Mathematical Biology (BSc)

Admission Requirements

Prerequisite Requirements for BSc:

- ENG4U, SBI4U, SCH4U, MHF4U, MCV4U
- Recommended: MPH4U
- Expected minimum admission average: high 70s – mid 80s

First Year Mathematical Biology Major Courses:

- Linear Algebra and Calculus
- Statistics
- Problems, Conjectures and Proofs
- Computing for Math and Statistics
- Biology
- Chemistry

The Math & Stats programs at York are designed so you can switch between any of our programs in the first three semesters and still finish your degree on time.

Second Year Mathematical Biology Major Courses:

- Multivariable Calculus
- Probability
- Differential Equations
- Symbolic Computational Lab
- Human Physiology or Anatomy
- Ecology
- Environmental Studies

Upper Year Mathematical Biology Course Options:

- Mathematical Biology
- Practicum in Mathematical Biology
- Mathematical Modelling
- Vector Integral Calculus
- Numerical Methods
- Probability Modelling
- Complex Variables
- Dynamical Systems
- Virology
- Cell Biology

York offers Canada’s only degree in Mathematical Biology. You will get a solid base of knowledge in mathematics with an emphasis on the applications of mathematics and computing in the medical, environmental, and public health fields. You will then specialize in areas like Mathematical Ecology, Medical Imaging, Public Health, Pharmaceutical Development, and many more. You may also combine your studies with a degree program in Science or Health.

You will demonstrate your learning outside of the lecture room. You can use the Experimental Math Space to study animal movement using robots or write simulations to model tree growth and infectious disease spread. You can research internships with our world-renowned faculty and industry/government partners. You will have access to The Centre for Disease Modelling (CDM). In your fourth year, you will acquire real-life problem-solving skills in a required research project, in partnership with faculty in Biology, Chemistry, Kinesiology, or industry or government partners.
Experiential Education

In this program, you will have substantial opportunities for experiential education.

- **Research**: You can participate in summer research with professors funded through the Research at York program (RAY) and the Undergraduate Student Research Award program (USRA). In fourth year, you can pursue research work for credit in specialized project courses.

- **Internships**: You can integrate your classroom learning with hands-on, paid work after your third year for 4, 8, 12, or 16 months.

Visit [yorku.ca/science/students/experiential-education/](yorku.ca/science/students/experiential-education/) for more information.

Research Highlights

The COVID-19 pandemic has brought mathematical modelling to the forefront. York University has one of the preeminent Mathematical Biology groups in Canada. Our world class faculty have been regularly featured in national and international media and interviews regarding COVID-19. They have also published more than 50 papers, and attracted 10 million dollars in research funding to fight the pandemic. Our faculty have all served in government advising roles over the pandemic. The research has been conducted with several undergraduate and graduate students.

Career Pathways for Mathematical Biology

Your studies in Mathematical Biology will prepare you for success in professional careers in disease prevention, pharmaceutical and vaccine development, advertising, behaviour analysis, ecology, media and space and aeronautics research, natural resource management, education, government, and for further professional or postgraduate studies.

- Conservationist; Natural Resource Management
- Pharmaceutical and Vaccine research
- Disease Prevention Specialist
- Scientific Consultant
- Disease Modeller
- Epidemiologist
- City Planning
- Ecologist
- Finance
- Doctor
- Forestry Industry; Oil and Gas industry
- Armed Forces/Intelligence Agencies Analyst
- Education- high school, college, university
- University researcher in Biology, Engineering, Medicine, Public Health, Environmental Studies