2016

FACULTY OF ENGINEERING

engineering.uOttawa.ca

PROGRAM GUIDE

uOttawa

STUDENT
STORIES

ADRIAN PAWLISZKO
Fourth year, Civil Engineering, Computing Technology Option

BRIAN PERRY
Fourth year, Civil Engineering, Environmental and Water Resources Option

In the spring of 2015, we decided to take part in AquaHacking, an initiative focused on finding solutions for problems related to the Ottawa River.

Over the weeks this initiative ran, we built a Web application called My River / Ma rivière, to address the lack of options for reporting, resolving and collaborating on issues related to water. This application allows citizens to report qualitative water issues—oil sheens, fish kills, cloudiness, etc.—they observe in any location. A notice is subsequently sent directly to the authority responsible for the issue, whether a municipality, conservation authority or government agency. With access to a dashboard in the application, staff at the authority can collaborate with any other municipalities along the watershed in question to address or solve the issue. During this entire process, the individual who submitted the issue and the public are able to follow the progress being made.

Participating in AquaHacking allowed us to successfully combine both our specialties (environmental and water resources and computing technology) to create a winning application. We're excited to be able to work alongside the various stakeholders involved in the Ottawa River to bring our application to municipalities along the watershed and beyond.

Photo credit: The de Gaspé Beaubien Foundation

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KEEP IN TOUCH

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Twitter.com/ uOttawaGenie

Youtube.com/ FacultyofEngineering

STUDY
IN THE NATIONAL CAPITAL REGION

OTTAWA IS A GREAT PLACE WHERE...

★ = ⚙ + ▶ + 📊
TALENT = WORK + PLAY + GROW

WORK
- **1,900 +** knowledge-based companies across all sectors
- Ottawa offers access to a community of businesspeople, researchers and scholars, government officials and politicians as well as strong infrastructure support for applied research.
- **1,500 +** high tech companies with less than 50 employees
- **44** Federal research labs to help test and commercialize your idea
- **$6.2B** spent annually by Federal research labs
- **1.2M** Population of Ottawa

PLAY
- **7** Ski resorts
- **Top 5** – Home to one of the top five white water rafting spots in the world
- **600** kilometers of bike paths
- **150 +** kilometers of cross-country ski trails
- **7.8** kilometers of the world's largest skating rink, the Rideau Canal, Ottawa's very own UNESCO World Heritage Site
- **247** community skating rinks
- **14** national museums and 13 art galleries
- **90 +** annual festivals – Ontario's best large city for festivals, according to FEOntario
- **3** public supervised beaches
- **3** professional sports teams

GROW
- **# 2** in quality of life for large cities in North America, **#14** in the world *(source: www.mercer.com)*
- **# 1** most sustainable city in Canada, third in North America *(source: www.corporateknights.com)*
- Ottawa is the least expensive Canadian city included in the Mercer rankings *(Source: Mercer, Worldwide cost of living survey 2012 – city ranking)*

TALENT
- **#1** Most educated workforce in Canada
- **Over 75,000** employees in knowledge-based companies across all sectors
- **# 1** Highest concentration of scientists and engineers in Canada
- **# 2** Second out of 316 North American cities for highest concentration of scientists and engineers
- **44%** of the population is bilingual
- The region is recognized for excellence in research and innovation

Source: Invest Ottawa

LIVE
The **University of Ottawa campus** is located in the National Capital Region, rated second among the best places to live in Canada.

— MoneySense magazine, 2015

uOttawa campus

Faculty of Engineering

🏛 uOttawa

W H Y

WHY CHOOSE THE UOTTAWA FACULTY OF ENGINEERING

The **FACULTY OF ENGINEERING** at the University of Ottawa provides you with a strong foundation to build a successful and rewarding career.

CHOOSE FROM

8

UNDERGRADUATE PROGRAMS

GET EXCELLENT QUALITY PROGRAMS

Choose from eight accredited undergraduate programs, each offering top quality education in engineering and computer science. Not only will you be well prepared to practice your profession, but you will also be more than able to meet the ever-changing needs of society.

PROFESSIONAL ACCREDITATIONS

CIPS

www.cips.ca
The Honours BSc in Computer Science and the BASc in Software Engineering are accredited by the Computer Science Accreditation Council of CIPS

engineerscanada / ingénieurscanada

www.engineerscanada.ca / www.ingenieurscanada.ca
All Engineering programs are accredited by the Canadian Engineering Accreditation Board of Engineers Canada

CUSTOMIZE YOUR DEGREE WITH VARIOUS OPTIONS

Through a number of options, you will acquire the skills you need to better prepare you for the many challenges and opportunities you will face in today's—and tomorrow's—job market.

- Engineering Management and Entrepreneurship
- Computing Technology
- Cooperative Education
- Double Degree programs
- Power and Sustainable Energy
- And many more

STUDY IN A BILINGUAL ENVIRONMENT

Enroll in the only engineering school in the country where you can choose to study in English, in French, or in both languages!

IMPROVE YOUR FRENCH-LANGUAGE SKILLS AND GAIN A CLEAR ADVANTAGE IN THE WORKPLACE

The Extended French Stream (EFS), which is available in both Software Engineering and Computer Science programs, allows you to take one third of your courses in French. You choose which courses you take in French and which you take in English. If you choose to take a minimum number of French courses, you could qualify for an annual $1000 French Studies bursary.

GET INVOLVED IN EXTRACURRICULAR ACTIVITIES

As a Faculty of Engineering student, you can participate in a variety of educational, extracurricular and pre-professional activities. The Faculty supports and encourages students to part take in such activities and offers two fast prototyping facilities: the Makerspace and the Brunsfield Group Engineering Student Projects and Entrepreneurship Centre. More details on page 11.

LIVE IN A MULTICULTURAL COMMUNITY OF STUDENTS AND STAFF

Enrich your learning experience by meeting students from all over the world. In 2014-2015, almost 2,000 of the Faculty's over 5,000 undergraduate and graduate students were from outside Canada.

Learn from professors who have gained their knowledge around the world: professors at the Faculty of Engineering have lived, studied or worked in over 40 different countries.

LEARN FROM EXPERTS

As an engineering or computer science student, you will be studying with leading researchers in their fields. In everything from photonics to web security, our professors are making world-changing discoveries.

FINANCE YOUR EDUCATION THROUGH OUR GENEROUS SCHOLARSHIP AND BURSARY PROGRAM

The University of Ottawa has one of Canada's leading scholarship and bursary programs, with over $22.5M awarded to undergraduate students this year and $25M to graduate students. In addition to the generous University program, engineering and computer science students have access to a wide range of admission scholarships offered by the Faculty of Engineering. More details on page 8.

