BIOPHYSICS (HBSc)
Department of Chemical & Physical Sciences

Biophysics combines fundamental courses in physics, mathematics, chemistry, and biology together with specialized courses in biological physics. This new program has been introduced in response to the growing demand for specialists with physics background in the areas of biology and medicine. Are you interested in understanding how the building blocks of biology, such as proteins, DNA and RNA, fit together and interact to form the living world around us? Maybe you would like to build an instrument that can rapidly identify blood-borne infections or diagnose and track the progression of Alzheimer’s disease. Perhaps you’re interested in programming a computer to figure out the ideal way for a drug to target and attack a cancer cell. These are some of the challenges that Biophysicists tackle every day.

MAKE THE MOST OF YOUR TIME AT UTM!

We want to help you maximize your university experience, so we’ve pulled together information and interesting suggestions to get you started, although there are many more! As you review the chart on the inside pages, note that many of the suggestions need not be restricted to the year they are mentioned. In fact, activities such as joining an academic society, engaging with faculty and seeking opportunities to gain experience should occur in each year of your study at UTM. Read through the chart and create your own plan using My Program Plan found at www.utm.utoronto.ca/program-plans

Programs of Study (POSt)

- Specialist Program ERSPE1944 Biophysics Specialist (Science)
- Major Program ERMAJ1944 Physics (Science)
- Minor Program ERMIN1944 Physics (Science)

Check out...

Get a physicist’s perspective on the building blocks of the living world in PHY332H5. You’ll learn about a wide range of biophysical techniques commonly used in life science.

What can I do with my degree?

The career you choose will depend on your experience and interests. Visit the Career Centre to explore your career options.

Careers for Graduates: Medical physicist; Ultrasound technician; Radiation therapist; Photodynamic therapist; Nuclear medicine technologist; Biological technician; Pharmacologist; Informationist; Community health worker; Doctor

Workplaces: Government; Research Laboratories; Manufacturing; Research centres; Hospitals and medical centres; Pharmaceuticals; Biotechnology; Academic medical centres/laboratories.
**BIOPHYSICS SPECIALIST Program Plan**

**1ST YEAR**
- Enroll in courses (PHY146H5 and PHY147H5) or (PHY136H5 and PHY137H5), BIO152H5, CHM110H5 and CHM115H5, (MAT135H5 or MAT136H5) and (MAT132H5 or MAT137H5) and (MAT152H5 or MAT153H5 or MAT157H5 or ISP100H5).
- Choose a program of study (Subject POS) once you complete 4.0 credits. Use the Degree Explorer and the Academic Calendar to plan your degree.
- Develop foundational academic skills and strategies by enrolling in a uTOMe course. Build community and gain academic support through LAUNCH. Join a RGASC Peer Facilitated Study Group.

**2ND YEAR**
- Enroll in courses PHY241H5 and PHY245H5 and PHY255H5; JCP221H5 and JCP265H5; MAT232H5 and MAT233H5 and MAT244H5; BIO206H5.
- Consider applying for Research Opportunity Program (ROP) courses PHY299Y and PHY399Y and work in a research lab. Visit the EEU website for ROP Course Prerequisites. Attend the RGASC's PART to enhance your research skills.
- Use the Career & Co-Curricular Learning Network (CLNx) to find postings for on- and off-campus work and volunteer opportunities.
- Work on-campus through the Work-Student Program. View position descriptions on the CLNx.

**PLAN YOUR ACADEMICS**

**BUILD SKILLS**
- Networking simply means talking to people and developing relationships with them. Start by joining the UTM Physics Club. Go to the Ennoble Chemical & Physical Sciences Society's Meet the Pros Night.
- Visit the UTM Library Reference Desk.
- Engage with the many programs offered by the International Education Centre (IEC), whether you are an international or domestic student. Consider joining the Canada Eh? day trips or English Language Conversation Circles to deepen your global mindset.
- First-year international students can also take advantage of THRIVE', a one-day conference dedicated to helping you start your UTM journey successfully.
- Participate in International Education Week and engage in programs like Global and Intercultural Fluency Training Series (GIFTS) to build on your leadership and communication skills in global citizenship. Learn about and prepare for a future UTM Abroad Experience through the IEC to strengthen and enhance your intercultural skill set, and learn about other cultures while sharing your own!

**BUILD NETWORK**
- Attend the Program Selection & Career Options workshop offered by the Office of the Registrar and the Career Centre (CC).
- Check out Careers by Major at the CC to see potential career options.
- Explore careers through the CC's Job Shadow Program.
- Considering further education? Attend the CC's Graduate & Professional Schools Fair. Talk to professors - they are potential mentors and references.

**PLAN FOR YOUR FUTURE**
- Engage in programs like ISTEP and THRIVE to support your transition out of the University!
- What's your next step after undergrad?
- Expanding your intercultural awareness and developing intercultural skills will help you in your academics, personal growth and are highly sought out by employers.
- Earning credits overseas? Apply to study for a summer term, or year at one of 170+ universities. Speak to the IEC for details about Course Based Exchange, funding and travel safety. Attend Global Learning Week to learn about the various opportunities available to you!
- Market your skills to employers. Get your resume critiqued at the CC. Attend the CC workshop Now That I'm Graduating What's Next?
- Write a strong application for further education. Attend the CC's Mastering the Personal Statement workshop.

