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 first and second year courses to get a solid foundation for applying mathematics and computing to science, engineering, and commerce. You can then learn from world-class professors in specialized areas such as mathematical modelling, numerical analysis, or operations research. You can also combine your studies with other degree programs in Science and Engineering 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 like **finance, biomedicine, data mining, education, climatology, computer animation, and materials science, etc.**

The Applied Mathematics program at York offers a specialized Honours stream in **Financial Mathematics.** This program will prepare you for a career as a **quantitative analyst** (or ''quants'', as they say in the finance industry). Quants use mathematical and statistical tools to analyze financial instruments and financial markets. This analysis involves developing mathematical models, fitting models to market data, performing numerical computations, analyzing the results of these computations, and providing insight and information for decision making. This stream will prepare you for a position in the finance industry or for further studies at the Master's level.

First Year Courses:

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

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.

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
- Symbolic 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
- Monte Carlo Simulation

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Experiential Education

- **Research:** You can participate in summer research with professors funded through the Research at York program and the Undergraduate Student Research Award program. In your fourth year, you can do research work for credit by taking project courses.

- **Lab Experience:** You will do computer modelling and simulation. You will do courses in hands-on computing in our advanced multimedia laboratories. In your fourth year, you can take our Control Theory course, run in partnership with the Lassonde School of Engineering, using our robotics lab.

- **Internships:** The Internship Program provides you with the opportunity to integrate your classroom learning with hands-on, paid, work experiences. After your third year, you can do an internship and work for 4, 8, 12, or 16 months before returning to York to complete your degree.

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

The "Applied" in Applied Mathematics

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

- How can we predict long-term change in interactions between the oceans, the atmosphere and, living ecosystems?
- How can we contain the spread of disease from a bioterrorism incident?
- How can we allocate an investment among various financial instruments to meet a risk/reward trade-off?
- How can we use data on social media shares, likes, and comments to measure market preferences?
- How can we estimate the risk of climate change damaging coastal communities?
- How can we improve energy storage for better and longer lasting batteries?
- How can we improve the image quality for more accurate disease diagnoses and better treatment?

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 my program (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

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Possible Career Pathways for Applied Mathematics

Our graduates go on to post-graduate and professional studies in mathematics and related science and social science fields, and establish rewarding careers in diverse fields like:

- Operations Researcher
- Scientific Computing Specialist
- Biostatistician
- Engineering Consultant
- Geolocation Engineer
- Research Scientist
- Modeller
- Cryptographer
- Database Developer
- Financial Analyst
- Game Mathematician

Possible Career Pathways for Financial Mathematics

- Financial Planner
- Business Analyst
- Trader
- Risk Analyst
- Data Analyst
- Quantitative Model Developer
- Quantitative Analyst (Quant)
- Portfolio Manager