ENTREPRENEURSHIP

DEVELOP YOUR ENTREPRENEURIAL SPIRIT

One of the main goals of the Faculty and the University of Ottawa's Entrepreneurship Hub is to foster a culture of business and entrepreneurship among its students. The Faculty ensures its graduates are well-equipped to become the leaders and entrepreneurs of tomorrow, able to take innovative ideas to market in a successful and timely manner in both established and start-up organizations. The Faculty supports entrepreneurship initiatives that involve student projects, such as conferences, competitions…and more.

NEW
Admission scholarships now available for students demonstrating great potential in entrepreneurship

L´atelier The Workshop

Le centre de mentorat en génie et en informatique
The engineering and computer science mentoring centre

SUCCEED AND TAKE ADVANTAGE OF OUR MENTORING CENTRE:
THE WORKSHOP!

The Workshop is an engineering and computer science mentoring centre, a free resource that supports students in their studies and in their transition to university life. The mentors are third- and fourth-year students from the Faculty who offer the following services to help students fulfill their potential:

- Study guides
- Discussion forums
- Study groups
- One-on-one mentoring: for tips and tricks on time management, exam prep, stress management, memorization and more

We want to see you succeed!
engineering.uOttawa.ca/about/life-on-campus

JOIN THE NEW WOMEN'S START-UP NETWORK

You can take part in this new program to help you reach your full potential as an entrepreneur, create your own company, take part in compelling projects or build a network of women involved in engineering and computer science. Our team of mentors, made up of female senior-level students, is here to help you develop your entrepreneurial skills and make the most of your time at uOttawa.

BRITTANY CLARKE
Fourth year, Civil Engineering

As a competitive cheerleader for the uOttawa Gee-Gees and professional cheerleader for the Ottawa Redblacks, dedicating the time to excel as both an athlete and student has always been of the utmost importance to me.

One great benefit of being a student athlete is being able to focus on myself and my team during practices. In addition, I spend weekends travelling to competitions, which can definitely create additional stress, but it forces me to be organized and focused.

There are not only physical and mental benefits to joining a team but also social benefits. Being part of a school team is a great way to expand your social network by meeting students from other faculties and years. As a member of the Gee-Gee's cheerleading team, I got to connect with fellow students that were also balancing their love for the sport with full-time studies.

Being a part of the school team led me to try out, alongside many of my Gee-Gee teammates, for the Redblacks cheerleading team, where I had opportunity to really connect with the Ottawa community. I think as a student it's very important to get involved with things beyond campus. I will forever cherish all the rewarding experiences I've had on the team.

MENTORING

WHY STUDY ENGINEERING OR COMPUTER SCIENCE?

GO FAR WITH YOUR EDUCATION

BE A DIFFERENCE MAKER

Engineers and computer scientists use creativity and imagination to turn ideas into reality, solve problems and shape the world around us…yesterday, today and tomorrow. These professionals are essential to the safety, health, happiness and comfort of our friends, family and neighbours near and far.

Engineers and computer scientists make a world of difference!

Source: National Academy of Engineering's Changing the conversations campaign

BENEFIT FROM A HIGH EMPLOYMENT RATE

91% of uOttawa engineering alumni find jobs in their field within six months of graduating.*

"There is a large and growing need for employers to replace retiring engineers …. This is particularly true for civil, mechanical, electrical and electronic engineers as well as computer engineers….Replacement demand for engineers is an important theme that will be relevant for the next decade as the baby boom generation retires."**

* Source: MTCU Key Performance Indicators 2014
**Source: Engineering Labour Market in Canada: Projections to 2025, Final Report 2015

GET A GOOD RETURN ON INVESTMENT

A recent study calculated the return on investment of postsecondary degrees by first looking at the wage disparity between degree holders and high school grads over the past four decades.

While holders of bachelor's degrees see a 15% average return on their education investment, engineering degrees come in well ahead of the pack, with a return on investment of 21%.

Source: sourceable.net/engineering-degrees-provide-biggest-returns
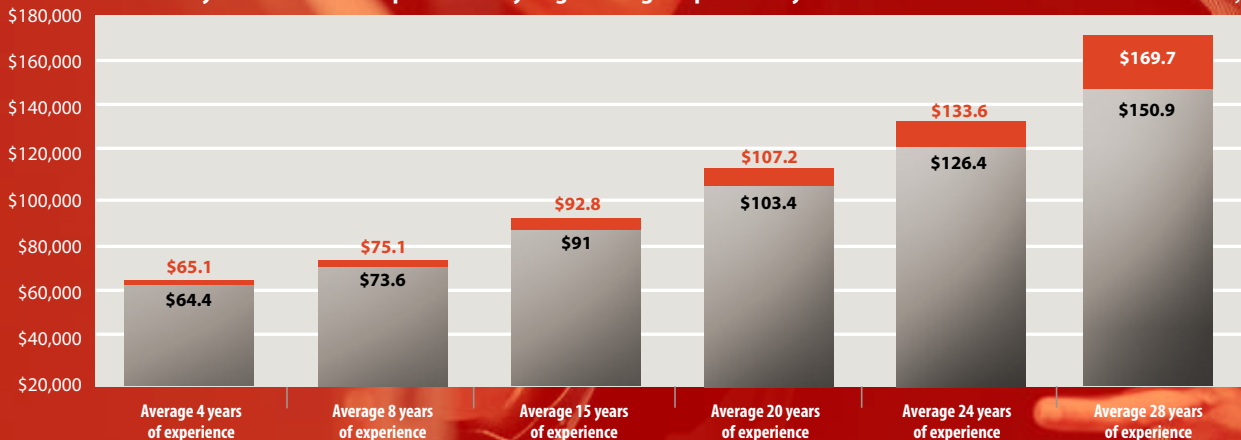
EARN A COMPETITIVE SALARY

Your hard work and dedication will pay off when you graduate with a degree in engineering or computer science. Many recent studies in Canada and in North America have shown that engineering and computer science graduates systematically place at the top of the starting salary scale among all university undergraduate programs of study.

Over the years, engineers can expect their salaries to continuously increase. Here are the average salaries of an engineer working in Ontario according to the level of responsibility and years of experience.

Source: Ontario Society of Professional Engineers Employer Compensation Survey Member Market Survey, 2013 Report

Base Salary & Total Cash Compensation by Engineering Responsibility Level ■ Total Cash ■ Base Salary

Level	Total Cash	Base Salary
Average 4 years of experience	$65.1	$64.4
Average 8 years of experience	$75.1	$73.6
Average 15 years of experience	$92.8	$91
Average 20 years of experience	$107.2	$103.4
Average 24 years of experience	$133.6	$126.4
Average 28 years of experience	$169.7	$150.9

SCHOLARSHIPS

SCHOLARSHIPS TO SUPPORT YOUR STUDIES IN ENGINEERING

At the **FACULTY OF ENGINEERING**, effort and excellence are recognized values.

