MATHEMATICS AND PHYSICS HONOURS (B.SC.) (81 CREDITS)

Offered by: Physics (Faculty of Science)
Degree: Bachelor of Science
Program credit weight: 81

Program Description

This is a specialized and demanding program intended for students who wish to develop a strong basis in both Mathematics and Physics in preparation for graduate work and a professional or academic career. Although the program is optimized for theoretical physics, it is broad enough and strong enough to prepare students for further study in either experimental physics or mathematics.

The minimum requirement for entry into the program is completion with high standing of the usual CEGEP courses in physics and in mathematics, or the Physics Program Prerequisites as explained below. In addition, a student who has not completed the equivalent of MATH 222 Calculus 3. must take it in the first term without receiving credit toward the 81 credits required in the Honours program.

A student whose average in the required and complementary courses in any year falls below a GPA of 3.00, or whose grade in any individual required or complementary course falls below a C (unless the student improves the grade to a C or higher through a supplemental exam or by retaking the course), may not register in the Honours program the following year, or graduate with the Honours degree, except with the permission of both departments. The student will have two advisers, one from Mathematics and the other from Physics.

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 check back on May 8, 2025. Until then, the "Terms offered" field will appear blank for most courses while the class schedule is being finalized.

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

One of:

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. and either MATH 140 Calculus 1./MATH 141 Calculus 2. or MATH 150 Calculus A./MATH 151 Calculus B..

Expand allContract all

Course	Title	Credits
MATH 133	Linear Algebra and Geometry.	3
MATH 140	Calculus 1.	3
MATH 141	Calculus 2.	4
MATH 150	Calculus A.	4
MATH 151	Calculus B.	4

U1 Required Courses (27 credits)

Expand allContract all

Course	Title	Credits
MATH 235	Algebra 1.	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 260	Modern Physics and Relativity.	3

U2 Required Courses (24 credits)

Expand allContract all

Course	Title	Credits
MATH 255	Honours Analysis 2.	3
MATH 475	Honours Partial Differential Equations.	3
PHYS 253	Thermal Physics.	3
PHYS 350	Honours Electricity and Magnetism.	3
PHYS 351	Honours Classical Mechanics 2.	3
PHYS 357	Honours Quantum Physics 1.	3

PHYS 362	Statistical Mechanics.	3
PHYS 457	Honours Quantum Physics 2.	3

U3 Required Courses (12 credits)

Expand allContract all

Course	Title	Credits
MATH 454	Honours Analysis 3.	3
MATH 458	Honours Differential Geometry.	3
PHYS 352	Honours Electromagnetic Waves.	3
PHYS 359	Advanced Physics Laboratory 1.	3

Complementary Courses (18 credits)

U1 Complementary Course (3 credits)

Expand allContract all

Course	Title	Credits
MATH 247	Honours Applied Linear Algebra.	3
MATH 251	Honours Algebra 2.	3

U2 Complementary Courses (3 credits)

Expand allContract all

Course	Title	Credits
MATH 242	Analysis 1.	3
MATH 254	Honours Analysis 1.[1]	3

[1] It is strongly recommended that students take MATH 254 Honours Analysis 1..

U3 Complementary Courses (12 credits)

12 credits are selected as follows:

3 credits from:

Expand allContract all

Course	Title	Credits
MATH 455	Honours Analysis 4.	3
MATH 456	Honours Algebra 3.	3

6 credits selected from:

Expand allContract all

Course	Title	Credits
PHYS 404	Climate Physics.	3
PHYS 432	Physics of Fluids.	3
PHYS 459D1	Research Thesis.[1]	3
PHYS 459D2	Research Thesis.[1]	3
PHYS 479	Physics Research Project.	3
PHYS 512	Computational Physics with Applications.	3
PHYS 514	General Relativity.	3
PHYS 519	Advanced Biophysics.	3
PHYS 521	Astrophysics.	3
PHYS 551	Quantum Theory.	3
PHYS 557	Nuclear Physics.	3
PHYS 558	Solid State Physics.	3
PHYS 559	Advanced Statistical Mechanics.	3
PHYS 562	Electromagnetic Theory.	3
PHYS 567	Particle Physics.	3

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

3 credits in Honours Mathematics.