ideas start here®

cheriton school of computer science

Faculty of Mathematics
develop you
The David R. Cheriton School of Computer Science has grown to become the largest academic computer science research centre in Canada. Here you are in charge of your ideas. With 16 research areas and deep connections to Canada’s growing tech sector, you’ll have the chance to help uncover the newest research and venture out on your own entrepreneurial adventure while working alongside leading experts.

our programs

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what’s inside

PAGE 3 Choose your studies
Discover the possibilities in your course selection

PAGE 9 Show your spirit
Get involved in clubs, research, and competitions

PAGE 10 Get paid to work!
Build your résumé by working with top technology companies
When you choose the David R. Cheriton School of Computer Science, you’re choosing to study and work with inspiring thinkers at the world’s largest centre for mathematics and computer science. Over 2,800 undergraduate students are enrolled full-time in our programs, learning from our award-winning faculty.

Our world-class reputation
Computer Science programs at Waterloo have an international reputation for leadership and innovation in research and education. Ranked 26th in the world by the QS World University Rankings, for performance in computer science, Waterloo is the place to develop your knowledge and launch your career.

Education at its best
During your studies, you’ll choose from a large variety of courses, combined programs, and options to broaden your understanding of the science of computing. You’ll learn the theory, practice, and application of computer science to help solve today’s pervasive problems and effectively change the world.

ONLY CANADIAN UNIVERSITY to win the world ACM programming contest, twice!

ACCREDITED by The Computer Science Accreditation Council of the Canadian Information Processing Society (CIPS)

First-year core courses
» Introductory Computer Science courses
» Algebra
» Calculus
» Communication courses
You can choose versions of these courses to suit your level of experience.
Explore these areas through course choices in your upper years of study.

» **Algorithms and Complexity**  
Develop and study the methods behind fast searching, scheduling, and efficient data representation and manipulation.

» **Artificial Intelligence**  
Gain theoretical and experimental knowledge of what makes computers able to act “intelligently.”

» **Bioinformatics**  
Apply the latest computer science developments to biological data.

» **Symbolic Computation**  
Use the power of computers to solve important mathematical problems.

» **Computer Graphics**  
Explore visual perception as you learn to create 3D imagery for entertainment and scientific visualization.

» **Cryptography, Security, Privacy**  
Protect internet users against a range of threats, while maintaining privacy and usability.

» **Data Systems**  
Model, store, manage, search, and retrieve large collections of structured and unstructured data.

» **Formal Methods**  
Use mathematical modeling and analysis to prevent errors during development processes.

» **Health Informatics**  
Apply computer science to enhance the delivery of health care.

» **Human Computer Interaction**  
Combine psychology, physiology, and design principles to improve computer usability.

» **Machine Learning**  
Understand and develop systems that use data to learn how to make predictions and decisions.

» **Programming Languages**  
Design, implement, and execute computer languages.

» **Quantum Computing**  
Design, study, and analyze algorithms for quantum computers.

» **Scientific Computing**  
Develop fast and accurate numerical software for scientific, engineering, medical, and financial applications.

» **Software Engineering**  
Build practical software for the real world.

» **Systems and Networking**  
Develop software and techniques for today’s and tomorrow’s distributed and cloud computing environments.
computer science
Bachelor of Computer Science (BCS)

What is Computer Science?
Using a combination of theory, practice, and application, you'll develop a broad understanding of computer science in areas including systems, and networks, algorithms, and software engineering, with the opportunity to explore other more in-depth areas of study.

What you get out of the program
Learn how to effectively solve real-world problems by applying mathematical and computer science skills in efficient and effective ways. Waterloo graduates can apply their broad and deep knowledge to many areas of computer science to provide solutions to a wide variety of fields.

Customize your degree
Design your own interdisciplinary program by choosing from one of our pre-tailored options below.

» Bioinformatics option: Learn how to solve important biological problems by applying large-scale computation and analysis to biological data.

» Business option: Understand the world of business with courses in accounting, marketing, economics, and management sciences. Or enhance your knowledge with a full degree in business (see page 6) or in finance and accounting (see page 7).

» Computational Fine Art option: Learn about art history, theory, and studio practice with a focus on applying your computer science skills to create computational works of art.

» Digital Hardware option: Learn more about the electrical engineering aspects of computer systems.

» Health Informatics option: Develop your skills in the health sector with courses that offer you a broad coverage of health studies, research methods, and business information systems.

» Human Computer Interaction option: Learn how people interact with computers and computational systems, and learn how to design and build systems that improve these interactions.