The Faculty offers a wide range of admission scholarships to encourage student academic success.

DEAN'S MERIT SCHOLARSHIP

Number: 35

Value: Depends on admission average; $5,000 awarded for 95–100% and $4,000 for 90–94.9%

To be eligible, you must:

- Be registered for the first time in an undergraduate program at the Faculty
- Maintain full time registration for the Fall 2016 and Winter 2017 sessions
- Have a minimum admission average of 90% (the admission average includes Faculty of Engineering prerequisites)

Note: This scholarship is open to all students admitted to the Faculty of Engineering, including international students. No application is required for this scholarship; all eligible applicants will be considered.

NEW - ENTRANCE SCHOLARSHIPS FOR ENTREPRENEURIALLY-MINDED STUDENTS

Number: 2

Value: $5,000

To be eligible, you must:

- Personify the spirit, passion, and drive that characterize successful entrepreneurs
- Be registering for the first time in one of the Faculty's undergraduate programs
- Maintain full time registration for the Fall 2016 and Winter 2017 sessions
- Submit a one-page document that describes the entrepreneurial activities that you have led or been actively involved with. You must clearly articulate why you are the ideal candidate for this scholarship.

FACULTY OF ENGINEERING MEMORIAL SCHOLARSHIP

Number: 7 (one scholarship for each engineering program)

Value: $2,000

To be eligible, you must:

- Be a female student registered for the first time in an undergraduate program at the Faculty
- Have a minimum admission average of 80%
- Submit a 250-word text on why you are applying for an Engineering program
- Submit an up-to-date résumé highlighting your latest academic and extracurricular achievements
- Maintain full time registration for the Fall 2016 and Winter 2017 sessions

DROSTE-KENNEDY ADMISSION SCHOLARSHIP IN CIVIL ENGINEERING

Number: Variable

Value: $500 (minimum)

To be eligible, you must:

- Be registered full time in the first year of the Civil Engineering program (regular or CO-OP)
- Be an Ontario resident
- Have a minimum admission average of 80%
- Demonstrate financial need

NORTEL FOUNDING SCHOLARSHIP FOR THE SCHOOL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE (EECS)

Number: 2

Value: $2,500 (minimum)

To be eligible, you must:

- Be registered full time in first year in a program of studies of the School of Electrical Engineering and Computer Science (EECS)—Computer Engineering, Electrical Engineering, Software Engineering or Computer Science
- Be an Ontario resident
- Have a minimum admission average of 80%
- Be a well-rounded individual and possess computer skills
- Demonstrate financial need
- Submit a letter from a teacher outlining your leadership, communication and computer skills
- Submit a letter stating your intention to enter a CO-OP program at the School of EECS
- Submit an official transcript, including your most recent year of completed studies

ONTARIO PROFESSIONAL ENGINEERS FOUNDATION FOR EDUCATION SCHOLARSHIP

Number: One for a male student and one for a female student

Value: $1,000

To be eligible, you must:

- Be registered full time in the first year of an undergraduate program at the Faculty
- Have a high academic standing in the final year of high school
- Be a well-rounded student who exhibits leadership
- Hold an Ontario Secondary School Diploma (OSSD)
- Submit a résumé
- Submit an official transcript, including your most recent year of completed studies.

APPLICATION DEADLINE

March 31, 2016

Application form: Online Scholarships and Bursaries (via uOZone) uOttawa.ca

ENTREPRENEURIAL
ALUMNI

Many **FACULTY OF ENGINEERING** alumni start their own companies and become successful entrepreneurs. Read a few success stories.

DHAN BALACHAND

BASc in Electrical Engineering
Founder and CEO of Sulon Technologies

SULON

Dhan Balachand is the Founder and CEO of Sulon Technologies, a Canadian technology start-up redefining the world of augmented and virtual reality. Since founding the company in 2012, Dhan has been recognized as one of the world's leading authorities on augmented and virtual reality, regularly speaking around the world about creating next-generation immersive experiences. Dhan's passion for innovation and interactive spatial experiences are reflected throughout Sulon, including the company's flagship device the Cortex, an augmented virtual reality headset launching in 2016.

"As engineers, we were trained to be analytical problem solvers. However the greatest skill I learned through the Engineering program wasn't engineering itself. Rather it was an appreciation for Art, Creativity, and "thinking outside of the box." Without both my engineering background and these appreciations, I would be unable to not only solve the traditional problems engineers face, but also the new and complex real-world problems that need completely fresh thinking beyond the realm of engineering.

Being creative is the ability to connect the dots that aren't in-front of you, to find patterns and occurrences in the randomness of space that will help you comprehend the world outside of what is considered normal or practical. It is my belief that we as humans evolve through how we overcome adversity and times of great crisis. We evolve; and to evolve is to know that nothing is truly defined, and that every solution we've created is not the final solution. It is merely a stepping stone to be leveraged by future generations. That is why we must build smartly, creatively, and passionately. The future needs us to provide the foundations to evolve humanity."

CHARLES BLOUIN

BASc Mechanical Engineering, MASc Mechanical Engineering (Candidate)
Co-founder of RCbenchmark.com

RCbenchmark.com

"Entrepreneurship gave me a real understanding of a product's life cycle, from the initial concept stemming from user feedback to production, sales and marketing and finally, product support."

Charles began his bachelor's degree in mechanical engineering at the University of Ottawa by working with the ARISE robotics group. He then went on to work with Green Engineers, where he conducted wind tunnel testing and designed test equipment. Near the end of his time as an undergraduate, he spent a summer working at Saarland University in Germany, thanks to a DAAD grant.

As a master's student, Charles has worked in robotics, specializing in optimal control. He took part in several conferences and when he became interested in entrepreneurship, he took an introductory course in the subject. He went on to win $5000 in the Entrepreneurship Concept- Prize in Entrepreneurship and Innovation (EC-PEI) student competition sponsored by the Faculty of Engineering. This allowed him to test his idea, and win the second phase of the competition, the Launching Entrepreneurs-PEI. Charles and his team reoriented their project, which was then selected for uOttawa's accelerator program, Start-up Garage, where Charles is now working on finalizing and marketing a test bench for robot and drone engines.

Read a few more success stories at:
engineering.uOttawa.ca/entrepreneurship.

Daniel Lutz, Eric Vierich, Francis Lefebvre, Shawn Bashir, Mitchell Geis, Cedric Eveleigh

DEVELOP YOUR ENTREPRENEURIAL
SPIRIT!

