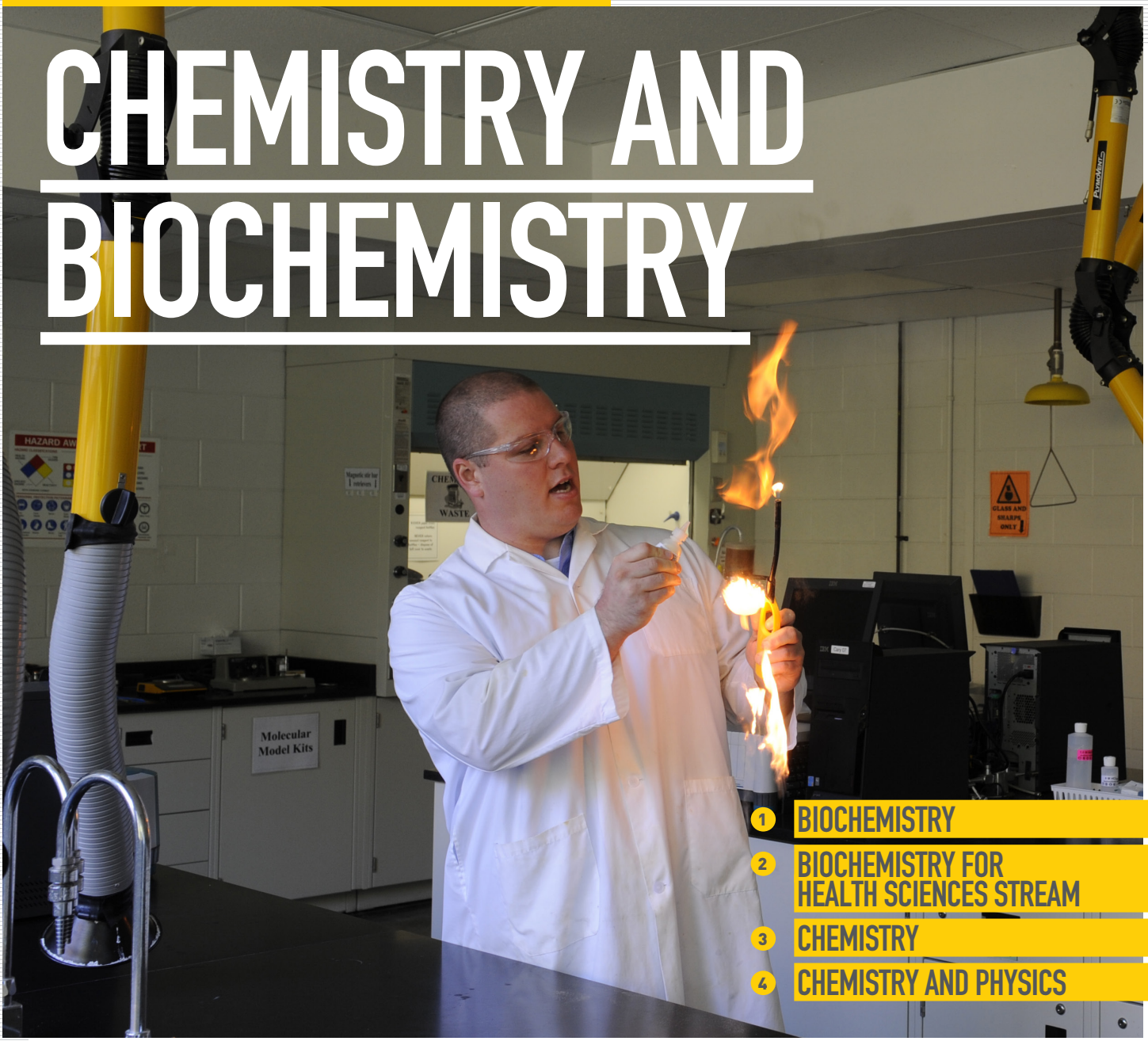
CHEMISTRY AND BIOCHEMISTRY



1. BIOCHEMISTRY
2. BIOCHEMISTRY FOR HEALTH SCIENCES STREAM
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University of Windsor

WHAT IS NEW?

Internships: Students enrolled in any our programs can now participate in work integrated learning (WIL) through paid 8 to 12 month long internships with industry partners.

Materials Chemistry: Students in the Chemistry and Biochemistry Programs can choose a Materials Stream to specialize in the chemistry of synthetic and bio-materials.

Some courses can also be taken on-line and the department also offers an On-Line Certificate in Materials Chemistry for any students who want to expand their expertise in Materials Chemistry.

Biochemistry for Health Sciences Stream: This stream within the Biochemistry Program is designed for students who want a strong background in the sciences fundamental to health and medicine and focuses on the central role of biochemistry in the health sciences.

1 BIOCHEMISTRY

Biochemistry is the study of the structure and function of biomolecules. It provides an understanding of biomolecular interactions relevant to cell biology and human diseases.

