DISCOVER YOUR STORY IN MATHEMATICS
Unlock your potential.

If you think you love math now, just wait until you get here! Waterloo is home to North America’s only dedicated Faculty of Mathematics and a community of passionate math students. You’ll be surrounded by peers with the same interests, a supportive network, and countless opportunities to join clubs and teams to make new friends. With more than 8,000 students, 275 full time professors, and 500+ courses in mathematics, statistics, and computer science, your options are limitless. At Waterloo, you’ll create a unique educational path and graduate with the knowledge and experience for success wherever you want to go.

Let’s explore your story in the Faculty of Mathematics at Waterloo.

**BOARDROOM BOUND?**
Check out our Mathematics, Business, and Accounting programs to prepare you for a future in business.

**COMPUTER SAVVY?**
Waterloo’s David R. Cheriton School of Computer Science is world renowned. Check out our Computer Science options to learn more about the cutting-edge programs that will prepare you for a successful future.
BUILDING A COMMUNITY

ELI
STATISTICS AND ACTUARIAL SCIENCE, CO-OP FACULTY ORIENTATION LEADER

Eli dove headfirst into the community in her first year on campus – she joined the Actuarial Science Club and became a Math Ambassador. One of the things she’s most passionate about is welcoming new Mathies to Waterloo. That’s why she’s taken a leadership role in the Faculty Orientation Committee.

“I just really enjoy being outgoing and being loud. I have such a big passion for the Faculty of Math and I love sharing it with others.”

WHAT’S INSIDE

MATHEMATICS OVERVIEW 2
CO-OP 4
EXPERIENTIAL EDUCATION 6
MAJORS 8
APPLIED MATHEMATICS 9
COMBINATORICS AND OPTIMIZATION 9
ACTUARIAL SCIENCE 10
BIOSTATISTICS 11
STATISTICS 11
MATHEMATICAL OPTIMIZATION 12
MATHEMATICAL PHYSICS 12
COMPUTATIONAL MATHEMATICS 13
DATA SCIENCE 13
MATHEMATICAL STUDIES 14
MATHEMATICS/TEACHING 14
PURE MATHEMATICS 15
MATHEMATICAL ECONOMICS 16
MATHEMATICAL FINANCE 16
CAREER OPTIONS 17
COMMUNITY 18
ADMISSIONS 20

MORE TO EXPLORE

Meet us online for more tips and stories:

Facebook: Waterloo.Math
Twitter: WaterlooMath
Instagram: WaterlooMath
With hundreds of course options available, you can customize your degree to explore your passions and find new interests while expanding your love for math.

**MATHIE PRIDE**

Each year at Orientation, our dean welcomes new students to the Faculty with the math pledge, inducting the newest members of our Waterloo Mathematics family. It’s lots of fun seeing professors dress up for the ceremony, learning a dance and singing mathie songs – they’re all part of the tradition!

“Sine, sine, cosine, sine, 3.14159!”
IN THE CLASSROOM
In first year, it’s all about keeping your options open. Find what’s right for you by taking core courses in mathematics and computer science, plus one communications course and a non-math elective:
› Algebra
› Introduction to Computer Science
› Calculus
› Communications courses

IN-DEMAND JOB SKILLS
Employers today are looking for people who have a well-rounded education. You’ll stand out with your strong technical skills and an understanding of how to communicate effectively – a combination built for success.

HERE FOR YOU
Making the leap to university is exciting, and it’s also a life-changing step. At Waterloo, we have the resources to help you succeed. You can access academic support through the Mathematics Tutorial Centre, academic advisors, and the Student Success Office. Professional and peer counselling services are also available whenever you need support with any aspect of life.

Make your application stand out.

Interested in applying to a math program at Waterloo? Here are some tips.

CHALLENGE YOURSELF
Put your mathematical problem-solving abilities to the test and have fun doing it! Participation in contests like the Euclid and/or Canadian Senior Mathematics Contest in your final year of high school will give your application a boost and is required to be considered for scholarships. Find more information and contest dates on page 21.

