

# BIOTECHNOLOGY (HBSc)

*Department of Biology*

**Biotechnology** is the “application of scientific and technical advances in life science to develop commercial products”. This discipline combines biological sciences (genetics, biochemistry, molecular biology, microbiology, cell biology) with other science disciplines (chemistry, engineering, information technology, robotics, etc.). Advancement in biotechnology sees direct application in agriculture (e.g. genetic modification of food, environmental products), medicine (e.g. drug production, gene therapy), and industry (e.g. ‘white biotechnology’). With such rapid growth in this area, biotechnologists will play a vital role in shaping the future.

UTM Biology is a dynamic community. With nearly 40 active research scientists, more than one hundred graduate students and many post-doctoral fellows doing state-of-the-art research using the latest techniques, our students will have the opportunity to learn from the best. Our undergraduate research projects and summer student placements in research labs will give students valuable, first-hand experience working in a laboratory environment.

## 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](http://www.utm.utoronto.ca/program-plans)

### Programs of Study (POSt)

- Specialist Program ERSPE1118 Biotechnology (Science)

#### Check out...

Learn how to clone! In BIO314H5, you'll perform advanced molecular biology techniques including cloning and transformation of bacteria and plants. Get excited about disease! In BIO315H5 you'll learn exciting new topics in the structure and function of normal and diseased cells.

### 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:** Pharmaceutical financial analyst; Biological technician; Regulatory / government affairs specialist; Compliance promotion specialist; Pharmacologist; Informationist; Doctor; Physician's assistant; Nurse; Quality controller; Food science technologist / food scientist; Biotechnologist.

**Workplaces:** Manufacturing and processing; Government; Scientific R&D; Zoos, aquariums, national/ provincial parks; Hospitals and medical centres; Pharmaceutical; Academic medical centres/ laboratories; Consulting firms.



# BIOTECHNOLOGY

## 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.



	1 <sup>ST</sup> YEAR	2 <sup>ND</sup> YEAR
PLAN YOUR ACADEMICS*	<p>Enrol in courses BIO152H5, BIO153H5, MAT132H5, MAT134H5, CHM110H5, CHM120H5, MGM101H5 and MGM102H5.</p> <p>Choose a program of study (Subject POST) once you complete 4.0 credits. Use the <b>Degree Explorer</b> and the <b>Academic Calendar</b> to plan your degree.</p> <p>Develop foundational academic skills and strategies by enrolling in a <b>utmONE</b> course. Build community and gain academic support through <b>LAUNCH</b>.</p>	<p>Enrol in BIO200H5, BIO206H5, BIO207H5, BIO259H5, CHM211H5, CHM242H5, CHM243H5 and at least one of BIO202H5 or BIO203H5</p> <p>Throughout your undergraduate degree:</p> <ul style="list-style-type: none"> <li>use the <b>Degree Explorer</b> to ensure you complete your degree and program requirements.</li> <li>see the <b>Office of the Registrar</b> about degree requirements and the <b>Biology Undergraduate Advisor</b> about program requirements.</li> </ul>
BUILD SKILLS	<p>Use the <b>Co-Curricular Record (CCR)</b>. Search for opportunities beyond the classroom, and keep track of your accomplishments.</p> <p>Attend the <b>Get Hired Fair</b> through the Career Centre (CC) to learn about on- and off-campus opportunities.</p> <p>Attend the <b>Experiential Education Fair</b>.</p>	<p>Use the <b>Career &amp; Co-Curricular Learning Network (CLNx)</b> to find postings for on- and off-campus work and volunteer opportunities as well as <b>Work-Study</b>.</p> <p>Ask your professor about volunteering in their lab.</p>
BUILD A NETWORK	<p>Networking simply means talking to people and developing relationships with them. Start by joining the <b>Erindale Biology Society (EBS)</b>. Follow them @utmEBS. Go to the <b>EBS Meet the Prof Night</b>, or the <b>Biology Seminar Series</b>.</p> <p>Visit the UTM Library <b>Reference Desk</b>.</p>	<p>Do you have a professor you want to connect with? Ask them a question during office hours. Discuss an assignment. Go over lecture material. Don't be shy! Learn <b>Tips On How to Approach a Professor</b> available through the Experiential Education Unit (EEU).</p>
BUILD A GLOBAL MINDSET	<p>Engage with the many programs offered by the <b>International Education Centre (IEC)</b>, whether you are an international or domestic student. Consider joining the <b>Canada Eh?</b> day trips or <b>English Language Conversation Circles</b> to deepen your global mindset.</p> <p>First-year international students can also take advantage of <b>THRIVE-IN</b>, a one-day conference dedicated to helping you start your UTM journey successfully.</p>	<p>Get a global experience through our <b>Biology Seminar Series</b>. Every Friday during the academic year, the Department of Biology hosts an exciting seminar given by a guest speaker. Guest speakers are from Ontario, across Canada, as well as International. Topics cover every aspect of biology. All Biology students are welcome to attend.</p>
PLAN FOR YOUR FUTURE	<p>Attend the <b>Program Selection &amp; Career Options workshop</b> offered by the Office of the Registrar and the CC. Speak to the <b>Biology Undergraduate Advisor</b> for biology program advice and details.</p> <p>Do you have any questions? Stop by the Hello desk in the <b>Student Services Hub</b>. Our Career Centre team is ready to support you.</p>	<p>Learn how your academics and career goals work together in a <b>Career Counselling appointment</b>.</p> <p>Explore careers through the CC's <b>Job Shadow Program</b> or <b>In the Field</b>.</p> <p>Considering <b>further education</b>? Attend the CC's <b>Graduate &amp; Professional Schools Fair</b>. Research application requirements, prepare for admission tests (LSAT, GMAT) and research funding options (OGS, SSHRC).</p>