PROGRAM DESCRIPTION

This program will give you an introduction to the Chemistry program, but focuses upon the chemistry of biological systems in the senior-level years.

If you are interested in the chemistry of DNA, proteins, enzymes, as well as fundamental relationships between chemistry and living organisms, you will find this program most fascinating.

In addition, the students will have opportunities for work-integrated learning through internships at biotech and health care related industries.

To see a sample first-year schedule, visit the online Guide to Registration website (**www.uwindsor.ca/courseselection**), click on the "Science Programs" link on the left, and select the specific program(s) in which you are interested.

EXPERIENTIAL LEARNING

Experience is vital to becoming a skilled biochemist. Students in the Biochemistry program enjoy both a broad range of courses—from Pharmacology for Health Sciences, Kinetics and Photochemistry to Drug Design and DNA Science and Diagnostics—and extensive lab time. This provides the unique combination of academics and hands-on experience for which employers look.

Selected students can undertake an undergraduate fourth-year thesis in which they pursue a research project under the supervision of a faculty member. Further, NSERC undergraduate awards support summer research.

CAREER PATHS

- Graduate studies (MSc or PhD)
- Professional schools in medicine, dentistry, pharmacy, veterinary and chiropractic
- Biopharmaceutical and biotechnology industries
- University or government research laboratories
- Clinical investigations and medical research
- Education (with additional studies)

ADMISSION REQUIREMENTS

Minimum admission average of 70% (plus 70% secondary average). ENG4U, MHF4U, SCH4U and SBI4U are required. MCV4U is strongly recommended. SPH4U is recommended.

2 BIOCHEMISTRY FOR HEALTH SCIENCES STREAM

Health care is currently Canada's second-largest service industry and one of the world's fastest-growing employment sectors. The Biochemistry-Health Sciences Stream provides a clear pathway to medicine, pharmacy or graduate research in a health-related science.

PROGRAM DESCRIPTION

This program is designed to meet the needs of students who want a strong background in the sciences fundamental to health and medicine and focuses on the central role of biochemistry in the health sciences using a learning-by-doing approach.

The overall curriculum includes a greater focus on core sciences than most other health or biomedical programs, providing rigorous training that keeps career paths open and provides more options for graduate and professional schools.

The curriculum incorporates integrated laboratory components as well as opportunities for participating in original research in biochemistry related to health. In addition, the students will have opportunities for work-integrated learningthrough internships at health care related industries.

The first-year course composition of the Biochemistry Program and the Biochemistry- Health Sciences Stream are identical so that a student can choose to pursue either the Biochemistry Program or the Biochemistry – Health Sciences Stream in their second year.

To see a sample first-year schedule, visit the online Guide to Registration website (**www.uwindsor.ca/courseselection**), click on the "Science Programs" link on the left, and select the specific program(s) in which you are interested.

CAREER PATHS

- Professional programs such as medicine or pharmacy
- Industrial and academic R&D
- Health and biomedical research in graduate studies
- R&D in industry or government
- Clinical research
- Education (with additional studies) - appropriate selection of courses allows for fulfilment of teachable subjects

ADMISSION REQUIREMENTS

Minimum admission average of 70% (plus 70% secondary average). ENG4U, SCH4U, MHF4U, plus one of SPH4U or SBI4U. MCV4U is strongly recommended. SPH4U is recommended.

STUDENT SUPPORT

With the breadth of courses offered, opportunity for laboratory/research experience, and approachable professors, learning at UWindsor is a rewarding and stimulating experience.

Support for pre-professional students is available in the Departments of Biological Sciences, Chemistry and Biochemistry and the Faculty of Science, in addition to other student-based support groups such as the Science Society and the Pre-Med Society.

CONTACT US

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uwindsor.ca/chemistry

3 CHEMISTRY

Chemistry is the study of matter—anything that has mass and occupies space. Everything you can touch, hold, smell or taste involves chemistry and chemicals.

Chemists design new compounds, materials and processes to serve the needs of society: Some examples include new pharmaceuticals to fight disease, industrial catalysts for efficient manufacturing, and leading-edge nanotechnologies to change the world we live in. Chemists study the relationship between the chemical structure of matter and its properties, and predict and explain how matter changes when it reacts to form new substances.

PROGRAM DESCRIPTION

The BSc Chemistry is one of our most flexible and applied Faculty of Science programs. The Honours Chemistry program provides a strong and rigorous background in chemistry while allowing students to pursue interests in various areas of science, including biology, physics, math, earth sciences and computer science. Students can choose the Materials Stream to gain more expertise in the chemistry of synthetic and bio-materials. Some courses are also available on-line that are part of an on-line Certificate in Materials Chemistry.

Students of all chemistry programs and streams can participate in our work integrated learning option that involves a paid 8-12 month internship at industry (pharmaceutical, agricultural, chemical, etc.) and organizations (governmental, communal, health, etc.).

