Biomedical Physics (HBSc)

Biomedical Physics 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 Biomedical physicists 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 Biomedical Physics 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.
## BIOMEDICAL PHYSICS 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](http://www.utm.utoronto.ca/program-plans) to create your own plan using My Program Plan. Update your plan yearly.

### PLAN YOUR ACADEMICS

<table>
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<th>YEAR</th>
<th>REQUIREMENTS</th>
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| 1st | Enrol in courses PHY146H5, PHY147H5, BIB150H5, (CHEM121H5, 122H5) and (MAT135H5, 136H5)/MAT136H5/137Y5. Choose a program of study (Subject POSH) once you complete 4.0 credits. Use the Degree Explorer Planner and the Academic Calendar to plan your degree. Start strong and get informed with [utmONE and LAUNCH](https://www.utm.utoronto.ca/program-plans) through the Centre for Student Engagement (CSE). Join a RGASC Peer Facilitated Study Group. Review Degree Explorer Planner to plan your degree. Use the [ROPS Course Prerequisites](https://www.utm.utoronto.ca/program-plans) to ensure you complete your degree and program requirements. 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. Apply to [TRENDF - Canada's national laboratory for particle and nuclear physics](https://www.utm.utoronto.ca/program-plans) - that accepts 70 undergraduate students from across the country and abroad every year as part of its Undergraduate Student Program. | Enrol in courses PHY241H5, PHY242H5, PHY255H5, JCP299H5, JCP221H5, MAT235H5, 212H5/244H5/ STA256H5, BIB206H5. 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 P.A.R.T. to enhance your research skills. Throughout your undergraduate degree: use the Degree Explorer to ensure you complete your degree and program requirements. use the Office of the Registrar and the CPS Academic Counsellor to discover available opportunities such as Independent Study Courses PHY473H5 and PHY489Y5. Through 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). Enrol in courses PHY324H5, PHY325H5, PHY332H5, PHY333H5, PHY347H5, JCP321H5, JCP322H5. Apply to [TRIUMF](https://www.utm.utoronto.ca/program-plans) - 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. | Enrol in courses PHY426H5, PHY451H5, (PHY433H5/ JCP463H5, PHY473H5)/ JCP489Y5/ CPS400Y5/ JCB487Y5/ JCP421H5. 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. Application for NSERC Undergraduate Program awards such as USRA to work in a lab in the summer. | Enrol in courses PHY426H5, PHY451H5, (PHY433H5/ JCP463H5, PHY473H5)/ JCP489Y5/ CPS400Y5/ JCB487Y5/ JCP421H5. Senior students complete a research project. Speak to the CPS Academic Counsellor to discover available opportunities such as Independent Study Courses PHY473H5 and PHY489Y5. Throughout your undergraduate degree: use the Degree Explorer to ensure you complete your degree and program requirements. use the Office of the Registrar and the CPS Academic Counsellor to discover available opportunities such as Independent Study Courses PHY473H5 and PHY489Y5. Consider a role as a RGASC Facilitated Study Group Leader. | (Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.)

### BUILD SKILLS

- **For Your Mindset**
  - Global
  - Build a
- **For Your Plan**
  - Mindset

### 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).
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### BUILD A GLOBAL MINDSET

- Attend events held by the International Education Centre (IEC), whether you are an international or domestic student. Explore different cultures through food, music, and sport or through sight-seeing around the GTA.
- Embark on a UTM Abroad Experience through the IEC. Take advantage of this opportunity to travel as part of a class, or a co-curricular opportunity, and learn about a topic of interest in a unique location.
- Earn credits overseas! Study for a summer, term or year at one of 120 universities. The CPS department has identified partners which are most relevant to our students. Speak to the IEC or the CPS Academic Counsellor to find postings.
- Why not work abroad? Read up on worldwide employment trends and industry outlooks through GoGlobal. Attend the Go Global Expo. See if you are eligible for International Experience Canada.

### 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 Externs Job Shadowing Program.
- 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. Application for NSERC Undergraduate Program awards such as USRA to work in a lab in the summer. | Visit [www.utm.utoronto.ca/program-plans](https://www.utm.utoronto.ca/program-plans) to discover available opportunities such as Independent Study Courses PHY473H5 and PHY489Y5. Throughout your undergraduate degree: use the Degree Explorer to ensure you complete your degree and program requirements. use the Office of the Registrar and the CPS Academic Counsellor to discover available opportunities such as Independent Study Courses PHY473H5 and PHY489Y5. Consider a role as a RGASC Facilitated Study Group Leader. | (Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.) | (Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.) | (Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.) | (Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.)

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*Visit [www.utm.utoronto.ca/program-plans](http://www.utm.utoronto.ca/program-plans) for the online version and links.*

*Revised on: 6/5/2019*
Skills developed in Biomedical Physics

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 [www.utm.utoronto.ca/clubs](http://www.utm.utoronto.ca/clubs).

Services that support you

- Accessibility Services (AS)
- Career Centre (CC)
- Centre for Student Engagement (CSE)
- 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

William Davis Building, 4037A University of Toronto Mississauga 3359 Mississauga Rd Mississauga ON Canada L5L 1C6

905-828-5351; 905-828-3800 cpscounsellor.utm@utoronto.ca

www.utm.utoronto.ca/cps

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 Biomedical Physics 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](http://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](http://www.utm.utoronto.ca/future-students)