



Admission Requirements

Biophysics (BSc)

Prerequisite Requirements for BSc:

- ENG4U, SBI4U, SPH4U, MHF4U, MCV4U
- Recommended: SCH4U

Expected minimum admission average:

low-to-mid 80s

<p>If you major in Biophysics your courses in first year will probably be:</p> <ul style="list-style-type: none"> • Physics • Chemistry • Biology • Calculus • Computer Use • General Education Course 	<p>In second year you will probably take:</p> <ul style="list-style-type: none"> • Current Topics in Biophysics • Genetics • Classical Mechanics • Electromagnetism • Optics and Spectra • Experimental Physics • Multivariate & Vector Calculus • Differential Equations
<p>Career options for Biophysics majors include:</p> <ul style="list-style-type: none"> • Medical Science • Forensic Science • Radiation Science • Biotechnology • Environmental Science • Agricultural Science • Computational Biology • Applied Health Sciences • Professional Schools – Medicine, Dentistry, Optometry, Pharmacy, etc. • Education – elementary, high school, college, university • Postgraduate Studies/Academic Career 	<p>Courses you might take in upper years include:</p> <ul style="list-style-type: none"> • Biophysics • Statistical & Thermal Physics • Modern Physics • Experimental Techniques in Laser Physics • Cell Biology • Electromagnetics • Microsystems Technology • Macromolecules for Biochemistry • Organic Chemistry • Experiments in Modern Physics • Quantum Mechanics • Atomic & Molecular Physics • Advanced Biochemistry • Molecular Biology • Microbiology • Cellular Regulation • Membrane Transport • Photosynthesis

Why study Biophysics at York University?

Biophysics is an interdisciplinary frontier of science in which the principles and techniques of physics are applied to study living things and how they work. At a macroscopic level, biophysicists are exploring how organisms develop and how they see, hear, taste, feel, and think. Also, they are examining activities such as movement, breathing, muscle contractions, and the operation of bones. Research along these avenues can have significant technological spinoffs, such as the development of better robots. At a microscopic level, biophysicists are studying how cells move and divide, how they harness and process energy, and how they react to external stimuli. Particularly interesting subjects include how a muscle cell converts the chemical energy of ATP into movement, how DNA is replicated during cell division, and whether the shapes of nucleotides define a "second genetic code". Spinoffs include the development of nanotechnology founded upon the unique mechanical and electrical properties of DNA. To facilitate their explorations, biophysicists are at the cutting edge of research aimed at developing new or improved techniques of imaging, diagnosis, and analysis.

York University is one of only a few institutions which offers a comprehensive four-year undergraduate degree program in biophysics. This program is special because it is strong in both physics and biology, focused by courses dedicated to biophysics, and sufficiently broad in scope to expose you to knowledge and techniques applicable not only to humans but to all of the kingdoms of life. In the end, you will learn to recognize biological problems which could benefit from physical insights as well as physical principles which might productively confront biological challenges.

Program Overview

York's program in Biophysics is a four-year specialized honours degree. You will be taking a combination of lecture-based and laboratory-based courses, providing you with both theoretical knowledge and practical experience. In your four years at York, you will gain theoretical knowledge and understanding of the fields of biophysics, biology, and physics. 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 student summer research through the Natural Sciences and Engineering Research Council of Canada's (NSERC) summer program.

Technology Internship Program

Qualified Biophysics students have the opportunity to participate in the innovative Technology Internship Program, which provides paid work experience. These internships take place between third and fourth year and range from four to sixteen months. Unlike a 4-month co-op placement, the internship is designed to allow you to participate in more significant projects in the workplace. Assistance is provided in placing students in internships after the completion of third year. York's internships provide valuable professional experience, enabling our graduates to move more easily into exciting Biophysics careers. Here are just a few of the companies you could have the opportunity to work for:

- Sanofi Pasteur
- Health Gene Corporation
- Parks Canada
- City of Toronto
- Grande Prairie Regional College

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



science



Facilities and Opportunities at York University and Beyond

An undergraduate degree in Biophysics from York will prepare you for employment in a wide variety of areas, or if you so choose, for further studies at the graduate level, in medicine, or in applied health sciences. Fields in which there is demand for biophysical talent include radiation science, biotechnology, forensic science, environmental science, medical science, optometry, agricultural science, and computational biology. Biophysicists are employed in industry, government, universities, and public and private research institutes, including medical centers.

Your future career will depend upon your interests. If the field of radiation intrigues you, career paths range from agricultural science to medical science. An example of the use of radiation in agriculture is the destruction of harmful bacteria in food. On the medical side, radiation in the form of light (X-rays, gamma-rays, etc.) and particles (electrons, positrons, protons, neutrons) is used to treat tumors. Of course, radiation in various forms is behind modern diagnostic imaging techniques, such as Computer Aided Tomography (CAT), Magnetic Resonance Imaging (MRI), and Positron Emission Tomography (PET).

If you want a deeper understanding of the way life works without being constrained by disciplinary borders, biophysics may be for you. York is the perfect starting place for your biophysics future.