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

3 <sup>RD</sup> YEAR	4 <sup>TH</sup> OR FINAL YEAR
<p>Enrol in BIO314H5, BIO315H5, BIO360H5, BIO370Y5, BIO372H5, BIO374H5; CHM311H5 and CHM361H5.</p> <p>1.0 credit from 3rd and 4th year courses as seen in the <b>Academic Calendar</b> for course requirements and options.</p> <p>Attend the RGASC's <b>Program for Accessing Research Training (PART)</b> to enhance your research skills.</p>	<p>Enrol in JBC472H5 and ensure you attain 1.0 credit from CHM/BIO courses at the 400 level. Ensure you have at least 7.0 credits at the 300/400 level, of which 1.5 must be at the 400 level.</p> <p>Gain practical research experience! Apply for <b>JCB487Y5</b> or <b>BIO481Y5</b>. Speak to the <b>Biology Undergraduate Advisor</b>.</p> <p>Log on to ACORN and request graduation.</p>
<p>Explore your interests. Why not pass on your passion for science? Be a <b>UTM Let's Talk Science Outreach</b> volunteer.</p> <p>Sign up to become an <b>Experiential Education Unit Student Ambassador</b> and earn a CCR notation.</p>	<p>Consider applying for a NSERC USRA or UoF Research Excellence Award to complete a project in the summer following your fourth year.</p>
<p>Establish a professional presence on social media (e.g., LinkedIn).</p> <p>Curious about grad school? Connect with a grad student through the CSE's <b>Grad Connect</b> program to get the inside scoop.</p>	<p>Join a professional association. Check out the <b>Canadian Association for Plant Biotechnology</b>.</p> <p>Go to the <b>Ontario Biology Day</b>, or the <b>Canadian Undergraduate Conference on Healthcare</b>.</p>
<p>Expanding your intercultural awareness and developing intercultural skills will help you in your academics, personal growth and are highly sought out by employers.</p> <p><b>Earn credits overseas!</b> Apply to study for a summer term, or year at one of 170+ universities. Speak to the IEC for details about <b>Course Based Exchange</b>, funding and travel safety. Attend Global Learning Week to learn about the various opportunities available to you!</p>	<p>Engage in programs like <b>ISTEP</b> and <b>THRIVE-OUT</b> to support your transition out of the University!</p>
<p>Attend CC workshops to learn the basics of creating a resume and cover letter, preparing for an interview, and creating a strong LinkedIn profile. To register, visit the UTM Events page on <b>CLNx</b>. You would also find exciting networking opportunities to connect with employers, industry professionals and alumni.</p> <p>Are you ready to take the next step in preparing for further education? Get started by checking out the Pursue Learning session of <b>My Career Centre</b> and attending a drop-in session with a Career Counsellor for best practices for grad school preparation.</p>	<p>Attend the CC workshop <b>Now That I'm Graduating What's Next</b>, to learn how to develop your job search plan.</p> <p>Ready for employment? Schedule an <b>Employment Strategist Appointment</b> to review your documents and practice your skills. If you are still unsure about the next steps in your career journey, schedule a <b>Career Counsellor Appointment</b> to gain support exploring career options and establishing a career plan.</p>

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

# BIOTECHNOLOGY

## Skills developed in Biotechnology

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:

**Communication & interpersonal:** write scientific reports; present research findings; interact professionally with a multidisciplinary team of researchers, technicians, students and professors; and literacy writing.

**Research:** conduct journal research and utilize logical reasoning to interpret results/data derived from scientific experimentation.

**Technical:** use specialized computer programs; perform laboratory procedures; maintain laboratory equipment and instrumentation; and comply with quality control procedures.

**Quantitative:** analyze data for trends and apply statistical tests to data.

**Critical thinking & problem-solving:** logically interpret trends and results.

## Get involved

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

- Erindale Biology Society (EBS)
- UTM Student Union (UTMSU)
- UTM Athletics Council (UTMAC)

For a full 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)**
- **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 Biology

William G. Davis Building, Rm 3056  
University of Toronto Mississauga  
3359 Mississauga Rd  
Mississauga ON Canada L5L 1C6

Undergraduate Advisor: 905-828-3876  
[stephanie.dorego@utoronto.ca](mailto:stephanie.dorego@utoronto.ca)  
[www.utm.utoronto.ca/biology](http://www.utm.utoronto.ca/biology)

## 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. The admission average is calculated with English plus the next best five courses. The Grade 12 prerequisites for this program are Advanced Functions, Biology and Chemistry. The approximate average required for admission is low- to mid-80s. More information is available at [utm.utoronto.ca/viewbook](http://utm.utoronto.ca/viewbook).

**NOTE:** During the application process, applicants will select the Life 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

Curious about pharmacology? Take BIO200H5 and learn about the absorption and calculation of dosages. Our courses are taught by faculty from the departments of Biology, Chemistry and Management, as well as from the Master of Biotechnology.

Effective biological training involves careful study of real organisms, both living and dead. Consequently, almost all Biology courses with laboratories involve students in one or more of the following activities with animals, plants, and/or microorganisms: collecting and preserving organisms from the field; dissecting or handling preserved or euthanized specimens (or properly anaesthetized living specimens); observing and making measurements on organisms maintained under laboratory conditions approved by the Canadian Council of Animal Care.

### 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)

