HONOURS BSC PHYSICS - BIOLOGICAL PHYSICS OPTION

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 geomaterials. 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 French immersion stream is available with this program.

Requirements for this program have been modified. Please consult the 2022-2023 calendars (http://catalogue.uottawa.ca/en/archives/) for the previous requirements.

Compulsory Courses at the 1000 level
BIO 1140  Introduction to Cell and Molecular Biology  3 Units
CHM 1311  Principles of Chemistry  3 Units
MAT 1320  Calculus I  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

Compulsory Courses at the 2000 level
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 2325  Physics in Biology  3 Units
PHY 2333  Mechanics  3 Units
PHY 2361  Modern Physics  3 Units

Compulsory Courses at the 3000 level
BIO 3153  Cell Biology  3 Units
PHY 3320  Electromagnetic Theory  3 Units
PHY 3325  Introduction to Molecular Biophysics  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 3904  Physics and Applied Physics Laboratory II  3 Units

Compulsory Courses at the 4000 level
PHY 4322  Biological Physics  3 Units

Optional Courses
3 course units from:
MAT 1322  Calculus II  3 Units
MAT 1325  Calculus II and an Introduction to Analysis  3 Units
MAT 2122  Multivariable Calculus  3 Units
MAT 2322  Calculus III for Engineers  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

One option from the following:  6 Units
Option 1:
PHY 4006  Physics Research Project

Option 2:
PHY 4903  Physics Laboratory
PHY 4906  Physics Project

3 optional course units in mathematics (MAT) at the 2000, 3000 or 4000 level, excluding MAT 2379  3 Units
6 optional course units in biology (BIO) at the 2000, 3000 or 4000 level  6 Units

Elective Courses

This is a copy of the 2024-2025 catalog.
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<tr>
<th>Course Units</th>
<th>Units</th>
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<tbody>
<tr>
<td>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</td>
<td>12 Units</td>
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<tr>
<td>18 elective course units</td>
<td>18 Units</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>120 Units</strong></td>
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Note(s)

1. (MAT 2141 or MAT 2342) or (MAT 2371 or MAT 2377) is recommended.

2. Of the 18 elective course units, some breadth in other sciences is recommended. In particular, the following courses are recommended: CHM 1321, PHY 1112.