GET A JUMP START
Did you know that Waterloo offers free, open courseware that can teach you new skills or supplement your programming knowledge to help you prepare for university? You’ll have access to lessons designed by world-class instructors, interactive worksheets, and unlimited opportunity for practice!

BECOME A WARRIOR FOR THE DAY
Experience the Waterloo difference firsthand! Check out our facilities, hear from fellow students, and get a taste of life as a Warrior, whether through a campus visit or from home. Visit our website for information on in-person and virtual tours to see what campus life is really like.
EXPERIENCE THAT ADDS UP

7,500+ employers across the globe
Get ahead of the competition by putting theory into practice in our world-renowned co-op program. Waterloo revolutionized experiential learning with the groundbreaking concept of co-operative education and continues to lead the way. Explore potential careers from a selection of top-notch employers, build your network, and master new skills through up to two years of work experience. To top it off, you’ll be earning a salary.

**HOW CO-OP WORKS**

You’ll alternate study and work terms, with most Math programs offering a variety of study and work sequences.

**WE’LL HELP YOU PREPARE**

We’ll teach you everything you need to know about finding a job that’s right for you. The Centre for Career Action is there for you every step of the way – whether you choose a co-op or regular program. We can help with everything from polishing your résumé to developing your interview skills and offering advice as you navigate your career path.

[uwaterloo.ca/co-operative-education](uwaterloo.ca/co-operative-education)

**EXPERIENCE MATTERS**

Some past co-op roles include:
› Lab support administrator
› Mobile application developer
› Project engineering support
› Process/Product software quality assurance analyst
› Technical trading associate
› Web solutions developer/technical analyst

**CO-OP OR REGULAR?**

With the exception of Mathematics/Teaching (co-op only), you can choose co-op or regular. If you haven’t decided before you apply, we recommend applying to co-op when you submit your application.
Driving Innovation

#1 in Canada for experiential learning
(Maclean’s Student Satisfaction Ranking – Comprehensive Universities 2022)

100% Yours!

Waterloo’s unique creator-owned intellectual property policy: any idea you come up with while at the University is 100% yours!
It takes a wealth of knowledge to build the vehicle of the future. Waterloo’s emphasis on innovation and interdisciplinary research gives our students a distinct advantage in the race to do it successfully.

WATonomous is a student-run design team for autonomous vehicles and students from the Faculty of Mathematics have been integral to the team’s success. They apply what they learn in the classroom to build a self-driving car and compete against other university teams.

watonomous.ca

BRING YOUR LESSONS TO LIFE
Go beyond the classroom to show the world how technical skills and creativity can overcome the toughest challenges. Our students apply their talents at events across campus and around the globe. We’re home to Hack the North, StarterHacks, WATonomous, Equithon, The Data Open, ASA DataFest, iGEM, and more. Solve real-world problems by diving into data, pushing your programming skills to the limit, or hacking to help the world. Form a squad and jump in!

EXPAND YOUR REALITY
At Waterloo, not only will you learn from researchers who are pushing boundaries, you’ll also have opportunities to participate in ground-breaking research. Consider applying for an undergraduate research award to be a part of the latest discoveries and help expand the possibilities of mathematics.

FUND YOUR INNOVATION
Each term, Velocity’s experiential innovation hub at the University of Waterloo and The Problem Lab award up to $50,000 to students with creative tech ideas. Follow in the footsteps of successful Mathies and pitch to local entrepreneurs for the chance to win a $5,000 grant or $15,000 to be used for research and development.

innovation.uwaterloo.ca
When you apply to our Honours Mathematics program, you’ll choose your major once you get here. Use your first year to figure out what kinds of math you like and where you want to focus your education so you can dive into your preferred subjects and set yourself up for your dream career.

uwaterloo.ca/math/future-programs

GURTAJ REFLECTS ABOUT HIS EXPERIENCE AS AN HONOURS MATHEMATICS STUDENT

“I enjoy that there’s so many layers to math that you don’t really learn until you get into university, and there are so many things you can do with it. Just being exposed to all the different things you can do with math makes me appreciate it a lot more.”

