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

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.

UNIVERSITY OF TORONTO MISSISSAUGA

	1ST YEAR	2ND YEAR	3RD YEAR	4TH OR FINAL YEAR
PLAN YOUR ACADEMICS*	Enrol in courses (PHY146H5 and PHY147H5) or (PHY136H5 and PHY137H5); BIO152H5; CHM110H5 and CHM120H5; [(MAT132H5 or MAT135H5 or MAT137H5 or MAT157H5) and (MAT134H5 or MAT136H5 or MAT139H5 or MAT159H5)] or MAT135Y5 or MAT137Y5 or MAT157Y5; ISP100H5. Choose a program of study (Subject POSt) 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 utmONE course. Build community and gain academic support through **LAUNCH**. Join a RGASC **Peer Facilitated Study Group**.	Enrol in courses PHY241H5 and PHY245H5 and PHY255H5; JCP221H5 and JCP265H5; MAT223H5 and MAT232H5 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.	Enrol in courses PHY324H5 and PHY332H5 and PHY333H5 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	Enrol in courses JCP421H5; PHY426H5 or PHY433H5 or JCP463H5; and 1.0 credit from PHY473H5 or JCP410H5 or JCP422H5 or CPS489Y5 or CPS400Y5 or JCB487Y5 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 CPS489Y5. 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.
BUILD SKILLS	Use the **Co-Curricular Record (CCR)**. Search for opportunities beyond the classroom, and keep track of your accomplishments. Attend the **Get Hired Fair** through the Career Centre (CC) to learn about on- and off-campus opportunities. Attend the **Experiential Education Fair.**	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-Study program**. View position descriptions on the CLNx. Sign up to become an **Experiential Education Unit Student Ambassador** and earn a CCR notation.	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.	Skills are transferrable to any job regardless of where you develop them. Need to strengthen your presentation skills? Consider taking EDS325H5 which allows you to earn a course credit in addition to a placement opportunity as a RGASC **Facilitated Study Group Leader**.
BUILD A NETWORK	Networking simply means talking to people and developing relationships with them. Start by joining the **UTM Physics Club**. Go to the Erindale Chemical & Physical Sciences Society's **Meet the Profs Night**. Visit the UTM Library **Reference Desk**.	Do you have a professor you really like or connect with? Ask them a question during office hours. Discuss an assignment. Go over lecture material. Don't be shy! Learn **Tips On How to Approach a Professor** available through the Experiential Education Unit (EEU).	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.	Join a professional association. Check out the **Canadian Association of Physicists** or the **American Physical Society**. Go to the **Canadian Undergraduate Physics Conference** or the **Canadian Conference for Undergraduate Women in Physics.**
BUILD A GLOBAL MINDSET	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'IN**, 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!	Expanding your intercultural awareness and developing intercultural skills will help you in your academics, personal growth and are highly sought out by employers. **Earn 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!	Engage in programs like **ISTEP** and **THRIVE** to support your transition out of the University!
PLAN FOR YOUR FUTURE	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.	What's your next step after undergrad? Entering the workforce? Evaluate your career options through a CC **Career Counselling appointment**. Create a job search strategy - book a CC **Employment Strategies appointment**. Considering further education? Research application requirements, prepare for admission tests (LSAT, MCAT), and research funding options (OGS, NSERC, CIHR) for graduate studies.	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**. Ready to transition from the classroom to the workplace? Check out the **Recent Graduate Opportunities Program (RGOP).**

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

Revised on: 8/21/2023

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

BIOPHYSICS

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

Services that support you

- **Accessibility Services (AS)**
- **Career Centre (CC)**
- **Centre for Student Engagement (CSE)**
- **Equity, Diversity & Inclusion Office (EDIO)**
- **Experiential Education Unit (EEU)**
- **Health & Counselling Centre (HCC)**
- **Indigenous Centre (IC)**
- **International Education Centre (IEC)**
- **Office of the Registrar (OR)**
- **Recreation, Athletics and Wellness Centre (RAWC)**
- **Robert Gillespie Academic Skills Centre (RGASC)**
- **UTM Library, Hazel McCallion Academic Learning Centre (HMALC)**

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

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