**3RD YEAR**
- Enroll in courses PHY324H5 and PHY326H5 and PHY338H5 and PHY347H5, JCP321H5 and JCP322H5, BIO314H5 or PHY325H5.
- Throughout your undergraduate degree:
  - use the Degree Explorer to ensure you complete your degree and program requirements
  - see the CPS Academic Counsellor and the Office of the Registrar for assistance.
- Apply to TRIUMF - Canada's national laboratory for particle and nuclear physics - that accepts 70 undergraduate students from across the country and abroad every year as part of its Undergraduate Student Program.
- Apply for NSERC Undergraduate Program awards such as USRA to work in a lab in the summer.
- Establish a professional presence on social media (e.g., LinkedIn).
- Learn about local issues! Consider a CSE Alternative Reading Week (ARW) to become engaged with the local community, involved in social change, community development and contribute to a community-based project.
- Expand your leadership and communication skills in global citizenship. Learn about and prepare for a future UTM Abroad Experience through the IEC to strengthen and enhance your intercultural skill set, and learn about other cultures while sharing your own!
- Prepare for admission tests (LSAT, MCAT), and research funding opportunities (OGS, NSERC, CIHR) for graduate studies.
- Consider applying for the CPS400Y5 internship course. Speak to the CPS Academic Counsellor for more details.
- Log on to ACORN and request graduation.

**4TH OR FINAL YEAR**
- Enroll in courses JCP424H5, PHY426H5 or PHY433H5 or JCP426H5, and 1.0 credit from PHY473H5 or JCP410H5 or JCP425H5 or CPS488Y5 or CPS490Y5 or CPS495Y5 or PHY399Y5.
- Senior students complete a research project. Speak to the CPS Academic Counsellor to discover available opportunities such as Independent Study Courses PHY473H5 and CPS488Y5.
- What is Experiential Education? It means learn by doing! Consider applying for the CPS400Y5 internship course. Speak to the CPS Academic Counsellor for more details.
- Log on to ACORN and request graduation.
- Skills are transferable to any job regardless of where you develop them. Need to strengthen your presentation skills? Consider taking EDU325H5 which allows you to earn a course credit in addition to a placement opportunity as a RGASC Facilitated Study Group Leader.

**HOW TO USE THIS PROGRAM PLAN**
- Read through each year. Investigate what appeals to you here and in any other Program Plans that apply to you.
- Visit www.utm.utoronto.ca/program-plans to create your own plan using My Program Plan.
- Update your plan yearly.

**Visit www.utm.utoronto.ca/program-plans for the online version and links.**

[8/21/2023]

*Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.*
Skills developed in Biophysics

To be competitive in the job market, it is essential that you can explain your skills to an employer. Visit the Career Centre to learn how to articulate and market the following skills:

**Technical:** strong emphasis on lab work using state-of-the-art technology and advanced instrumentation.

**Communication:** ability to explain complex concepts and theories to others; clearly explain scientific research; and write reports.

**Research:** define a problem; establish hypotheses; apply and integrate fundamental scientific principles; gather scientific data; and review scientific literature.

**Problem-solving:** seeing relationships among factors; analyze data; and interpret observations.

Get involved

Check out the 100+ student organizations on campus. Here are a few:

- UTM Physics Club
- Erindale Chemical and Physical Sciences Society (ECPS)
- UTM Student Union (UTMSU)
- UTM Athletics Council (UTMAC)

For a listing of clubs on campus visit the Student Groups and Societies Directory

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Department of Chemical & Physical Sciences

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FUTURE STUDENTS

Admission to UTM

All program areas require an Ontario Secondary School Diploma, or equivalent, with six Grade 12 U/M courses, or equivalent, including English. Your admission average is calculated using English plus your next best five courses. The Grade 12 prerequisites for Biophysics are Advanced Functions, Physics and Chemistry. The approximate average required for admission is mid- to high 70s. More information is available at utm.utoronto.ca/viewbook.

**NOTE:** During the application process, applicants will select the Chemical & Physical Sciences admissions category but will not officially be admitted to a formal program of study (Specialist, Major, and/or Minor) until after first year.

Sneak Peek

How are physics and the elasticity of muscles connected? Find out in PHY255H5, a course that applies Physics to biomedical phenomena. Medical techniques such as ultrasound imaging, magnetic resonance imaging, and laser surgery will be discussed.

Our students have access to new, state-of-the-art teaching laboratories and are involved in cutting-edge research projects in our research labs. Our physics equipment ranges from basic mechanic setups all the way to an atomic force microscope (AFM) that can achieve single atom resolution.

We have an active undergraduate student club—the UTM Physics Club—to provide students with an opportunity for fun physics-based activities. To date, the main task has been building a Tesla coil that will play music.

Student Recruitment & Admissions

Innovation Complex, Room 1270 University of Toronto Mississauga 3359 Mississauga Rd Mississauga ON Canada L5L 1C6

905-828-5400 www.utm.utoronto.ca/future-students