» Software Engineering option: Work in a dynamic team over 3 courses to build a project involving all stages of the software development life cycle. Or get more project experience with a Bachelor of Software Engineering (see page 5).

Speak with an advisor in your second year to find out how to include an option with your studies.

Women in Computer Science (WICS) supports the success of women in Computer Science at Waterloo. Technical presentations, workshops, and professional development provide enrichment opportunities for students to improve their knowledge and skills. The BigCSters Mentorship Program runs informal get-togethers where upper-year students pass on advice, pointers, and personal experiences to first-year students. Events also include a speaker series, career panels, problem-solving sessions, and more. The overall goal is to foster a community and strong support network among the female students.
software engineering

Bachelor of Software Engineering (BSE)

What is Software Engineering?

Software Engineering applies computer science and engineering principles and practices to design, create, and maintain computer software. In a world where new technologies are developed every minute, software engineers are in demand for their ability to make software more affordable, faster to build, and easier to maintain.

What you get out of the program

You’ll instantly experience the benefits of Waterloo’s program, which combines the university’s strengths in computer science and computer engineering. You’ll study courses in the Cheriton School of Computer Science and the Faculty of Engineering. Through project-intensive classes and co-op, you’ll learn to develop complex software systems that ensure the reliability, performance, and usability demanded by today’s industrial and business applications. You’ll gain skills in communication, business, and reasoning and benefit from our focus on teamwork and collaboration.

What’s the difference?

Find your fit between software engineering and computer science.

Software Engineering cohort

You’ll share all of your required courses and co-op terms with your classmates throughout your university career. Build study groups, future business partnerships, and friendships.

The Entrepreneurship option

Explore entrepreneurship by taking courses to combine your technical background with business knowledge and skills. This option is only available to Software Engineering students. uwaterloo.ca/conrad-business-entrepreneurship-technology

Waterloo’s Software Engineering program has dual accreditation by the Canadian Engineering Accreditation Board and the Computer Science Accreditation Council.
business administration and computer science double degree

Bachelor of Business Administration (BBA)/Bachelor of Computer Science (BCS)

What is the BBA/BCS program?
With this exclusively co-op program you'll get both a full honours computer science degree (BCS) from Waterloo and a full honours business administration degree (BBA) from Wilfrid Laurier University.

What you get out of the program
Graduates of this program will meet the demands of today's information-rich society with both computer science and business administration knowledge.

What you'll learn

<table>
<thead>
<tr>
<th>COMPUTER SCIENCE (WATERLOO)</th>
<th>BUSINESS ADMINISTRATION (WILFRID LAURIER)</th>
</tr>
</thead>
<tbody>
<tr>
<td>fundamental mathematics</td>
<td>accounting</td>
</tr>
<tr>
<td>computer programming</td>
<td>marketing</td>
</tr>
<tr>
<td>data structures</td>
<td>organizational behaviour</td>
</tr>
<tr>
<td>algorithms</td>
<td>modes of business communication</td>
</tr>
<tr>
<td>computer organization</td>
<td>law</td>
</tr>
<tr>
<td>software engineering</td>
<td>human resource management</td>
</tr>
<tr>
<td>operating systems</td>
<td>business policy</td>
</tr>
<tr>
<td>social implications of computing</td>
<td>operations</td>
</tr>
</tbody>
</table>

Where to apply
We recommend that you apply to both Waterloo and Laurier to maximize your chances of admission. The academic programs are identical, regardless of which university you call home.
computing and financial management

Bachelor of Computing and Financial Management (BCFM)

What is Computing and Financial Management?

In CFM, you’ll develop expertise in both computer science (using technology to solve real-world problems) and finance (the science of managing money). The financial industry needs professionals who understand complicated business and financial management concepts and know how to design and create the software tools that get the job done. Know both and you’ll be in demand.

What you get out of the program

If you’re thinking of a career in computer science but looking for that competitive edge, CFM can help you stand out in the marketplace. Combine your knowledge of finance and computer science with 6 co-op work terms and you’ll have the know-how, the networks, and the professional experience to become a future leader in the information technology or financial industry.

Priya continues to set herself apart in the marketplace. Her expertise and versatility have enabled her to navigate opportunities in computer science, through hackathons and co-op work terms at Microsoft and Google. She has also explored finance and business as a Director for the hEDGE Finance Conference, a multi-day capital markets conference. CFM and strong networking skills have taken Priya around the world: Canada, the United States, the United Kingdom, and Australia.

GO GLOBAL

Globalize your education through an international exchange. CFM students have studied in Singapore, China, and the United Kingdom.

