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Applied Mathematics

BA, BSc | www.yorku.ca/science/mathstats/applied-mathematics

Admission Requirements

BA
- ENG4U, MHF4U
- **Recommended:** MCV4U
- **Minimum admission average:** high 70s – mid 80s

BSc
- ENG4U, MHF4U,
- SBI4U, or SCH4U or SPH4U
- **Recommended:** MCV4U
- **Minimum admission average:** high 70s – mid 80s

Program Overview

Applied Mathematics at York University provides you with a balance of rigorous training in mathematics and the skills to solve real world problems. You will begin with core courses to build a solid foundation for applying mathematics and computing to science, engineering, and finance. You can then learn from world- class professors and combine your studies with other degree programs to build expertise in these application areas.

Applied Mathematics at York is a gateway to a career in innovation. When you graduate, you'll be familiar with modern mathematical models and the analytical and computational methods needed to solve them. You'll be prepared for a career in industries such as **finance, artificial intelligence, biomedicine, data mining, education, climatology, computer animation, and materials science**.

One of the strengths of the applied mathematics research program is disease modeling. In senior classes and research projects, students will have the opportunity to work on problems that are inspired by or have supported policy decisions in public health agencies throughout Ontario and Canada.

The "Applied" in Applied Mathematics

Applied Mathematicians at York use mathematical models and powerful computers to work on problems like:

- How can we predict change in interactions between ecosystems?
- How can we contain the spread of disease from a bioterrorism incident?
- How can we best allocate an investment among financial instruments?
- How can we use data on social media to measure market preferences?
- How can we estimate the risk of climate change for coastal communities?
- How can we improve energy storage for longer lasting batteries?
- How can we improve image quality for better disease diagnoses?
- How do we model a global pandemic and inform public policy making?

First Year Courses

- Differential and Integral Calculus
- Statistics
- Linear Algebra
- Computing for Math
- Introduction to Statistics

The Math & Stats programs at York are designed so you can switch between the majority of our programs in the first three semesters and still finish your degree on time. Students in the BSc degree will also take courses in other science fields such as Biology, Chemistry, or Physics.

Second Year Courses

- Probability
- Intermediate Linear Algebra
- Multivariable Calculus
- Scientific Computing
- Differential Equations

Upper Year Options

- Mathematical Modelling
- Partial Differential Equations
- Dynamical Systems and Chaos Theory
- Gas and Fluid Dynamics
- Linear and Nonlinear Optimization
- Mathematics of Cryptography
- Feedback Control Systems
- Numerical Analysis and Scientific Computing
- Perturbation Methods
- Data Analytics

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Experiential Education

Experiential Education (EE) gives students the opportunity to apply theories learned in the classroom to concrete experiences. Students in Applied Mathematics will engage in classroom EE through computer modelling and simulation. You will do courses in hands-on computing in advanced multimedia laboratories. In your fourth year you can take our Control Theory course, which will utilize our on-campus robotics lab. Opportunities for community-based EE will also be available to you through research projects, volunteering, networking, or becoming peer mentors.

Additionally, there are many ways for students to participate in research opportunities through research practicum courses, Research at York (RAY), Capstone Project Courses, NSERC USRA Research Awards, and Dean Undergraduate Research Awards.

Visit yorku.ca/science/students/experiential-education/ for more information about EE.

Possible Career Pathways

Our graduates go on to post-graduate and professional studies in mathematics and related science and social science fields. Possible career options for Applied Mathematics graduates include:

- Operations Researcher
- Mathematical Modeling Consultant
- Scientific Computing Specialist
- Cryptographer
- Biostatistician
- Modeling for government policy
- Engineering Consultant
- Financial Analyst
- Geolocation Engineer
- Game Mathematician
- Research Scientist
- Data Scientist
- Business Analyst
- Trader
- Risk Analyst
- Data Analyst
- Quantitative Model Developer
- Quantitative Analyst (Quant)
- Portfolio Manager
- Artificial Intelligence Engineer
- Quantitative Pharmacologist
- Mathematical modeling for Public Health
- Teacher

All York University students also have access to **The Career Centre**. Our Career Centre team provides resources and supports including, career fairs, employer networking events, skills development workshops, career counselling, and interview practice sessions.

Visit careers.yorku.ca to learn more.

Get In Touch

Domestic Students:
science@yorku.ca

International Students:
intlsci@yorku.ca

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"I chose York Science because I liked the variety of courses that were being offered for [Applied Mathematics]. I want to learn as much as I can and York Science and the Mathematics and Statistics Department offers me a program where I can get the most out of my academic career."

Michelle,
Applied Mathematics Student