VALEO INNOVATION CHALLENGE

Our team of 2 fourth-year electrical engineering students and 4 third-year mechanical engineering students came together to produce a system that can change the way we look at electric vehicles. We've developed a hybrid energy storage system that can increase the range of an electric vehicle by up to 46%!

Our system was entered in an international competition hosted by Valeo, called the Valeo Innovation Challenge, and came in second out of almost 1,000 teams from around the globe. The competition required teams of students to redesign a vehicle part to fit into the car of the future, such as an innovative lighting system, a safety or comfort innovation or, in the case of the uOttawa team, a system to maximize power efficiency and energy management.

Our success was largely due to the support we received from the University of Ottawa, engineering professor Riadh Habash and industrial partners from ZEC Wind Power and Kylowave Inc., both local businesses. The project showcased technical abilities that can only be learned by receiving a world-class education and the support and facilities available at the University of Ottawa. We've gained technical knowledge that cannot be taught in the classroom alone, and entrepreneurial skills that will allow us to excel in a world that is increasingly driven by technology.

Both the University of Ottawa (uOttawa Entrepreneurship Hub) and the Faculty of Engineering (Entrepreneurship and Innovation Endowment Fund and NSERC Chair in Entrepreneurial Engineering Design) actively support and promote student entrepreneurship on and off campus. We aim to raise awareness about entrepreneurship and innovation, develop students' entrepreneurial knowledge and skills, and connect students to the larger Ottawa-Gatineau entrepreneurial ecosystem.

The Faculty of Engineering offers a curriculum that supports various initiatives which prepare students to become the leaders and innovators of tomorrow, and equips them to quickly and successfully take innovative ideas to market in both traditional and entrepreneurial organizations.

INNOVATE WITH YOUR CAPSTONE PROJECT

Most of our programs involve a fourth year capstone project where students have the opportunity to apply the knowledge that they acquired over the course of their studies. This project work provides them with an exceptional opportunity to develop their autonomy, communication, teamwork and design skills, from idea generation, development, implementation and up to the experimental validation of a prototype product or service. Students are strongly encouraged to develop their project with innovation in mind. They also receive guidance and support to readily transform their ideas and work into a commercial offering, and to consider entrepreneurship right upon graduation from the program.

CURRICULUM FOCUSED ON ENTREPRENEURSHIP

Students can explore entrepreneurship thanks to the Engineering Management and Entrepreneurship Option in all undergraduate programs, as well as the Master of Engineering Management degree, a program that prepares engineering professionals for leadership roles and entrepreneurial responsibilities.

APPLY YOUR NEW KNOWLEDGE IN COMPETITION

To build their entrepreneurial spirit and apply their new knowledge, students can tap into plenty of opportunities on campus, such as the Faculty's annual Prizes in Entrepreneurship and Innovation student competitions, with $60,000 in prize money up for grabs. Not only can students win monetary prizes, they can also benefit from valuable advice from industry professionals who get involved as mentors or judges.

BRUNSFIELD GROUP STUDENT ENGINEERING PROJECT AND ENTREPRENEURSHIP CENTRE

This dedicated facility provides engineering students who wish to compete in pre-professional engineering competitions with the space, tools and equipment to design, build and test complex prototypes.

Some of these prototypes have included different types of vehicles, high-performance hybrid motor systems, highly fuel efficient and off-road vehicles, and various other projects such as 3D prototyping printing, concrete toboggans, electrical energy storage and control systems.

Discover the Brunsfield Centre at **engineering.uOttawa.ca/entrepreneurship/brunsfield-centre.**

MAKERSPACE

Invent, play, design and build in the new uOttawa Makerspace. This facility fosters a collaborative environment where students, staff and members of the community can use tools and equipment, share ideas and pursue their creative passions. The Makerspace is equipped with 3D printers, Arduinos, CNC mills, Handibots, laser cutters and much more. Don't know how to use this equipment? Don't worry—Makerspace staff conducts introductory workshops on these tools for students.

This is a student-run space for everyone to collaborate and build dream projects for free!

Discover the Makerspace at **engineering.uOttawa.ca/makerspace.**

FACILITIES
JUST FOR YOU!

Learn more about entrepreneurship and innovation opportunities at engineering.uOttawa.ca/entrepreneurship.

PROFESSIONALS

Through the Entrepreneurship Bridges Lecture Series, offered by the Faculty of Engineering in partnership with the Telfer School of Management, students receive insightful advice from successful technological entrepreneurs. In addition, students can take part in a variety of events, such as panels, lunch-and-learns and elevator pitch competitions, offered by the Entrepreneurship Hub during uOttawa Entrepreneurship Week.

EXPERIENCE YOUR FUTURE CAREER AND HELP FUND YOUR STUDIES THROUGH
THE CO-OP PROGRAM

COMBINE STUDY AND WORK EXPERIENCE

With the Co-operative Education (CO-OP) Program, you can gain hands-on experience in your field of study while you complete your degree. CO-OP can be added to any of the eight undergraduate programs offered by the Faculty.

The University of Ottawa CO-OP program has been running for over 30 years. Now the second largest university program in Ontario, and the fifth-largest in Canada, uOttawa CO-OP boasts a very high placement rate.

As a Faculty of Engineering student, you can benefit significantly from the CO-OP program:

- Find work (97.3% faculty placement rate for winter 2015*)
- Find a public or private sector employer in Canada or even abroad
- Build your professional skills and increase your knowledge
- Network with valuable contacts who can help you kick-start your career
- Benefit from a quality program that meets national criteria and standards and is approved by the Canadian Association for Co-operative Education
- Alternate between work and study terms. Start working in the summer of your second year and then alternate between four-month work and study terms. Eight- and twelve-month work terms are now also available.

* Based on winter 2015 CO-OP data

NEW

ENTREPRENEURIAL CO-OP AND INTERNSHIPS

As a CO-OP student at our Faculty, you can work on your entrepreneurial idea during a CO-OP work term. Imagine getting financial support to work on your own business plan! Or if you prefer, you can try working in a start-up company by doing an entrepreneurial internship!

MANDATORY CO-OP FOR SOFTWARE ENGINEERING

Participation in the CO-OP program is now mandatory for Software Engineering program students to help them develop practical and solution-driven thinking!

STUDENTS AT WORK

STÉPHANIE ZEIDAN
Electrical Engineering,

RCMP in Ottawa

KRISTOPHER TREMBLAY PICARD
Civil Engineering,

PCL in Ottawa and Vancouver

NEMANJA BABIC
Biomedical Mechanical Engineering

Technische Universität Darmstadt, Germany

KATELYN GENOUD
Fourth year, Biomedical Mechanical Engineering, CO-OP

I chose the CO-OP option because I wanted to really know if engineering was right for me. Getting the chance to work in four vastly different industries while doing my degree has allowed me to explore the opportunities engineering provides.