Or build your global network and experiences by taking a co-op work term outside of Canada. CFM students have worked in cities such as New York, Seattle, San Francisco, and Amsterdam.

PROFESSIONAL RECOGNITION

CFM is accredited by CIPS, Canada’s Association of IT Professionals, and is a member of the CFA University Recognition Program.

What is Computing and Financial Management?

In CFM, you’ll develop expertise in both computer science (using technology to solve real-world problems) and finance (the science of managing money). The financial industry needs professionals who understand complicated business and financial management concepts and know how to design and create the software tools that get the job done. Know both and you’ll be in demand.

What you get out of the program

If you’re thinking of a career in computer science but looking for that competitive edge, CFM can help you stand out in the marketplace. Combine your knowledge of finance and computer science with 6 co-op work terms and you’ll have the know-how, the networks, and the professional experience to become a future leader in the information technology or financial industry.

A balanced education

36 courses
- 18 from Math (including the School of Computer Science) - with strong emphasis in computer science, mathematics, and statistics
- 18 from Arts (including the School of Accounting and Finance) - with strong emphasis in finance, accounting, and economics
- 4 electives

Find a full listing of CFM courses at uwaterloo.ca/cfm/courses
entrepreneurship and innovation

Whether you’re an innovator, inventor, or idea-maker, Waterloo can help get your ideas off the ground in more ways than one!

The Enterprise Co-op program

Put an entrepreneurial spin on your co-op experience by enrolling in the Enterprise Co-op (E Co-op) program offered by the Conrad Business, Entrepreneurship, and Technology Centre. Earn your co-op credit while growing your business ideas. ecoop.uwaterloo.ca

Velocity

Gain access to a learning-focused community of mentors, like-minded peers, the latest equipment, and the resources to turn your business ideas into successful startups. If you don’t have an idea but are willing to learn, we can help with that too!

You’ll have the choice to live in our innovative residence (or dormcubator), grow your company in our Velocity Garage, attend brainstorming sessions with Velocity Alpha, or apply for one of our many venture funds. velocity.uwaterloo.ca

Minor in Entrepreneurship

Take courses designed to equip you with the business skills and domain-specific knowledge you need to pursue your entrepreneurial ambitions and create your own venture project. Depending on your interests, you will pursue either the venture creation track or the corporate entrepreneurship track. Only Software Engineering students are eligible to enroll in the Entrepreneurship Option (page 5). uwaterloo.ca/conrad/ent-minor

Computer Science alumnus Danny Yaroslavski used E Co-op to explore his idea for Lightbot – a program that teaches children to code through gaming. After fine tuning his business idea through the program, Danny competed in the Velocity Fund Finals and walked away with $25,000 and a spot on the 2015 Forbes 30 under 30 list. Now, more than five million children are getting their first taste of coding through Lightbot.

The University of Waterloo is a stand out among other competing schools for generating new startup ideas.

— SAM ALTMAN, CEO AND FOUNDER OF Y COMBINATOR

over 1,800 STARTUPS located in Waterloo Region
over $190 million total funds raised by VELOCITY COMPANIES
If there's one thing that Kamil loves doing more than acing one of his computer science projects, it's acing his opponents out on the court for the Waterloo Varsity Tennis team. It's more than just a hobby – it's a way of life. Ever since elementary school, it's been Kamil's dream to play competitively for the university. In his third year at Waterloo, he tried out for the team and made the cut. He quickly learned to manage his time, fitting in 4 hours of practice a day and additional hours for weekend travel to compete.

On his days off, Kamil is still required to attend all of his classes and finish his assignments. “You'll burn out if you don't find things to do outside of school,” he said. “It’s tricky to manage that balance sometimes, but I find that I study a lot better when I’m physically active.” It’s a tough juggling act being both a student and a competitive athlete, but Kamil is at his best this way.

The university experience at Waterloo is more than just academics. It’s about getting involved and meeting new friends.

Clubs and activities
Give your social life a boost by getting involved in clubs and events on campus. There are a number of interest groups available to suit your needs.

» Big CSters Mentorship Program
» Computer Science Club (CS Club)
» Double Degree Club (DDC)
» MathNews
» Humans vs. Zombies
» Math Society (MathSoc)
» Women in Computer Science Undergraduate Committee (WICS)

Learn how to start your own club at feds.ca.

International exchange
Explore new worlds and cultures in your third year of study by completing your courses abroad. There are over 100 universities across the globe that you can choose from to internationalize your studies.

» Math in Europe
  Spend a school term in Europe while completing your mathematics courses. All classes are taught by Waterloo mathematics professors.