GURTAJ
HONOURS MATHEMATICS MAJOR, CO-OP

#1 IN CANADA
tied for first in computer science and mathematics
(Maclean's University Rankings 2022)
APPLIED MATHEMATICS

Applied Mathematics brings math to life. The program offers an understanding of the explanatory and predictive power of math. You’ll learn how to formulate and analyze mathematical models in a broad range of disciplines, so you’re prepared to tackle the intricacies and the speed of the 21st-century workplace. Use your understanding of mathematical concepts to solve complex problems in engineering, medicine, business, and science, from the behaviour of ocean waves to the structure of space-time.

COMBINATORIALS AND OPTIMIZATION

Combinatorics is the mathematics of finite structures. Optimization explores ways to make any operation work more efficiently within given constraints. Together, they provide powerful methods for modelling and solving large management problems – from optimizing flight schedules, to making a factory’s layout as efficient as possible. Study in the first department of its kind in the world and you’ll graduate with the skills to solve problems in computer science, business, communications, and more.

CAREER POSSIBILITIES:

- Research analyst
- Professor or teacher
- Operations research analyst
- Cryptographer
- IT manager
Peer into Math’s crystal ball. Solving today’s real-life financial problems requires statistics, probability, and risk theory. Actuaries address the uncertainties associated with life insurance, property and casualty insurance, annuities, and pensions or other employee benefit plans. We’ll provide you with the four basic requirements for becoming an Actuary – education, experience, strong communication skills, and assistance in the completion of a series of qualifying exams by various professional bodies.

Tiana understands the challenges of achieving a good work-life balance, and it’s a skill she’s sharing with incoming Mathies. She founded the First-Year Mentorship program, which pairs new students with mentors in upper years to provide guidance, support, and a friendly face. It was an idea inspired by her first-year mentor. “He really helped me along, not just with my academics and how to have a life. He shared some life hacks. It was incredibly helpful to me, so I wanted to make sure that more students got help in their transition from high school to university.”
Quantitative skills and statistical methods are a powerful combination and are in high demand in competitive job markets. You’ll take the same core courses as Statistics majors, with the addition of specialized upper-year courses designed specifically for Biostatistics students, including statistical methods used in health research, longitudinal studies, and spatial data analysis.

With the massive volume of data available to us daily, someone needs to make sense of it. You’ll acquire skills and learn statistical methods for designing studies and surveys, collecting and analyzing data, forecasting, mathematical modelling, and extracting meaning behind data to understand and apply the results. With this educational background, your future career possibilities are endless! You'll find our grads in a broad range of fields, including engineering, finance, health sciences, sports, and business management.
In Mathematical Optimization, you’ll learn to use analytic tools and sophisticated mathematical techniques to identify optimal solutions to complicated problems. With a strong foundation in math and computer science, combined with courses in business, economics, and management science, you’ll acquire skills that will put you in high demand and keep your options open for future success.

MATHEMATICAL PHYSICS

“Mathematical physics provides rigorous training for understanding the fundamental laws of nature, prepares you for further academic pursuits and equips you with the skills for real-world applications. You can help revolutionize the frontier of theoretical physics, unveil the mysteries of the universe, develop quantum technologies, or study and design new materials for a more sustainable future.”