For my third work term, I found a placement in Switzerland with the help of an international program, International Association for the Exchange of Students for Technical Experience (IAESTE). I spent four months living in a small French-speaking town in the eastern part of the country. I worked for Medos Codman (a Johnson & Johnson company) in their production group for the Hakim programmable brain valve. My weekends were spent travelling around Switzerland exploring the different regions, eating amazing food and meeting new people. The biggest thing I learned abroad was about the diversity of workplace cultures and how to deal with the steep learning curve of a new job.

Through experience, CO-OP teaches you how to act in a workplace, how every workplace environment and culture can be different, and how to adapt quickly. I don't think my experience at uOttawa would have been as influential without the CO-OP program, and I strongly suggest that future students apply.

WORK/STUDY SEQUENCES

The majority of students follow this sequence, although it can be adapted to suit your circumstances.

YEAR OF STUDY	FALL	WINTER	SUMMER
1	Study	Study	—
2	Study	Study	Work 1
3	Study	Work 2	Study
4	Work 3	Study	Work 4
5	Study	—	—

LAURA WISMER
Chemical Engineering

Syncrude in Alberta

GET INVOLVED AND ENRICH YOUR
STUDENT EXPERIENCE!

Would you enjoy being part of a team building a highly fuel-efficient or off-road vehicle? Or would you like to design a human hamster wheel for a museum display that teaches people about energy consumption? Then join an engineering club to work on these kinds of exciting projects!

You could also participate in the Great Northern Concrete Toboggan Race or showcase your design talents at the Ontario Engineering Competition. Why not take on the challenge of testing your technical skills against students from other Canadian universities at the annual Computer Science Games? Or the challenge of commercializing your end-of-studies capstone design project in the annual Prizes in Entrepreneurship and Innovation student competition? Join an association or a club and make the most of your university experience.

The life of a student at the Faculty of Engineering is anything but dull!

MAKE YOUR PROJECTS AND ACTIVITIES A REALITY THROUGH A VARIETY OF AVAILABLE FUNDING!

Funds to support your student projects and activities are now more available than ever thanks to the support of the Faculty and various funds: Engineering Endowment Fund, Centre for Entrepreneurial Engineering Design, Brunsfield Group Centre, etc....

The common objective of these funds is to enhance the quality of engineering students' education and university experience. We encouraged all engineering students to submit a Fund application to finance a project or activity that would benefit the engineering student body.

OTHER

OTHER SUB-ASSOCIATIONS AND CLUBS INCLUDE:

- Mechanical Engineering Students Society (MESS), mess.essaeg.ca
- Canadian Society for Civil Engineering (CSCE) csce.essaeg.ca
- Chemical Engineering Student Society (ChESS)
- uOttawa Supermileage
- uOttawa Baja SAE
- uOttawa Formula SAE

Check out the Life on Campus section of our website for more details on associations and clubs: **engineering.uOttawa.ca/en/ associations_clubs.**

HERE ARE JUST A FEW OF THE STUDENT ASSOCIATIONS AND CLUBS
YOU COULD JOIN

ENGINEERING STUDENT SOCIETY (ESS) AND COMPUTER SCIENCE STUDENT ASSOCIATION (CSSA)

The ESS and CSSA represent uOttawa Faculty of Engineering students; these are your associations. Get involved in your student community. You'll come to know your colleagues better by participating in the various activities and events put on by and for students.

Find out more about the ESS at **essaeg.ca** and the CSSA at **cssa-aei.ca**.

GREEN ENGINEERS

Work with industry partners and apply your knowledge to design, build and operate specific projects, such as a dual wind turbine, a human hamster wheel, a wind tunnel and much more.

Find out about current projects at **GreenEngineers.ca.**

EMILY PROCHER
Fourth year, Biomedical Mechanical Engineering

The Great Northern Concrete Toboggan Race, or GNCTR, is Canada's oldest and largest undergraduate engineering competition. Students from schools coast to coast build toboggans with skis, or other running surfaces, made entirely of concrete and compete in a race down a ski hill. There are five main rules when building the toboggans. They must hold five people, have working steering and brakes, have a safety roll cage, weigh less than 300 pounds and have a running surface made entirely of concrete.

Students on the University of Ottawa team learn countless skills that are hard to learn sitting in a classroom. From the drawing board to race day, the toboggans are the work of the students alone. We cut our own metal, pour our own concrete and even try our hand at welding! We also learn valuable soft skills when contacting local and national companies to fund our endeavours. This year, we were strong contenders, winning Best Steering Performance overall and coming third for fastest speed.

UOTTAWA IEEE WOMEN IN ENGINEERING

The mission of uOttawa IEEE Women In Engineering (WIE) is to inspire, engage, encourage and empower women to pursue their academic interests leading to a career in engineering. The WIE team works hard to organize receptions and networking events every year to recognize women in engineering.

Find out more at **celebratewie.ca.**

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

Are you a technology enthusiast? The University of Ottawa student branch of IEEE connects students studying in technology-related fields with industry professionals. The IEEE also puts on events at the University, promoting a fun and stimulating environment for students.

To keep up with branch events, visit **ieeeuottawa.ca**.

ENGINEERS WITHOUT BORDERS

Put your engineering talents to good use! Engineers Without Borders works to support developing communities around the world by helping them gain access to technologies that could improve their lifestyle.

Find out more about EWB at: **uOttawa.ewb.ca**.

SCHOOL OF EECS

The School of Electrical Engineering and Computer Science (EECS) is part of the Faculty of Engineering. This interdisciplinary school combines four cutting-edge programs. Having these closely-related programs together in one academic unit means that you benefit from professors with interdisciplinary knowledge gained from teaching in one or more of the four programs offered by the school.