Competitions
Join the ranks of the computer science elite by participating in the ACM Programming Contest. You’ll solve timed computing problems in a team of 3 to show your merit against other top competing schools. Waterloo is the only Canadian university to win this international competition - twice!

Undergraduate Research Assistantship (URA)
Learn the ins and outs of computer science research by collaborating with our award-winning faculty. Grow your experience part-time while you study or take the term as a co-op student to develop your skills. Build your résumé for graduate studies. cs.uwaterloo.ca/ura

Sports and intramurals
Stay active during your studies by participating in an organized sport. Register as an individual or join a team.
paid work experience from the world’s best co-op program

All about co-op
» Get up to 2 years of paid work experience.
» Make career contacts that can take you places after graduation.
» Explore different career options and see what career fits you.
» Travel to different cities and meet interesting people.
» Choose from the world’s largest selection of co-op jobs.

Co-op only programs
» Business Administration and Computer Science Double Degree
» Computing and Financial Management
» Software Engineering

Co-op or regular programs
» Computer Science

Co-op sequences

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>F M S</td>
<td>F M S</td>
<td>F M S</td>
<td>F M S</td>
<td>F M S</td>
</tr>
<tr>
<td>Sequence 1</td>
<td>Study</td>
<td>Study</td>
<td>Work</td>
<td>Study</td>
</tr>
<tr>
<td>Sequence 2</td>
<td>Study</td>
<td>Study</td>
<td>Work</td>
<td>Study</td>
</tr>
<tr>
<td>Sequence 3</td>
<td>Study</td>
<td>Study</td>
<td>Off</td>
<td>Study</td>
</tr>
<tr>
<td>Sequence 4</td>
<td>Study</td>
<td>Study</td>
<td>Off</td>
<td>Study</td>
</tr>
<tr>
<td>Regular</td>
<td>Study</td>
<td>Study</td>
<td>Off</td>
<td>Study</td>
</tr>
</tbody>
</table>

F = fall term (September to December); W = winter term (January to April); S = spring term (May to August)

Computer Science – Sequence 1, 2, 3, 4, or regular
Computing and Financial Management – Sequence 1 only
Software Engineering – Sequence 1 only

94% CO-OP employment rate
potential earnings over 6 work terms = $50,000-$120,000

77% of Computer Science students are in co-op

Students at the University of Waterloo are incredibly unique, completing up to 6 co-op terms in real companies with real responsibilities. They graduate knowing how companies work, how teams operate and how to add value, able to hit the ground running unlike almost any other students in the world.

TED LIVINGSTON, FOUNDER & CEO, KIK INTERACTIVE
Our graduates are making a large impact in various roles and companies all over the world. Find out where an education at Waterloo can take you.

Sample jobs
- Game Developer, Digital Extremes Ltd.
- Associate Development Manager, Electronic Arts
- Technical Director, Pixar Animation Studios
- Product Manager, Google
- Business Analyst, Yahoo!
- Software Developer, Agfa HealthCare
- Professor, Stanford University
- Web Product Manager, OpenText Corporation
- Research Coordinator, United Arab Emirates University

8,872
Computer Science
ALUMNI
graduates from
90
COUNTRIES
around the world

1,000
TECH JOBS
number of available positions in the Waterloo Region

Walk down the hallway at Microsoft or Google and you will find as many Waterloo grads as those from MIT, Stanford, or Berkeley. Waterloo graduates are commanding salaries as high as the very best American grads.

- ACM Magazine

Going to Waterloo is one of the best decisions I ever made. Working in the Bay area, it’s amazing to see the kind of reputation we have out here. Often, Waterloo is the only Canadian school companies hire from, making my degree from Waterloo incredibly valuable.

- Anna Menkoulovitch, Technical Staff, Cisco Meraki
  BSc Alumni ’13, Bioinformatics and Co-op Option

Waterloo is different. It’s got this amazing university which has long been one of our top three recruiting universities for Google as a whole, worldwide. Waterloo grads do well at Google, they do very well.

- Steven Woods, Director of Engineering, Google
Mary is a Business Administration and Computer Science student at Waterloo. Since elementary school, Mary has been interested in the arts, trying a range of different techniques including watercolour painting, oil painting, sketching, and pen drawing. Her interests in computer science, business, and art may appear unconventional, but her range of skills from each of these areas is what makes her a well-rounded student for her program.

admission information form

An Admission Information Form (AIF) is required with your application.

When we make our admissions decisions, we aim to admit the most well-rounded students who excel in both their academics and extra-curricular activities. Tell us what makes you special by using our form. We will review and grade every AIF to help your application.

