumental Analysis | 3 Units |
| CHM 4380 | Advanced Characterization Methods in Material Science and Catalysis | 3 Units |
| CHM 4118 | Advanced Materials Laboratory | 3 Units |
| One option from the following: | | 9 Units |

Option 1: Honours Project

CHM 4010 Research Project ¹

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 3126 Laboratory of Organic Chemistry

CHM 4123 Medicinal Chemistry

CHM 4141 Computational Chemistry I

CHM 4143 Computational Chemistry II

CHM 4155 Polymer and Applied Chemistry

CHM 4182 Molecular Dynamics in Chemistry

CHM 4311 Selected Topics in Inorganic Chemistry

CHM 4313 Solid State Chemistry

CHM 4317 Organometallic Chemistry

CHM 4325 Advanced Organic Synthesis and Reaction Mechanisms

CHM 4340 Application of Theoretical Chemistry

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 ² 18 Units

Total: 120 Units

Note(s)

1

A project related to Advances Materials is strongly recommended.

2

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 |
| CHM 3126 | Laboratory of Organic Chemistry | 3 Units |
| CHM 4123 | Medicinal Chemistry | 3 Units |
| CHM 4141 | Computational Chemistry I | 3 Units |

This is a copy of the 2024-2025 catalog.

| | | |
|----------|--|---------|
| CHM 4143 | Computational Chemistry II | 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 4313 | Solid State Chemistry | 3 Units |
| CHM 4317 | Organometallic Chemistry | 3 Units |
| CHM 4325 | Advanced Organic Synthesis and Reaction Mechanisms | 3 Units |
| CHM 4340 | Application of Theoretical Chemistry | 3 Units |
| CHM 4381 | Photochemistry and Photobiology | 3 Units |
| GEO 2163 | Introduction to Mineralogy | 3 Units |
| GEO 3167 | Mineral Deposits | 3 Units |
| MAT 1341 | Introduction to Linear Algebra | 3 Units |
| PHY 2100 | Fundamentals of Applied Physics III ¹ | 3 Units |
| PHY 2323 | Electricity and Magnetism ¹ | 3 Units |
| PHY 2361 | Modern Physics | 3 Units |
| PHY 3350 | Thermodynamics | 3 Units |
| PHY 4382 | Introduction to Solid State Physics | 3 Units |
| PHY 4387 | Physics of Materials | 3 Units |

¹

No more than 3 course units from PHY 2100, PHY 2323.