Discover mathematical and theoretical underpinnings of the laws of nature, such as the foundations of quantum theory and its applications in nanotechnology, the structure of spacetime and cosmology, fluid mechanics, and atmospheric physics. Get hands-on experience in the lab and dig deep into mechanics, electricity and magnetism, computer programming, optics, and more. Learn from world-class researchers at the Institute for Quantum Computing, the Waterloo Institute for Nanotechnology, and the Perimeter Institute for Theoretical Physics.
Dominate the world of data to predict the future. Computational Mathematics teaches you to harness the power of computers to generate and run mathematical models to understand trends and find industrial-sized solutions. You’ll learn how to code mathematical models to solve problems in business, economics, engineering, environment, finance, medicine, and science. Gain your competitive edge by combining math and computer science in one degree.

Every day, 2.5 quintillion bytes of data are generated by business, scientific, and social activities. Find out how data from sensors, digital images, streaming video, satellites, medical imagery, and interactions with cloud computing is shaping our future. You’ll take courses in computer science and statistics and learn the methods used to analyze large data sets empowering you to predict trends and improve business strategy, products and services, marketing campaigns, medicine, and public health and safety.

You will have to apply to this major after your first year and entry can be competitive. Speak with your academic advisor to learn more.
MATHEMATICAL STUDIES

Choose your own adventure. If you’re looking for an education that covers the full spectrum of math courses and topics, you’re on the right track. Design a program that’s the best fit for your specific interests and choose from courses in algebra, calculus, combinatorics, computer science, number theory, statistics, and more. By graduation, your analytical, technical, and problem-solving skills will set you apart from the competition, no matter which career you choose!

MATHEMATICS/TEACHING

CO-OP ONLY

Inspire future generations and share your passion for mathematics. You’ll get paid classroom experience to prepare you for a Bachelor of Education (BEd) program in Canada and spend at least two work terms in the classroom.

Open to all co-op students in Honours Mathematics, you can apply to the program as a major in your second year. Choose a second teachable subject from the Arts or Sciences to keep your options open and follow your non-math passions. By the time you graduate, you’ll be ready to pursue a Bachelor of Education to teach at the intermediate/senior level.
Go beyond the basics and find the answers to the “how” and “why” behind the mathematics. Pure Mathematics is the foundation of all mathematical reasoning. If first-year calculus teaches you how to drive a car, Pure Mathematics teaches you how to build one! You can use this program as a springboard into a career in information technology, finance, business, science, education, or insurance, or go on to graduate studies at some of the world’s most prestigious universities.

Josué knew that Waterloo was the right place for him to grow his knowledge of cryptography and fuel his passion for math.

“You need to have the right drive where you really want to do something. But you also need to be in the right environment for it too. Waterloo was the perfect environment for me, because having so much math available makes you want to learn more about it. There are so many times where I’m genuinely blown away by what I see.”

CAREER POSSIBILITIES:
- Operations or data analyst
- Research and academia
- Computer scientist
Economics is often expressed in mathematical models, and most branches of economics use mathematical, statistical, and computational concepts extensively. We’ve also seen many advances in mathematics motivated by economic problems. Get the best of both worlds in the Mathematical Economics program, offered jointly by the Faculty of Mathematics and the Department of Economics in the Faculty of Arts. Emphasizing economic theory, this interdisciplinary program uses quantitative methods to understand and represent economic theories and apply them to solve complex problems found in a wide range of economic systems.

Mathematical Finance is an elite program designed for students with outstanding mathematical skills who want a career in high-level quantitative finance. At one of the most advanced undergraduate finance programs, you’ll take courses in corporate finance, quantitative risk management, mathematical analysis, and statistical forecasting. The program provides solid mathematical training and a modern understanding of financial markets. These skills will prepare you for the world’s best graduate programs in quantitative finance and job opportunities in banking and finance.
A Bachelor of Mathematics (BMath) degree from the University of Waterloo is your path to almost any career you can think of. Our strengths in mathematics, statistics, and computer science give graduates a competitive edge in some of these profitable industries:

› Health and medical technology
› Data science
› Artificial intelligence and machine learning
› Cybersecurity and privacy
› Business and financial technology

What can you do with a degree in math?

