PHYSICS AND CHEMISTRY HONOURS (B.SC.) (80 CREDITS)

Offered by: Physics (Faculty of Science)
Degree: Bachelor of Science
Program credit weight: 80

Program Description

This program provides a strong basis in both chemistry and physics. It contains a core of chemistry courses and a mix of honours-level courses in physics and mathematics.

To graduate with an Honours degree, a student must have, at time of graduation, a CGPA of at least 3.0 in the required and complementary courses of the program, as well as an overall CGPA of at least 3.0.

This is a specialized and demanding program. The student will have two advisers, one from Chemistry and the other from Physics. This program may be completed in 80 or 83 credits.

Degree Requirements — B.Sc.

This program is offered as part of a Bachelor of Science (B.Sc.) degree.

To graduate, students must satisfy both their program requirements and their degree requirements.

- The program requirements (i.e., the specific courses that make up this program) are listed under the Course Tab (above).
- The degree requirements—including the mandatory Foundation program, appropriate degree structure, and any additional components—are outlined on the Degree Requirements page.

Students are responsible for ensuring that this program fits within the overall structure of their degree and that all degree requirements are met. Consult the Degree Planning Guide on the SOUSA website for additional guidance.

Note: For information about Fall 2025 and Winter 2026 course offerings, please refer to Visual Schedule Builder. A technical issue is causing the "Terms offered" field to incorrectly report "this course is not currently offered" for many courses in the Course Catalogue.

Program Prerequisites

Students entering Physics programs from the Freshman program must have successfully completed the courses below or their equivalents. Quebec students must have completed the DEC with appropriate science and mathematics courses.

Expand allContract all

Course	Title	Credits
CHEM 110	General Chemistry 1.	4
CHEM 120	General Chemistry 2.	4
PHYS 131	Mechanics and Waves.	4
PHYS 142	Electromagnetism and Optics.	4

3 credits from:

Expand allContract all

Course	Title	Credits
BIOL 111	Principles: Organismal Biology.	3
BIOL 112	Cell and Molecular Biology.	3
MATH 133	Linear Algebra and Geometry.	3

7-8 credits from:

Expand allContract all

Course	Title	Credits
MATH 140	Calculus 1.	3
MATH 141	Calculus 2.	4
MATH 150	Calculus A.	4
MATH 151	Calculus B.	4

Note: Either MATH 140 Calculus 1. and MATH 141 Calculus 2. or MATH 150 Calculus A. and MATH 151 Calculus B..

Required Courses (68 credits)

Expand allContract all

Course	Title	Credits
CHEM 212	Introductory Organic Chemistry 1.	4
CHEM 213	Introductory Physical Chemistry 1: Thermodynamics.	3
CHEM 273	Introductory Physical Chemistry 2: Kinetics and Methods.	3
CHEM 281	Inorganic Chemistry 1.	3
CHEM 355	Applications of Quantum Chemistry.	3
CHEM 365	Statistical Thermodynamics.	2
CHEM 493	Advanced Physical Chemistry Laboratory.	2
CHEM 556	Advanced Quantum Mechanics.	3
CHEM 574	Introductory Polymer Chemistry.	3
COMP 208	Computer Programming for Physical Sciences and Engineering .	3
MATH 247	Honours Applied Linear Algebra.	3
MATH 248	Honours Vector Calculus.	3
MATH 249	Honours Complex Variables.	3
MATH 325	Honours Ordinary Differential Equations.	3
PHYS 241	Signal Processing.	3
PHYS 251	Honours Classical Mechanics 1.	3
PHYS 257	Experimental Methods 1.	3
PHYS 258	Experimental Methods 2.	3
PHYS 350	Honours Electricity and Magnetism.	3
PHYS 352	Honours Electromagnetic Waves.	3
PHYS 357	Honours Quantum Physics 1.	3
PHYS 457	Honours Quantum Physics 2.	3
PHYS 558	Solid State Physics.	3

Complementary Courses (12-15 credits)

(with at least 3 credits in Chemistry and 3 credits in Physics)

0-3 credits from:

Expand allContract all

Course	Title	Credits
MATH 222	Calculus 3.[1]	3

[1] Note: A student who has not taken MATH 222 Calculus 3. (or equivalent) prior to entering the program must take it in their first semester, increasing the program credits from 80 to 83. The student must then take MATH 314 Advanced Calculus. in their second semester instead of MATH 248 Honours Vector Calculus., if scheduling requires it.

3 credits selected from:

Expand allContract all

Course	Title	Credits
CHEM 593	Statistical Mechanics and Machine Learning for Chemistry.	3
PHYS 559	Advanced Statistical Mechanics.	3

9 credits selected from the list below:

Note: PHYS 459D1 Research Thesis. and PHYS 459D2 Research Thesis. are taken together.

Expand allContract all

Course	Title	Credits
CHEM 480D1	Undergraduate Research Project 2.	1.5
CHEM 480D2	Undergraduate Research Project 2.	1.5
CHEM 505	Computer Modeling of Molecules and Materials.	3
CHEM 531	Chemistry of Inorganic Materials.	3
CHEM 575	Chemical Kinetics.	3
CHEM 585	Colloid Chemistry.	3
PHYS 351	Honours Classical Mechanics 2.	3
PHYS 359	Advanced Physics Laboratory 1.	3
PHYS 404	Climate Physics.	3
PHYS 434	Optics.	3
PHYS 459D1	Research Thesis.	3
PHYS 459D2	Research Thesis.	3
PHYS 469	Advanced Physics Laboratory 2.	3
PHYS 479	Physics Research Project.	3
PHYS 512	Computational Physics with Applications.	3
PHYS 562	Electromagnetic Theory.	3