	ELECTRICAL ENGINEERING	SOFTWARE ENGINEERING	COMPUTER SCIENCE	COMPUTER ENGINEERING
Program description	Offers a solid foundation in mathematics and physics. The study of electricity, circuit theory and electronics to design communication devices, power generators, solid-state circuits, microelectronic devices and computing devices.	Studies the systematic design and development of large-scale software within time and cost constraints. Students learn how to apply engineering principles through various stages: requirements analysis, measurement, modelling, validation, design, construction, testing, documentation, and management.	Combines the fundamental study of computation and information processing with its application to the world around us. Computer scientists build fast, reliable and secure software systems to organize, store and analyse information.	Combines fundamental principles from both electrical engineering and computer science, leading to more specialized studies in microprocessor-based systems, computer architecture, programming concepts, real-time systems and computer control in robotics.
Available options	Engineering Management and Entrepreneurship	Engineering Management and Entrepreneurship	Engineering Management and Entrepreneurship

Mathematics

Majors and minors in several different disciplines | Engineering Management and Entrepreneurship |
| Examples of subject matter | Circuit theory, electronics, telecommunications, networks, photonics, power generation, microwaves | Software construction, requirements engineering, software design and architecture, analysis and design of user interfaces | Data structures and algorithms, design and analysis of algorithms, artificial intelligence, WWW structures, techniques and standards, databases | Electronics and circuit theory, software construction, computer architecture, real-time systems design, computer network design |

GRADUATES FROM EECS HAVE EXCITING, HIGH-QUALITY AND WELL-PAID JOBS

In recent surveys, alumni have indicated their satisfaction with the quality of education they received at the School of EECS. They recognize how much the program contributed toward strengthening their analytic abilities, and they found positions in their fields soon after graduating. These results are not surprising given the quality of jobs available in this area across North America.

According to a CareerCast study, software engineer and computer systems analyst are ranked among the top 10 best jobs of 2014.

Source: 2014 Jobs Rated report, www.CareerCast.com

ELG
ELECTRICAL ENGINEERING

Electrical engineering is at the heart of today's exciting advances in technology. With five technical specializations—communications, systems, electronics, microwave and photonic, and power and sustainable energy, our curriculum will enable you to influence how the world's communities communicate, generate sustainable energy and heal disease. As an electrical engineer, you'll work with other engineers or scientists on emerging technologies.

The Engineering Management option will provide you with the necessary skills to pursue entrepreneurial activities and start your own technology-related business. The double degree program—BASc in Electrical Engineering and BSc in Computing Technology—will put you at the intersection of two areas that propel technological development.

CAREER OPPORTUNITIES

- Electronics and chip designer
- Electromagnetics engineer
- Communications engineer
- Signal-processing engineer
- Product engineer
- Automation engineer
- Avionics engineer
- Biomedical engineer
- Power systems and renewable energy engineer

WHERE DO OUR ELECTRICAL ENGINEERING GRADUATES WORK?

- Rami Abielmona (MASc 2002, PhD 2007), VP Research & Engineering at Larus Technologies in Ottawa
- Frank Bouchard (BASc '11, MEng '13), Inventor and co-founder of Wipebook, Ottawa
- Asif Hameed (BASc '05), Senior Sales Engineer, Unity Connected Solutions in Toronto
- Raihan Khondker (BASc '08), Senior Electrical Systems Engineer at STP Nuclear Operating Company, Houston, Texas

EXAMPLES OF COURSES IN ELECTRICAL ENGINEERING

ELG4115	Microwave Circuits
ELG4117	Optoelectronics and Optical Components
ELG4118	Wave Propagation and Antennas
ELG 4125	Electric Power Transmission, Distribution and Utilization
ELG4126	Sustainable Electrical Power Systems
ELG4137	Principles and Applications of VLSI Design
ELG4139	Electronics III
ELG4159	Integrated Control Systems
ELG4176	Communication Systems
ELG4179	Wireless Communication Fundamentals
ELG4177	Digital Signal Processing
ELG4178	Optical Communications and Networking

Consult the full course sequence at engineering.uOttawa.ca.
All courses are offered in English and most courses are available in French.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

BASc in Electrical Engineering
BASc in Electrical Engineering, Engineering Management and Entrepreneurship Option
BASc in Electrical Engineering and BSc in Computing Technology

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Engineering (MASc) in Electrica and Computer Engineering
Master of Applied Science (MASc) in Electrical and Computer Engineering
Master of Applied Science (MASc) Electrical and Computer Engineering Specialization in Science, Society and Policy
Doctorate (PhD) in Electrical and Computer Engineering

PEG

PHYSICS AND ELECTRICAL ENGINEERING

NEW INTEGRATED PROGRAM

Discover the fundamental laws of nature and then apply this knowledge to design breakthrough technologies that will transform our society. While physics probes big questions ranging from the origin of the universe to the workings of the quantum world, electrical engineering underlies the technologies that are ubiquitous to our modern world, from power generation to the computer chip. By teaching you the foundations of how nature works, and then how to innovate with this knowledge, this integrated program will uniquely equip you to tackle societal and technological problems facing us and future generations. In five years, you will earn two degrees, one in physics and one in electrical engineering, and will be truly challenged to defy the conventional.

CAREER OPPORTUNITIES

- Physicist
- Electrical engineer
- Industrial research and development scientist or engineer
- Materials scientist
- Avionics engineer
- Power systems and renewable energy engineer
- Biomedical researcher or engineer

EXAMPLES OF COURSES IN PHYSICS AND ELECTRICAL ENGINEERING:

PHY2311	Waves and Optics
PHY3355	Statistical Thermodynamics
PHY4370	Quantum Mechanics
PHY4382	Introduction to Solid State Physics
ELG2138	Circuit Theory I
ELG3126	Random Signals and Systems
ELG4115	Microwave Circuits
ELG4126	Sustainable Electrical Power Systems

Consult the full course sequence at engineering.uOttawa.ca.
All compulsory courses are offered in English and in French.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

Honours BSc with Specialization in Physics/BASc in Electrical Engineering

To be admitted to this program, applicants must submit their application to the Faculty of Science.

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Applied Science (MASc) in Electrical and Computer Engineering

Master of Applied Science (MASc) in Electrical and Computer Engineering with Specialization in Science, Society and Policy

Master of Engineering (MEng) in Electrical and Computer Engineering

Doctorate (PhD) in Electrical and Computer Engineering

Master of Science (MSc) in Physics

Master of Science (MSc) in Physics with Specialization in Science, Society and Policy

Doctorate (PhD) in Physics

SEG

SOFTWARE ENGINEERING

Software engineering is a CO-OP only program that emphasizes innovation and teamwork to develop practical, solution-driven thinking. During their fourth-year project, students in this program can form teams and leverage their work experience to create real applications; some students even start their own companies. They learn how to apply engineering principles—including rapid prototyping, requirements analysis, system modelling, design, implementation, testing and project management—to develop software. Software engineers are key professionals in fields such as high tech, finance, telecommunications, government, health care, transportation and entertainment. The Extended French Stream (EFS) is newly available to students who want to continue their French immersion studies during their university career.

CAREER OPPORTUNITIES

- Software engineer
- Systems architect
- Computer security analyst
- Quality assurance engineer
- Video game designer
- Mobile application developer
- Systems analyst
- User interface designer
- Telecommunications engineer

WHERE DO OUR SOFTWARE ENGINEERING GRADUATES WORK?

