

# Bachelor of Science

## Chemical Physics



### ABOUT THE PROGRAM

Chemical Physics examines the atomic and molecular nature of chemical and physical processes. It combines the theoretical approach with the molecular focus of chemistry. Chemical Physics emphasizes laboratory work and recognizes the links between many areas of Chemistry and Physics, such as the use of X-ray diffraction to determine molecular structure. You will study organic, inorganic and biological chemistry and fundamental interactions at the atomic level. You will also study the use of physical techniques such as spectroscopy, X-ray, nuclear scattering and microscopy to examine the identity and structure of chemical compounds. Overall, the Chemical Physics major provides a broader background than a major in either Physics or Chemistry and opens the door to a wide variety of possible careers.

### WHY CO-OP?

As a co-op student, you will gain relevant work experience, build professional networks, and develop essential interpersonal skills needed to succeed in the workplace; all while being paid and earning your university degree. Guelph's co-op program is unique due to the exceptional level of support provided, including an online preparatory course, a personal connection with a Co-op Co-ordinator to assist you during the employment process, and access to senior student mentors.

### COURSE SEQUENCING

In the Chemical Physics co-op program, you will participate in five co-op work terms in addition to eight academic semesters throughout your five years at the University of Guelph. This sequencing is viewable below:

YEAR	FALL	WINTER	SUMMER
ONE	Academic	Academic	Off
TWO	Academic	Academic	Work
THREE	Work	Academic	Work
FOUR	Academic	Work	Work
FIVE	Academic	Academic	



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## SAMPLE JOBS

There is a diverse selection of jobs made available to Chemical Physics co-op students, in the academic, government, and private sectors within various industries. Students may conduct research, assist with product development or quality assurance, and may work in a laboratory, in the field, and/or in an office setting. Below are some examples of past positions held by Chemical Physics co-op students:

### Research Assistant

The student will be involved in the preparation and/or characterization of molecular materials using crystallography, thermal analysis and spectroscopic techniques; deconvolution analysis of thermal analysis and X-ray diffraction patterns to determine the molecular composition from experimental data.

### Lab Technician

The student will analyze customer samples of all types of plating solutions within the analytical lab and make recommendations to maintain good and consistent results. Testing/instrumentation that will be utilized include pH meters, titration, surface tension, UV/Spectrophotometers, ion chromatography, liquid chromatography, atomic absorption, and inductively coupled plasma – optical emission spectroscopy.

### Horticulture Assistant

In this role, students collect samples of Ontario grown fruits and vegetables as well as Ontario produced honey from farmers markets, roadside stands and retail locations from across the province. Students will gather information on the sample and the producer and complete all appropriate paperwork. The samples will be analyzed for microbial, chemical and heavy metal contaminants to determine compliance with regulatory requirements.

**Additional Sample Jobs:** Research and Development Intern, Assistant Technical Analyst, Finishing Quality Control Co-op Student, Quality Assurance Lab Technician, and more.

## SAMPLE EMPLOYERS\*

- McNeil Consumer Healthcare
- University of Guelph - Department of Physics, Department of Chemistry
- Environment Canada
- Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA)

\*This shows a sample of recent co-op employers, and employers will vary depending on employer recruitment needs. During a job search, students are encouraged to be actively engaged and are also supported in establishing and maintaining their own personal contacts.

## SALARY INFORMATION Average Weekly Salary Range: \$595 - \$605\*

\*Salary ranges are shown as rates before deductions. Statistics are based on jobs held by co-op students in 2016. These ranges may fluctuate on an annual basis in response to economic conditions.

## ABILITIES & KNOWLEDGE ACQUIRED

- Fundamental knowledge of basic physics, chemistry, and math
- A solid foundation in circuit theory, wave theory and optics as well as analytical, physical and/or organic chemistry
- Strong scientific programming and desktop computing proficiency
- Exceptional laboratory and report-writing expertise
- Excellent communication, teamwork, and problem-solving skills