**BIOINFORMATICS (HBSc)**

*Department of Mathematical & Computational Sciences*

**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.

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**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)

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**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.

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**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.
# Bioinformatics Specialist Program Plan

**1st Year**

- Enrol in courses BIO150H5, CHM110H5, 120H5, CSC108H5, 148H5, MAT102HS and (132H5, 134H5)/ (135H5, 136H5)/137Y5/157Y5.
- Choose a program of study (Subject POSt) 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 uTSG and LAUNCH through the Centre for Student Engagement (CSE). Join a RGASC Peer Facilitated Study Group.

**2nd Year**

- Enrol in courses BIO206H5, 207H5; CHM242H5, CHM207H5, 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 PA.R.T. to enhance your research skills.

**4th or Final Year**

- Attain 1.0 credits from a list of courses in the Academic Calendar of which at least 0.5 must be at the 400-level.
- Conduct bioinformatics research under the supervision of a faculty member in CBJ/4B1YS. Speak to the MCS Undergraduate Counsellor.
- Log on to ACORN and request graduation.

**Plan Your Academics**

- **Plan Your Academics**
  - Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.
  - Visit www.utm.utoronto.ca/program-plans to create your own plan using My Program Plan. Update your plan yearly.

**Build Skills**

- **Build Skills**
  - 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 A Network**

- **Build A Network**
  - Networking simply means talking to people and developing relationships with them. Start by joining the Mathematical and Computational Sciences Society (MCSS). Follow them @utsmcss.
  - Get to know your TA. View the Math Help Room Schedule on the MCS departmental website. Visit the UTM Library Reference Desk.

**Build A Global Mindset**

- **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.

**Plan For Your Future**

- **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.

**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 for the online version and links.
- Revised on: 5/29/2019
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)
- UTM Library, Hazel McCallion Academic Learning Centre (HMALC)

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 high-70s. 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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