

# Biophysics

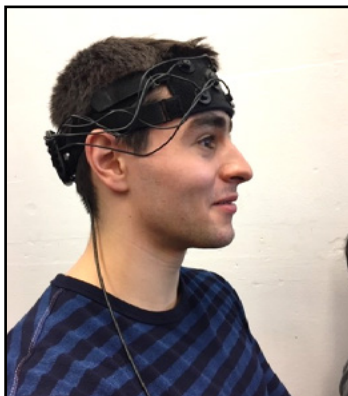
BSc | [www.yorku.ca/science/biophysics](http://www.yorku.ca/science/biophysics)

## Admission Requirements

- ENG4U, MHF4U, SBI4U, SPH4U, MCV4U
- **Recommended:** SCH4U
- **Minimum admission average:** low 80s – mid 80s

## Program Overview

Biophysics is a transdisciplinary frontier of science in which the principles and techniques of physics are applied to study living things and how they work. York's program in Biophysics is a four-year specialized honours degree which spans fundamental physics and its application in medicine, aging and disease, biophotonics, vision and biosensory physics, and neurophysics. York University is **one of only a few institutions which offers a comprehensive four-year undergraduate degree program in biophysics**. You will be taking a combination of lecture-based and laboratory-based courses, providing you with both theoretical knowledge and practical experience.



*4th-year student in Biophysical Techniques course wearing a functional biophotonic cap which measures near-infrared absorption by hemoglobin to probe cerebral blood oxygenation changes.*

You will learn to bridge physics and biology to gain a deep understanding of the complexities of life. This interdisciplinary approach opens up many potential future avenues in medicine, research, industry, etc. To achieve this, you will learn to recognize biological and physical problems and potential interdisciplinary solutions. You will also develop your skills in problem-solving, critical thinking, mathematics, and computing, and enhance your ability to think laterally.

In addition, you may have opportunities to acquire work experience conducting research in a for-credit individual research course with a York professor or through student summer research through the Natural Sciences and Engineering Research Council of Canada's summer program. York's Biophysics program offers many research opportunities through its association with the world-class Centre for Vision Research and the Vision: Science to Applications research initiatives at York.

## First Year Courses:

- Physics
- Biology
- Calculus and Linear Algebra
- Computer Programming (Python)
- Non-science electives

## Second Year Courses:

- Current Topics in Biophysics
- Chemistry
- Genetics
- Classical Mechanics
- Electromagnetism
- Optics and Spectra
- Experimental Physics
- Multivariate & Vector Calculus
- Differential Equations

## Upper Year Options:

- Photosynthesis
- Cell Biology
- Proteomics
- Microbiology
- Organic Chemistry
- Biochemistry
- Modern Physics
- Molecular Biology
- Membrane Transport
- Quantum Mechanics
- Cellular Electrodynamics
- Biophysical Techniques
- Statistical & Thermal Physics
- Techniques in Laser Physics
- Experimental Methods & Data Analysis
- Atomic & Molecular Physics

**Biophysics (BSc) | [www.yorku.ca/science/biophysics](http://www.yorku.ca/science/biophysics)**

**Experiential Education**

The Faculty of Science provides a rich diversity of opportunities for undergraduate students to engage in Experiential Education. The Internship Program provides students in this program with the opportunity to integrate their classroom learning with hands-on, paid, work experiences related to their field of study. Internship students will begin their work term(s) after their third year of classroom study and can take part in 4, 8, 12, or 16 months of work before returning to school to complete their studies.

Here are just a few of the companies and agencies you could have the opportunity to work for:

- Canadian Space Agency
- Sanofi Pasteur
- Canberra Packard
- HealthGene Corporation
- Parks Canada
- City of Toronto
- BioTalent Canada
- TRIUMF, Canada’s particle accelerator centre

Visit [yorku.ca/science/students/experiential-education/](http://yorku.ca/science/students/experiential-education/) for more information.

**Possible Career Pathways**

Your studies in Biophysics at York will prepare you for a very diverse range of career options:

- |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <ul style="list-style-type: none"> <li>• Medical Science</li> <li>• Forensic Science</li> <li>• Radiation Science</li> <li>• Biotechnology</li> <li>• Environmental Science</li> <li>• Agricultural Science</li> <li>• Computational Biology</li> <li>• Epidemiological Modeling</li> <li>• Applied Health Sciences</li> <li>• Biophotonics</li> </ul> | <ul style="list-style-type: none"> <li>• Neurophysics</li> <li>• Professional Schools – Medicine, Dentistry, Optometry, Pharmacy, etc.</li> <li>• Education – elementary, high school, college, university</li> <li>• Postgraduate Studies/Academic Career</li> <li>• Health Sciences – nurse, chiropractist, biomedical technician, genetic counsellor, diagnostic histologist, etc.</li> <li>• Postgraduate Studies/Academic Career</li> </ul> |
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**Get In Touch**

**Domestic Students:**  
science@yorku.ca

**International Students:**  
intlsci@yorku.ca

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“The Biophysics program at YorkU is a very unique one. I get a nice taste of all science courses while having the opportunity to focus on the courses I love. It is an integrative area of study that encourages critical thinking and creative problem solving skills using the perspective of more than one science. I’m passionate about exploring and studying the biology of humans as we begin our journey to space. I’m nurturing this interest by learning more about cell and animal biology in addition to immunology, while studying the physics of space travel. ”

**- Zena, Biophysics Student**