We offer courses and extensive laboratory experience in the general sub-disciplines of chemistry:

- Organic Chemistry
- Physical Chemistry
- Inorganic Chemistry
- Analytical Chemistry
- Materials Chemistry
- Computational Chemistry

Expertise in all these sub-disciplines is important for successful careers as diverse as research scientist, forensic scientist, environmental scientist and consultant, laboratory technician, and chemical educator. As you advance in your studies, the borders between subdisciplines will fade and interconnections between them will become more obvious and important.

To see a sample first-year schedule, visit the online Guide to Registration website (**www.uwindsor.ca/courseselection**), click on the "Science Programs" link on the left, and select the specific program(s) in which you are interested.

EXPERIENTIAL LEARNING

Experience is vital to become a skilled chemist. Our students enjoy both a broad range of courses—from Materials Chemistry, Nanoparticle Synthesis and Characterization, Main Group Chemistry, Free Radicals in Chemistry and Biology, Surface Chemistry, Pharmacology for Health Sciences, Kinetics and Photochemistry to Drug Design and Diagnostics—and extensive lab time. This provides the unique combination of academics and hands-on experience for which employers are looking.

Selected students can undertake an undergraduate fourth-year thesis in which they pursue a research project under the supervision of a faculty member. Further, NSERC undergraduate awards and Summer Research Scholarships provide paid summer research opportunities.

CAREER PATHS

Chemistry is often called the "central science" because it connects physical sciences with life sciences and engineering. Consequently, knowledge of chemistry is a requirement or beneficial for a very large number of diverse career paths of which only few are listed below. However, many require training at the MSc or PhD level.

- Entrance to professional schools such as medicine, dentistry and pharmacy
- Industrial and academic research and development
- Government and hospital laboratories
- Industrial process laboratories
- Administration and management
- Education (with additional studies)
- Environmental analyses and assessments
- Patent and environmental law (with additional studies)

ADMISSION REQUIREMENTS

Minimum admission average of 70% (plus 70% secondary average). ENG4U, MHF4U, SCH4U and SBI4U are required. MCV4U is strongly recommended. SPH4U is recommended.

4 CHEMISTRY AND PHYSICS

Honours Chemistry and Physics is a good choice if you want to attack problems of a chemical nature with a solid understanding of the underlying physics.

Physical chemistry or chemical physics leads to the development of materials such as superconductors, luminescent materials and industrial catalysts, as well as synthetic methods (e.g. pharmaceutical industry) and novel, organized structures with the potential to be utilized as "nano-machines".

PROGRAM DESCRIPTION

BSc Honours Chemistry and Physics (with and without thesis) is a good choice if you want to specialize in physical chemistry or chemical physics. This program has an enhanced focus on physical chemistry and physics. It explores the characterization of matter using various types of spectroscopy, theoretical methods, and other instrumentation such as microscopes, lasers and X-ray diffractometers. Students can take advanced courses in both physics and chemistry.

Students can choose the Materials Stream to gain more expertise in the chemistry of synthetic and bio-materials. Some courses are also available on-line that are part of an on-line Certificate in Materials Chemistry. Students can also participate in our work integrated learning option that involves a paid 8-12 month internship at industry (pharmaceutical, agricultural, chemical, etc.) and organizations (governmental, communal, health, etc.).

This program is different from a double major. Students wishing to double major in Physics and Chemistry should enrol in the Combined Honours Program.

To see a sample first-year schedule, visit the online Guide to Registration website (**www.uwindsor.ca/courseselection**), click on the "Science Programs" link on the left, and select the specific program(s) in which you are interested.

EXPERIENTIAL LEARNING

Students in the Chemistry and Physics program enjoy both a broad range of courses and extensive lab time, providing the unique combination of academics and hands-on experience for which employers look.

CAREER PATHS

- Graduate work in either area
- Industry research and development
- Academic research or teaching
- Positions in government agencies or laboratories

ADMISSION REQUIREMENTS

Minimum admission average of 70% (plus 70% secondary average). ENG4U, SCH4U, MHF4U, plus one of SPH4U or SBI4U. MCV4U is strongly recommended. SPH4U is recommended.

FINANCIAL AID

We promote undergraduate research with the unique Chemistry Research Internship Program (CRISP) scholarship for high school students who enrol in Chemistry or Chemistry & Physics programs. The internships pay a total of $3,000 over three years. CRISP students receive personalized training and are exposed to research, technologies and skills far beyond standard chemistry curricula in North America. This can strongly impact future applications for professional schools, graduate schools and employment.
For entrance and in-course award opportunities, please visit our Award Search at **my.uwindsor.ca**. Click on the Financial Matters heading and then Search for Awards in the sidebar.

In addition to entrance awards, the **Outstanding Scholars Program** attracts top high school students entering any first-year honours undergraduate program at the University of Windsor. Approximately 100 high-achieving, first-year students will be offered status as an Outstanding Scholars Candidate in Year 1 of their studies. The goal of this program is to challenge and stimulate students by providing them with the unique opportunity of holding an undergraduate academic appointment in their second year of studies and beyond where students will work closely with faculty on academic research projects.

For more information, please visit: **uwindsor.ca/outstandingscholars**

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