Bioinformatics is an interdisciplinary science that combines Biology, Computer Science, Statistics, Mathematics, and Chemistry. Bioinformatics is the management of large amounts of biological information generated from research using advanced computational methods and programs. The program includes various courses in genetics and molecular biology, which will contextualize genomic data and explain how it is isolated, sequenced and analyzed. Our computer science courses will give you the foundation to write the computer programs required to analyze large amounts of data.

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

Program of Study (POSt)

- Specialist Program ERSPE1868 Bioinformatics (Science)

Check out...

Get excited about disease! Take BIO315H5 and learn about exciting new topics in the structure and function of normal and diseased cells. Topics include intercellular communication, and intracellular trafficking and their underlying roles in the disease process. What is the molecular and genetic basis of cancer building? Take BIO477H5 and examine the role of oncogenes, tumor suppressor genes and cell cycle regulating proteins in the development of cancers.

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:** Operations research analyst; Bioinformatics specialist; Epidemiologist; Informationist; Biostatistician; Quality controller; Research technician; Validation specialist; Bioethicist; Geneticist; Pharmacy technician; Data scientist; Computer programmer; Systems analyst.

**Workplaces:** Manufacturing companies; Government; Industrial inspection firms; Scientific R&D; Pharmaceuticals; Hospitals; Computer/software/telecommunication companies.
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.

BIOINFORMATICS SPECIALIST Program Plan

1ST YEAR

- Choose a program of study (Subject POS) 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 uTIME course. Build community and gain academic support through LAUNCH. Join a RGASC Peer Facilitated Study Group.

2ND YEAR

- Enrol in courses BIO206H5, 207H5, CHM242H5, CSC207H5, 236H5, 263H5, and MAT223H5/240H5.
- Throughout your undergraduate degree:
  - use the Degree Explorer to ensure you complete your degree and program requirements.
  - see the Office of the Registrar and the MCS Undergraduate Counsellor for assistance.

3RD YEAR

- Consider applying for Research Opportunity Program (ROP) courses BIO399Y, CSC399Y and CSC499Y. Visit the EEU website for ROP Course Prerequisites. Attend the RGASC’s P.A.K.T. to enhance your research skills.

4TH OR FINAL YEAR

- Enrol in courses CSC207H5, 236H5, 263H5; MAT223H5/240H5; CSC399Y and CSC499Y. Visit the EEU website for Research Opportunity Program (ROP). Throughout your undergraduate degree:
  - use the Degree Explorer to ensure you complete your degree and program requirements.
  - see the Office of the Registrar and the MCS Undergraduate Counsellor for assistance.

BUILD YOUR ACADEMICS

- Use the Co-Curricular Record (CCR). Search for opportunities beyond the classroom, and keep track of your accomplishments.
- Attend the Get Experience Fair through the Career Centre (CC) to learn about on- and off-campus opportunities.

BUILD SKILLS

- Networking simply means talking to people and developing relationships with them. Start by joining the Mathematical and Computational Sciences Society (MCSS). Follow them @utmmcss.
- Learn about potential mentors and references.
- Attend events held by the International Education Centre.

BUILD A NETWORK

- Get to know your TA. View the Math Learning Centre Schedule on the MCSS departmental website. Visit the UTM Library Reference Desk.
- Attend the Biology Department’s Bioinformatics Research Through the Global Education Unit (EEU).

BUILD A GLOBAL MINDSET

- Engage in programs like the Global and Intercultural Fluency Training Series (GIFTS) or learn about and prepare for a future UTM Abroad Experience through the IEC to strengthen and enhance your intercultural skillset, and learn about other cultures while sharing your own.
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PLAN FOR YOUR FUTURE

- Attend the Program Selection & Career Options workshop offered by the Office of the Registrar and the CC.
- Check out Careers by Major at the CC to see potential career options.
- Explore careers through the CC’s Job Shadowing Program.
- Consider further education? Attend the CC’s Further Education Showcase. Talk to professors – they are potential mentors and references.

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

FOR YOUR PLAN

- Update your plan yearly.
- Visit www.utm.utoronto.ca/program-plans for the online version and links.

Revised on: 10/27/2021
Skills developed in Bioinformatics

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:

**Research:** analyze and evaluate information, as well as conduct journal research.

**Technical:** write, debug, and test programs and research, design and develop computer systems (e.g., new computer languages, simulations, system analysis, etc.)

**Problem-solving:** conceptualize models; formulate, model, and solve problems from diverse areas; and collect, organize, analyze, and interpret results.

**Communication:** articulate, explain, and teach technical information to others, as well as question and probe to diagnose computer problems.

**Organizational:** manage time effectively and organize and maintain data that is stored.

Get involved

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

- Mathematical and Computational Sciences Society (MCSS)
- UTM Student Union (UTMSU)
- UTM Athletics Council (UTMAC)

For a listing of clubs on campus visit 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)
- The Math Learning Centre (MLC)
- UTM Library, Hazel McCallion Academic Learning Centre (HMALC)

Department of Mathematical & Computational Sciences

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www.utm.utoronto.ca/math-cs-stats/

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, Calculus, Biology and Chemistry. The approximate average required for admission is low to mid 80s. More information is available at utm.utoronto.ca/viewbook.

**NOTE:** During the application process, applicants will select the Computer Science, Mathematics & Statistics 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's in your genes? Take BIO207H5 to find out about the principles of Mendelian inheritance and modern genetics using examples from medical research, evolutionary biology, agriculture and conservation biology. The first two years of the program are an introduction to broadly applicable tools and ideas. You’ll learn computing languages, including Python (CSC108H5) and Java (CSC207H5), and you’ll get a peek at the mathematical techniques (CSC236H5) and data structures (CSC148H5 and CSC263H5) that underpin the discipline.

Student Recruitment & Admissions

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