Let us know what makes you unique. Include your:

- volunteer and work experience
- participation in clubs or associations
- personal projects (e.g., mobile apps, website, game development)
- involvement in computing, math, or other competitions
- awards and accomplishments
admissions

what courses do you need to apply?

Required courses for Ontario high school students

<table>
<thead>
<tr>
<th>PROGRAM (APPLY TO)/SYSTEM OF STUDY</th>
<th>REQUIRED COURSES - GRADE 12 U UNLESS OTHERWISE SPECIFIED, MINIMUM REQUIREMENTS: 6 GRADE 12 U OR M COURSES, INCLUDING ALL REQUIRED COURSES.</th>
<th>ADMISSION AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Administration (Laurier) and Computer Science (Waterloo) Co-op</td>
<td>Advanced Functions, Calculus and Vectors, any 12U English, one other Grade 12 U course</td>
<td>Individual selection from the low 90s</td>
</tr>
<tr>
<td>Computer Science Regular/Co-op</td>
<td>Advanced Functions, Calculus and Vectors, any 12U English, one other Grade 12 U course</td>
<td>Individual selection from the low 90s</td>
</tr>
<tr>
<td>Computing and Financial Management Co-op</td>
<td>Advanced Functions, Calculus and Vectors, any 12U English (min 75%), one other Grade 12 U course</td>
<td>Individual selection from the low 90s</td>
</tr>
<tr>
<td>Software Engineering Co-op</td>
<td>Advanced Functions (min 70%), Calculus and Vectors (min 70%), Chemistry (min 70%), English (min 70%), Physics (min 70%) Experience in developing well-structured modular programs is also required</td>
<td>Individual selection from the low 90s</td>
</tr>
</tbody>
</table>

NOTES:
» 1. Min = minimum
» 2. For international and provincial requirements, visit uwaterloo.ca/findoutmore/admissions.
» 3. If you’re not offered admission to the program of your choice, you may be considered for other Mathematics programs.

math and computing contests

Participate for scholarship consideration and enrichment activities. Contests are not required for admission.

**Canadian Computing Competition (CCC)**
Test your ability in designing, understanding, and implementing algorithms. A high score may be an asset to admission to the Cheriton School of Computer Science. The CCC will be written on February 22, 2017.

**Euclid Mathematics Contest**
Develop your mathematical problem-solving ability. The Euclid Math Contest is required for all Faculty of Mathematics scholarships. This contest will be written on April 6, 2017.

Contest preparation resources, registration details, and deadlines: cemc.uwaterloo.ca

English language requirements

If English is not your first language and your most recent years of full-time education have not been taught in English, you’ll be required to submit an English language test score.

Visit uwaterloo.ca/findoutmore/elr for eligible tests, deadlines, and where to send your results.

Math/English Language for Academic Studies (Math/ELAS)

If you need additional training to meet our English language requirements, you may receive an alternative offer of admission to Math/ELAS if you have strong marks in your academics. Find out more: uwaterloo.ca/math/elas

entrance scholarships

<table>
<thead>
<tr>
<th>Scholarship Type</th>
<th>Details</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>President’s and Merit Scholarships</td>
<td>No application</td>
<td>Unlimited number of scholarships ranging in value from $1,000-$5,000</td>
</tr>
<tr>
<td>Faculty of Mathematics Scholarships</td>
<td>Application deadline: February 6, 2017</td>
<td>13 scholarships ranging in value from $12,000-$25,000</td>
</tr>
<tr>
<td>Faculty of Mathematics Entrance Scholarships</td>
<td>No application; must write Euclid Contest</td>
<td>150 scholarships ranging in value from $2,000-$10,000</td>
</tr>
</tbody>
</table>
CONTACT US

RECRUITMENT OFFICE
David R. Cheriton School of Computer Science
519-888-4567, ext. 35144
future-ugrad@cs.uwaterloo.ca
cs.uwaterloo.ca

JORDYN GRAY-MCINNIS
Program Manager
Computing and Financial Management
519-888-4567, ext. 37033
cfm@uwaterloo.ca
uwaterloo.ca/cfm

Important dates for September 2017 admission

February 6, 2017
Deadline for Faculty of Mathematics Scholarship Application

February 22, 2017
Canadian Computing Competition

April 6, 2017
Euclid Mathematics Contest

COME FOR A VISIT

Fall Open House
November 5, 2016

March Break Open House
March 18, 2017

ORDER A BROCHURE
Choose from 21 admissions brochures at uwaterloo.ca/findoutmore/order

University of Waterloo
200 University Avenue West
Waterloo, Ontario, Canada  N2L 3G1