96% of graduates employed within two years (2018 cohort)

70% of top jobs start with a degree in Math (careercast.com)
COMMUNITY

Your university experience is more than just schoolwork, and with more than 200 clubs and student groups on campus, you’ll have ample opportunity to build your network, meet like-minded students, and discover brand-new passions!

“Hobby clubs are a great way to get involved on campus. I enjoyed learning Bachata in the Student Life Centre, getting to meet new people, and forcing myself outside my comfort zone.”

“Orientation Week is one of the most blissful parts of first year. While not in the itinerary, getting lost around campus, meeting new people, and sporadic games nights all frequently occurred. The real value of Orientation was the social aspect to meet new people from other programs and faculties.”

“Not only did going to the gym help maintain my health, it also helped me beat some of the stress and take my mind off a lot of the work. It helps me get a clear head afterward.”

“I love participating in Waterloo Women’s Impact Network events. It’s a wonderfully supportive community that discusses current topics and holds interesting talks for the network. I encourage every woman in math, and allies, to attend an event or become a member to see themselves represented and hear inspiring stories. Representation matters.”
“It’s really special to be a part of a group of people who are like me and are passionate about math and computer science in the same way I am.”

“The Math CnD is the quickest place to grab a bite before or after class, chat with friends, or get some work done! It does get busy during lunch hours, but it has some of the greatest selections of food and snacks on campus.”

“What sets Waterloo apart is the focus not only on application, but also the theoretical skills needed to succeed. We’re encouraged to approach problems by understanding the theory behind them.”

“Waterloo really gives you all the opportunities. You want to learn, you want to create something, you want to do something – there is always a resource out there for you.”

“MathSoc hands out about 1,400 slices of pie on Pi Day. That is a heck of a lot of pie! It’s a fun event to volunteer at because you get to meet so many math students excited to celebrate.”
HOW TO APPLY

1. Apply online and pay fees through the Ontario Universities’ Application Centre (OUAC).
2. Watch for an acknowledgment email with your next steps and Waterloo ID number.
3. Submit any additional required documents, including your AIF, before the deadline.
4. Accept your Offer of Admission through OUAC and submit your Residence Guarantee Application Form and deposit.

AN ADMISSION INFORMATION FORM IS REQUIRED FOR ADMISSION!

Your Admission Information Form (AIF) is submitted through Quest after you complete your OUAC application. It includes questions about your extracurriculars and work experience. It’s your opportunity to tell us what makes you a unique and well-rounded student, and helps us make admissions decisions.

2023 REQUIREMENTS

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>MAJORS available beginning second year*</th>
<th>REQUIRED COURSES</th>
<th>ADMISSION AVERAGE (includes required courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actuarial Science, Applied Mathematics, Biostatistics, Combinatorics and Optimization, Computational Mathematics, Data Science, Mathematical Economics, Mathematical Finance, Mathematical Optimization, Mathematical Physics, Mathematical Studies, Mathematics/Teaching (co-op only) Pure Mathematics, Statistics</td>
<td>Advanced Functions, Calculus and Vectors, any 12 U English, one other Grade 12 U course, Admission Information Form</td>
<td>Individual selection* from the high 80s</td>
</tr>
<tr>
<td>Mathematics Regular/co-op</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*TIndividually selected refers to content submitted on the AIF. Admission decisions are strongly based on academic performance, but extracurricular activities listed in the AIF and a good contest score (if applicable) are also taken into consideration.

IT’S WORTH THE WAIT!

In an effort to base our decisions on the most relevant grades possible, most admissions offers are made in mid-May. We base our final decisions on your interim or final grades in your admission average and your AIF. In some cases, a strong score on the CSMC, CCC, and/or Euclid contest can also help improve your chances of admission.