- Jeffrey Arcand (BASc '13), Software Engineer at Cisco, Ottawa
- Daniel Godfrey (BASc '12), Software Engineer at Amazon in Seattle, Washington
- Marc Stogaitis (BASc '08), Software Engineer at Google in San Francisco, California

EXAMPLES OF COURSES IN SOFTWARE ENGINEERING

SEG2105	Introduction to Software Engineering
SEG2106	Software Construction
SEG3101	Software Requirements Analysis
SEG3102	Software Design and Architecture
SEG3103	Software Quality Assurance
SEG3125	Analysis and Design of User Interfaces
SEG4105	Software Project Management
SEG4145	Real Time and Embedded Software Design
SEG4910	Software Engineering Capstone Project

Consult the full course sequence at engineering.uOttawa.ca.
Courses are offered in English and in French. Some advanced courses are offered in English only.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

EXCLUSIVELY COOP

BASc in Software Engineering (CO-OP)
BASc in Software Engineering (CO-OP), Engineering Management and Entrepreneurship Option
The Extended French Stream (EFS) is available.

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Computer Science (MCS)

Master of Computer Science (MCS) with Specialization in Bioinformatics

Master of Computer Science (MCS) with CO-OP option

Master of Engineering (MEng) in Engineering Management

Doctorate in Computer Science (PhD)

CSI

COMPUTER SCIENCE

Computer science at the School of Electrical Engineering and Computer Science combines the study of computation and information processing fundamentals with their application in the world around us. Computer scientists build fast, reliable, scalable and secure software systems to organize and analyze information. The honours curriculum comprises advanced topics in databases, artificial intelligence, computer graphics, security, distributed computing and algorithm design, culminating in an honours project. This program teaches graduates how to use their creative and innovative talents to conceive, design and implement software systems. The Extended French Stream (EFS) is now available to all students in the Computer Science program. Our degrees are very flexible and include options, minors and a major, which can be used to explore connections between computer science and many other fields of study.

CAREER OPPORTUNITIES

Software technologies and systems developer in many diverse fields, including entertainment, government and business.

WHERE DO OUR COMPUTER SCIENCE GRADUATES WORK?

- Christopher Saunders (BSc '10), Software Developer, Shopify in Ottawa
- Julie Kathryn Luckham (BSc '08), Software Engineer, Wayfair in Boston, Massachusetts
- Naim El-Far (PhD 2008), Trade Execution Developer at Bridgewater Associates, Greater New York City Area
- Pengcheng Xi (MCS '07), Research Officer, National Research Council Canada in Ottawa

EXAMPLES OF COURSES IN COMPUTER SCIENCE

CSI3104	Introduction to Formal Languages
CSI3105	Design and Analysis of Algorithms I
CSI3120	Programming Language Concepts
CSI3130	Databases II
CSI3131	Operating Systems
CSI3140	WWW Structures, Techniques and Standards
CSI4900	Honours Project
CSI4139	Design of Secure Computer Systems
CSI4106	Introduction to Artificial Intelligence
CSI4130	Computer Graphics

Consult the full course sequence at engineering.uOttawa.ca.
All compulsory courses are offered in English and in French.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

Honours BSc with Specialization in Computer Science
Honours BSc with Specialization in Computer Science, Management and Entrepreneurship Option
Joint Honours BSc in Computer Science and Mathematics
Major in Computer Science
Minor in Computer Science*
Minor in Computer Science for Scientists*

The Extended French Stream (EFS) is available.

*Complementary program offered only as a second discipline. Registration starts in second year.

ACCELERATED STREAM

You can complete your Honours BSc with Specialization in Computer Science and your Master of Computer Science within five years with the newly introduced Accelerated Stream.

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Computer Science (MCS)
Master of Computer Science (MCS) with Specialization in Bioinformatics
Master of Computer Science (MCS) with CO-OP option
Doctorate in Computer Science (PhD)

COMPUTER ENGINEERING

Building on a solid foundation of traditional engineering skills, this program covers many different aspects of computer software and hardware, and allows for more specialized studies in microprocessor-based systems, computer architecture, programming concepts, real-time operating systems, software engineering and robotics. This program provides multiple paths to diverse careers.

CAREER OPPORTUNITIES

- Hardware designer
- Computer applications engineer
- Embedded microsystems engineer
- Wireless and network systems technical manager
- Software developer
- Systems engineer

WHERE DO OUR COMPUTER ENGINEERING GRADUATES WORK?

- Letlhogonolo Letto Moshabi (BASc '08), Systems Analyst at Mascom Wireless in Gaborone, Botswana
- Carla Dinardo (BASc '03), Section Head at Canadian Intellectual Property Office, Ottawa

EXAMPLES OF COURSES IN COMPUTER ENGINEERING

CEG3136	Computer Architecture II
CEG3155	Digital Systems II
CEG3156	Computer Systems Design
CEG4158	Computer Control in Robotics
CEG4166	Real-Time Systems Design
CEG4190	Computer Network Design
CEG4316	Digital Image Processing
CEG4399	Design of Secure Computer Systems

Consult the full course sequence at engineering.uOttawa.ca.
All courses are offered in English and most courses are available in French.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

BASc in Computer Engineering
BASc in Computer Engineering, Engineering Management and Entrepreneurship Option

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Engineering (MEng) in Electrical and Computer Engineering
Master of Applied Science (MASc) in Electrical and Computer Engineering
Master of Applied Science (MASc) in Electrical and Computer Engineering with Specialization in Science, Society and Policy
Doctorate (PhD) in Electrical and Computer Engineering

CHG

CHEMICAL ENGINEERING

Chemical engineering is at the intersection of many disciplines, linking knowledge of basic and applied sciences, economics, and health and safety. Chemical engineering graduates use a series of operations to sustainably process raw natural materials into finished products. They work in any number of industries and during their careers, they may face a variety of challenges, such as optimizing processes and monitoring pollution, converting waste materials into renewable energy, processing foods and drugs, and manufacturing new materials.

CAREER OPPORTUNITIES

- Chemical engineer
- Process engineer
- Petrochemical engineer
- Biotechnological engineer
- Environmental engineer
- Biomedical engineer

WHERE DO OUR CHEMICAL ENGINEERING GRADUATES WORK?

