HONOURS BSC IN PHYSICS-MATHEMATICS

Why is our world the way it is? How can we understand and explain what we observe around us, from the smallest sub-atomic particles to the largest galaxies? How can we apply this understanding to manipulate our world? Studying physics gives insight into the fundamental laws of nature.

But an education in physics gives so much more. The rigorous training our students receive in analyzing and understanding complex problems is valuable in many future careers. While many of our graduates have established careers in universities and in the high tech sector as research and development scientists, others have used their physics degrees as a springboard to careers in finance, administration, medicine, management or education. The range of career opportunities is perhaps wider than for any other students with a science education.

Physicists have revolutionized the way we live our lives, with groundbreaking discoveries and new technologies, transferable to other fields such as biology or finance. Our professors and graduates are an important part of this chain. Many of our professors have also been recognized for their teaching and are seen as world-class researchers in their fields of expertise.

The research conducted by the professors in the Department of Physics is concentrated in several sub-specialties, including the physics of biological and complex systems, condensed matter physics, photonics and the physics of geomatials. Depending upon your choice of program, you have the opportunity to take courses and participate in research projects in these specialized areas.

In addition to the Honours BSc in Physics, we offer three other Honours BSc programs. The first is in physics-mathematics, which provides enriched mathematics training within a physics program. The second is the option in photonics, which gives students a solid training in physics and a more applied and industry-related training in photonics. The third is the option in biological physics, which teaches students to apply a rigorous education in physics to various areas of life sciences. We also offer a Major in Physics that can form the core of an Honours BSc when combined with a major or a minor in another discipline in the Faculty of Science, or in another faculty. Finally, starting in fall 2016, we will offer a five-year integrated program in physics (BSc) and electrical engineering (BASc), jointly with the School of Electrical Engineering and Computer Science (SEECS). This unique program will offer a full education in physics and electrical engineering. Graduates will be sought after by industry and academia, as they will have the capacity to develop technology from a basic physics idea to the final product.

The Department of Physics also has strong graduate programs, leading to an MSc or PhD. They give students the opportunity to work on cutting edge science in a research group led by one or more department professors.

This program is offered in English and in French.

Program Requirements
Co-operative education is available with this program.

The extended French stream is available with this program.

Requirements for this program have been modified. Please consult the 2015-2016 calendars (http://www.uottawa.ca/academic/info/regist/1516/calendars) for the previous requirements.

MAT 1320  Calculus I  3 Units
MAT 1322  Calculus II  3 Units
MAT 1341  Introduction to Linear Algebra  3 Units
PHY 1121  Fundamentals of Physics I  3 Units
PHY 1122  Fundamentals of Physics II  3 Units
3 course units from:¹ 3 Units
  GNG 1106  Fundamentals of Engineering Computation  3 Units
  ITI 1120  Introduction to Computing I  3 Units
3 course units from:
  MAT 1348  Discrete Mathematics for Computing² 3 Units
  MAT 1362  Mathematical Reasoning and Proofs  3 Units
MAT 2122  Multivariable Calculus  3 Units
MAT 2125  Elementary Real Analysis  3 Units
MAT 2141  Linear Algebra I  3 Units
MAT 2143  Algebraic Structures  3 Units
PHY 2104  Introduction to Circuit Theory and Electronics  3 Units
PHY 2311  Waves and Optics  3 Units
PHY 2323  Electricity and Magnetism  3 Units
PHY 2333  Mechanics  3 Units
PHY 2361  Modern Physics  3 Units
3 course units from:
  MAT 2324  Ordinary Differential Equations and the Laplace Transform  3 Units
  MAT 2384  Ordinary Differential Equations and Numerical Methods  3 Units
3 course units from:
  MAT 2371  Introduction to Probability  3 Units
  MAT 2377  Probability and Statistics for Engineers  3 Units
PHY 3320  Electromagnetic Theory  3 Units
PHY 3341  Theoretical Physics  3 Units
PHY 3350  Thermodynamics  3 Units
PHY 3355  Statistical Thermodynamics  3 Units
PHY 3370  Introductory Quantum Mechanics  3 Units
PHY 3902  Physics and Applied Physics Laboratory I  3 Units
PHY 4370  Quantum Mechanics  3 Units
3 course units from:
  PHY 4382  Introduction to Solid State Physics  3 Units
  PHY 4906  Physics Project  3 Units
6 optional course units in physics (PHY) at the 4000 or 5000 level  6 Units
6 optional course units in mathematics (MAT) at the 3000 or 4000 level, excluding MAT 3320 ³  6 Units
12 elective course units from 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 ⁴  18 Units
Total:  120 Units

¹ Please see the Mathematics Calculus and Linear Algebra sections in the Mathematics table.
² This course cannot be taken for credit by students who have completed MAT 1322.
³ Students must take at least 6 units from the above list.
⁴ Students must take at least 6 units from the above list.

Note(s)

1. ITI 1120 is a prerequisite for most further computer science courses (CSI). GNG 1106 is recommended for students not taking further computer science courses (CSI).

2. MAT 1348 is a prerequisite for most second year computer science courses (CSI).

3. The following courses are recommended as particularly useful: MAT 3130, MAT 3155, MAT 3341, MAT 3380, MAT 3395, MAT 4183, MAT 4387.

4. Out of the 18 elective course units, some breadth in other sciences is recommended, particularly CHM 1311.

This message is intended for students registered in the Faculty of Science. If the components of your program of study require common compulsory courses, you will have to replace the units as follows:

1. 1000-level courses must be replaced with elective course units;
2. 2000-level courses and above must be replaced with optional course units from either discipline at the same level or above.

Please note that all programs in the Faculty of Science require a minimum of 12 elective course units from the Faculty of Arts, the Faculty of Education, the Faculty of Law, the Faculty of Social Sciences or the Telfer School of Management. Once you have decided on the replacement courses, please inform the Office of Undergraduate Programs of the Faculty of Science by email at infosci@uOttawa.ca so that we may amend your Academic Advisement accordingly.