

# ECOLOGY AND EVOLUTION (HSBc)

## Department of Biology

**Ecology** is the study of relations of organisms to each other and their environment. Evolution is, as described by Charles Darwin, “descent with modification”. Ecology and evolution are sister disciplines, both encompassing the study of natural selection, life history, development, adaptation, population, and inheritance. Ecology and evolution are broad disciplines seeking to understand the origins, diversity, and distribution of organisms. Biologists in this field recognize that all life has evolved and an understanding of the factors influencing the origin and maintenance of biological diversity is critical to all life on this planet. Research in this area seeks to help society make informed decisions about sustainable development, global temperature change, control of invasive species, preservation of genetic diversity and ecosystem integrity, as well as the control of emerging infectious diseases.

UTM Biology is a dynamic community. With nearly 40 active research scientists, more than 100 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 ERSPE1020 Ecology and Evolution (Science)

### Check out...

Dive into marine biology! In BIO378H5 you'll explore the evolution of marine mammals, their adaptations to aquatic environments, as well as their population and behavioural ecology. Investigate threats to marine mammal populations and their conservation.

### 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:** Environmental health officer; Restoration biologist; Conservation officer; Agronomist; Entomologist; Zoologist; Marine biologist; Ecologist; Biological technician; Environmental educator; Regulatory/ government affairs specialist; Veterinary technician; Clinical research coordinator assistant; Informationist; Aquaculture technician; Herbarium technician.

**Workplaces:** Government; Scientific R&D; Zoos; Aquariums; National/provincial parks; Academic medical centres/laboratories; Non-profit agencies; Non-government organizations.



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## 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; CHM110H5, CHM120H5; MAT132H5 and MAT134H5. 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> 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>. Join a RGASC <b>Peer Facilitated Study Group</b>.</p>	<p>Enrol in courses BIO202H5, BIO203H5, BIO205H5, BIO206H5, BIO207H5 and BIO259H5.</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 class room, 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 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 Biology department's Walk with a Biologist.</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 <b>Experiential Education Unit (EEU)</b>.</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>Speak to the <b>Biology Undergraduate Advisor</b> for biology program advice and details.</p> <p>Attend the <b>Program Selection &amp; Career Options workshop</b> 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>Job Shadow Program</b>.</p> <p>Considering <b>further education</b>? Attend the CC's <b>Graduate &amp; 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>Enroll in BIO313H5, BIO342H5, BIO443H5 and BIO360H5. Take 1.0 credit from courses in organismal biology, 0.5 credit from field courses, 2.0 credits from core ecology/evolutionary biology courses. View the <b>Academic Calendar</b> for course requirements and options.</p> <p>Consider applying for the <b>Research Opportunity Program (ROP)</b> course BIO399Y. Visit the EEU website for <b>ROP Course Prerequisites</b>. Attend the RGASC's <b>Program for Accessing Research Training (PART)</b> to enhance your research skills.</p>	<p>Take 1.0 credits from other UTM biology courses at the 300/ 400 level and 1.0 credit from related courses from other departments as seen in the Academic Calendar.</p> <p>Complete 0.5 CR field course such as BIO332H5, BIO444H5 or any Ontario Universities Program in Field Biology (OUPFB). Conduct a research project under the supervision of a faculty member through BIO481Y5.</p> <p>Log on to ACORN and request graduation.</p>
<p>Learn techniques ecologists use in the field! Use field ornithology techniques in BIO326H5, and gain practical exposure to research methods of plant, animal, and microbial communities in BIO313H5. Speak to the <b>Biology Undergraduate Advisor</b>.</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 Society for Ecology and Evolution</b> and <b>South Peel Naturalists' Club</b> who promote the preservation and conservation of local flora and fauna, land and water.</p> <p>Go to UofT's <b>Ecology &amp; Evolutionary Biology Annual Atwood Colloquium</b> or attend <b>Ontario Biology Day</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>Do you want to study dolphin and whale biology and conservation in tropical Asia, or the ecology of the Arctic? Enrol in BIO416H5 to choose from a variety of field courses offered through the <b>Ontario Universities Program in Field Biology</b>.</p> <p>Consider taking JBH471 - Worlds Colliding: The History and Ecology of Exploration, Contact, and Exchange.</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 Strategiest 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> <p>Ready to transition from the classroom to the workplace? Check out the <b>Recent Graduate Opportunities Program (RGOP)</b>.</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.



# ECOLOGY AND EVOLUTION

## Skills developed in Ecology and Evolution

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:** collect and preserve field organisms; dissect preserved or euthanized specimen; inspect specimens; and analyze and evaluate information.

**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)**
- **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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## 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

What is nutrient cycling? Take BIO205H5 and learn about the scientific study of ecology. Topics include regulation, competition and biodiversity.

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)