› Show us how you’re involved in activities outside of the classroom and in your community
› Demonstrate your ability to manage multiple activities and priorities while performing at a high level
› Use the “Additional Information” fields on your AIF to highlight what’s special or different about your extracurriculars, awards, and/or employment
› Strongly consider writing our Euclid Math Contest, Canadian Senior Math Contest, and/or Canadian Computing Competition
If English is not your first language and your four most recent years of full-time education have not been taught in English, you’ll be required to submit one of these English language test scores.

<table>
<thead>
<tr>
<th>Internet-based TOEFL</th>
<th>IELTS</th>
<th>CAEL</th>
<th>PTE (academic)</th>
<th>Duolingo</th>
<th>Cambridge Assessment (01 or 02)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 overall; 25 writing; 25 speaking</td>
<td>6.5 overall; 6.5 writing; 6.0 speaking; 6.0 listening</td>
<td>70 overall; 60 per band; 70 writing; 70 speaking</td>
<td>63 overall; 65 writing; 65 speaking</td>
<td>120 overall; 176 writing; 176 speaking</td>
<td>180 overall; 176 writing; 176 speaking</td>
</tr>
</tbody>
</table>

Get deadlines and other details:

uwaterloo.ca/future/elr

CONTESTS

Get contest preparation resources, registration details, and deadlines:

cemc.uwaterloo.ca

EUCLID MATHEMATICS CONTEST

While the Euclid Mathematics Contest is not required for admission, your participation is strongly encouraged and is an asset to your application. You must participate in the Euclid Contest or CSMC to be considered for a Math entrance scholarship. The contest will be written in your high school in early April 2023.

CANADIAN SENIOR MATHEMATICS CONTEST (CSMC)

While the CSMC is not required for admission, your participation is strongly encouraged and is an asset to your application. You must participate in the CSMC or Euclid Contest to be considered for a Math entrance scholarship. The contest will be written in your high school in mid-November 2022.

CANADIAN COMPUTING COMPETITION (CCC)

The CCC is not required for admission, but a high score may be an asset for admission to David R. Cheriton School of Computer Science programs. The CCC will be written in mid-February 2023.

FINANCING YOUR EDUCATION

When thinking about university, it’s important to prepare a realistic budget for your first eight months (two terms).

› List your financial needs: tuition and other student fees, residence fees, books, supplies, and living expenses. uwaterloo.ca/future/financing

› List the financial resources available to fund your education: savings, RESP, and co-op earnings (if applicable).

› If you’re eligible, augment your resources with scholarships, provincial financial aid (such as the Ontario Student Assistance Program), and a Waterloo Entrance Bursary.

› You pay only four months (one term) at a time.

› Participate in contests and apply for entrance scholarships.

ENTRANCE SCHOLARSHIPS

<table>
<thead>
<tr>
<th>SCHOLARSHIPS</th>
<th>VALUE</th>
<th>REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>President’s and Merit Scholarships</td>
<td>Scholarships ranging in value from $1,000 to $5,000 - awarded to all students who meet marks criteria</td>
<td>Based on marks: 85-89.9% – $1,000 90-94.9% – $2,000 ≥95% – $2,000+ (up to $5,000*)</td>
</tr>
<tr>
<td>Faculty of Mathematics Scholarships</td>
<td>Scholarships ranging in value from $10,000 to $50,000</td>
<td>Based on application, high academic performance, and outstanding extracurricular achievements</td>
</tr>
<tr>
<td>Faculty of Mathematics Entrance Scholarships</td>
<td>200 scholarships ranging in value from $1,000 to $40,000</td>
<td>Based on marks, AIF, Euclid Contest, and/or CSMC score</td>
</tr>
</tbody>
</table>

*Entrance scholarship plus $1,500 International Experience Award and/or $1,500 Research Award. International Experience and Research Awards are available in upper years, should you choose to claim them. Students must complete their first-year courses with an 80% average.

uwaterloo.ca/future/scholarships
The University of Waterloo acknowledges that much of our work takes place on the traditional territory of the Neutral, Anishinaabeg, and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River.

Our greatest impact happens together