

# 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.

## 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)
- Minor Program ERMIN2364 Biology (Science)

### Check out...

Learn how to clone! In BIO314, 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, 153H5; CHM110H5, 120H5; and MAT134Y5/ 135Y5/ 137Y5. Attain 1.0 credit from the second list of required first year courses in the <b>Academic Calendar</b>.</p> <p>Choose a program of study (Subject POST) once you complete 4.0 credits. Use the <b>Degree Explorer</b> Planner and the <b>Academic Calendar</b> to plan your degree.</p> <p>Start strong and get informed with <b>utmONE</b> and <b>LAUNCH</b> through the Centre for Student Engagement (CSE). Join a RGASC <b>Peer Facilitated Study Group</b>.</p>	<p>Enrol in MGM101H5, 102H5; BIO200H5, 202H5/ 203H5, 206H5, 207H5; CHM211H5, 242H5, 243H5; and STA215H5.</p> <p>Attend the RGASC's <b>Program for Accessing Research Training (P.A.R.T.)</b> to enhance your research skills.</p>
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 Experience Fair</b> through the Career Centre (CC) to learn about on- and off-campus opportunities.</p>	<p>Use the <b>Career Learning Network (CLN)</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 Biology department's <b>Walk with your Professor</b>.</p> <p>Visit the UTM Library <b>Reference Desk</b>.</p>	<p>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 <b>Tips On How to Approach a Professor</b> available through the Experiential Education Unit (EEU).</p>
BUILD A GLOBAL MINDSET	<p>Attend events held by the <b>International Education Centre (IEC)</b>, whether you are an international or domestic student. Explore different cultures through food, music, and sport or through sight-seeing around the GTA.</p> <p>Start with the <b>International Education Week</b> events and learn about the diversity, culture, and international opportunities on campus!</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. Feel free to bring your lunch!</p>
PLAN FOR YOUR FUTURE	<p>Attend the <b>Program Selection &amp; Career Options</b> workshop offered by the Office of the Registrar and the CC.</p> <p>Check out <b>Careers by Major</b> at the CC to see potential career options.</p>	<p>Explore careers through the CC's <b>Extern Job Shadowing Program</b>. Ask the <b>Biology Undergraduate Assistant</b> about the <b>BioPath: Professional Development Program</b>.</p> <p>Considering <b>further education</b>? Attend the CC's <b>Graduate and Professional Schools Fair</b>. Talk to professors – they are potential mentors and references for further education.</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>For third year and higher, view the <b>Academic Calendar</b> for course requirements and options.</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>	<p>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 collaborative research experience! Apply for JCB487Y5. 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 UTM <b>Let's Talk Science Outreach</b> volunteer.</p> <p>Apply to become a <b>Wellness Ambassador</b> with the Health &amp; Counselling Centre's Physical Health team.</p>	<p>Apply to the Ontario Ministry of Natural Resources Internship Program as a recent graduate. Look at the <b>MNR website</b> for eligibility and application details.</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>Interested in deepening your global perspective? Register for the <b>Global Citizenship Certificate</b> offered by the IEC.</p> <p>Get involved with a <b>Community Action Project</b> through the CSE and build your skills in intercultural communication and teamwork!</p>	<p>Why not work abroad? Read up on worldwide employment trends and industry outlooks through <b>GoInGlobal</b>. Attend the <b>Go Global Expo</b>.</p>
<p>What's your next step after undergrad?</p> <p>Entering the workforce? Evaluate your career options through a CC <b>Career Counselling appointment</b>. Create a job search strategy — book a CC <b>Employment Strategies appointment</b>.</p> <p>Considering further education? Research application requirements, prepare for admission tests (LSAT, MCAT), and research funding options (OGS, NSERC, CIHR)</p>	<p>Market your skills to employers. Get your <b>resume critiqued</b> at the CC. Attend the CC workshop <b>Now That I'm Graduating What's Next?</b></p> <p>Write a strong application for further education. Attend the CC's <b>Mastering the Personal Statement workshop</b>.</p>

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# 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 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 Biology

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[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)