- Daniel Dicaire (BASc '08, MASc '10), Energy Efficiency and Sustainability Officer, Community Housing Corporation in Ottawa
- Nicholas Chan (BASc '03, MASc '08), Waste Characterization Analyst, Atomic Energy of Canada Limited in Chalk River, Ontario
- Denis Myre (BASc '08, MASc '11), Environment Supervisor at Fortress Cellulose Spécialisée in Thurso, Quebec

EXAMPLES OF COURSES IN CHEMICAL ENGINEERING

CHG3112	Process Synthesis, Design and Economics
CHG3335	Process Control
CHG4305	Advanced Materials in Chemical Engineering
CHG4307	Clean Processes and Sustainable Development
CHG4343	Computer-Aided Design in Chemical Engineering
CHG4244	Plant Design Project

Consult the full course sequence at engineering.uOttawa.ca.
All courses are offered in English. French courses are available in first and second year, and are very limited in third and fourth year.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

BASc in Chemical Engineering
BASc in Chemical Engineering, Engineering Management and Entrepreneurship Option
BASc in Chemical Engineering, Environmental Engineering Option
BASc in Chemical Engineering and BSc in Computing Technology

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Engineering (MEng) in Chemical Engineering
Master of Applied Science (MASc) in Chemical Engineering
Doctorate (PhD) in Chemical Engineering
Master of Engineering (MEng) in Environmental Engineering
Master of Applied Science (MASc) in Environmental Engineering
Master of Applied Science (MASc) in Chemical Engineering with Specialization in Science, Society and Policy
Doctorate (PhD) in Environmental Engineering

BCH

BIOTECHNOLOGY

Learn how living organisms grow and develop, and how we can use this knowledge to create manufacturing processes, chemical products and life-saving drugs. Did you know that proteins, yogurt and biodiesel are all biotechnology products? So are insulin and the chickenpox vaccine, both of which have saved or improved the lives of millions. The Biotechnology program covers the fields of biology, chemistry, mathematics, engineering science and engineering design. Students in this program receive two degrees upon graduation: a BSc in Biochemistry and a BASc in Chemical Engineering.

To be admitted into this program, applicants must submit their application to the Faculty of Science.

CAREER OPPORTUNITIES

- Process engineer
- Biomedical engineer
- Chemical engineer
- Environmental engineer
- Biochemist
- Biotechnology engineer
- Cell biologist
- Patent-law specialist

WHERE DO OUR BIOTECHNOLOGY GRADUATES WORK?

- Marc Duchesne (BASc '08), Postdoctoral Researcher at Natural Resources Canada in Ottawa
- Kamil Mroz (BASc '10) Engineer, Novo Nordisk Engineering (NNE) Pharmaplan in Brussels, Belgium
- Nilesh Patel (MASc '03, PhD '08), Manager Process Improvement at Sanofi Pasteur in Toronto, Ontario

EXAMPLES OF COURSES IN BIOTECHNOLOGY

BCH3170	Molecular Biology
BCH4172	Topics in Biotechnology
CHG3127	Chemical Reaction Engineering
BCH4101	Human Genome Structure and Function
CHG4381	Biochemical Engineering
CHG4244	Plant Design Project

Consult the full course sequence at engineering.uOttawa.ca.
All courses are offered in English. French courses are available in first, second and third year.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

Honours BSc in Biochemistry (biotechnology) and BASc in Chemical Engineering (biotechnology)

To be admitted to this program, applicants must submit their application to the Faculty of Science.

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Engineering (MEng) in Chemical Engineering
Master of Applied Science (MASc) in Chemical Engineering
Master of Applied Science (MASc) in Chemical Engineering with Specialization in Science, Society and Policy
Doctorate (PhD) in Chemical Engineering
Master of Engineering (MEng) in Environmental Engineering
Master of Applied Science (MASc) in Environmental Engineering
Doctorate (PhD) in Environmental Engineering
Master of Science (MSc) in Biochemistry
Master of Science (MSc) in Biochemistry with Specialization in Bioinformatics
Master of Science (MSc) in Biochemistry with Specialization in Human and Molecular Genetics
Master of Science (MSc) in Biochemistry with Specialization in Pathology and Experimental Medicine
Doctorate (PhD) in Biochemistry
Doctorate in Philosophy (PhD) in Biochemistry with Specialization in Human and Molecular Genetics
Doctorate in Philosophy (PhD) in Biochemistry with Specialization in Pathology and Experimental Medicine

CVG

CIVIL ENGINEERING

Civil engineers design the infrastructure on which their communities depend, such as buildings and their foundations, bridges, canals, dams, transportation facilities, municipal sewer and water networks, and wastewater and solid waste treatment systems.

Civil engineering students at the University of Ottawa can take advantage of world class teaching laboratories, multimedia classrooms and outstanding computer facilities. Students develop expertise in computer applications, field and laboratory testing and project management, and they are well-equipped to serve their communities upon graduation.

CAREER OPPORTUNITIES

- Consulting engineer
- Structural or construction engineer
- Geotechnical engineer
- Environmental engineer
- Water-resources engineer
- Municipal engineer
- Research engineer
- Contractor

WHERE DO OUR CIVIL ENGINEERING GRADUATES WORK?

- Marie-Josée Bussières (BASc '08), Construction Project Manager, Pomerleau in Ottawa
- Alexandra Lavictoire (BASc '12, MASc '14), Jr. Water Resources Analyst, Lake of the Woods Control Board, at Water and Climate Services Canada in Ottawa
- Andrew Dowie (BASc '06), Policy and Economic Development Officer, City of Windsor

EXAMPLES OF COURSES IN CIVIL ENGINEERING

CVG2107	Geotechnical Materials and Processes
CVG2116	Introduction to Fluid Mechanics
CVG2132	Fundamentals of Environmental Engineering
CVG3109	Soil Mechanics I
CVG3116	Hydraulics
CVG3132	Physical / Chemical Unit Operations of Water and Wastewater Treatment
CVG3140	Theory of Structures I
CVG3147	Structural Steel Design I
CVG3148	Reinforced Concrete Design
CVG4108	Geotechnical Design I
CVG4150	Highway and Transportation Engineering
CVG4173	Construction Management

Consult the full course sequence at engineering.uOttawa.ca.
All courses are offered in English. French courses are available in first and second year.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

BASc in Civil Engineering
BASc in Civil Engineering, Engineering Management and Entrepreneurship Option
BASc in Civil Engineering, Environmental and Water Resources Option
BASc in Civil Engineering, Structural Geotechnical Option
BASc in Civil Engineering and BSc in Computing Technology

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Engineering (MEng) in Civil Engineering
Master of Applied Science (MASc) in Civil Engineering
Master of Applied Science (MASc) in Civil Engineering with Specialization in Science, Society and Policy
Doctorate (PhD) in Civil Engineering
Master of Engineering (MEng) in Environmental Engineering
Master of Applied Science (MASc) in Environmental Engineering
Doctorate (PhD) in Environmental Engineering

MGB

BIOMEDICAL MECHANICAL ENGINEERING

The purpose of the Biomedical Mechanical Engineering program is to graduate engineers proficient in the areas of biomedical science that relate to mechanical engineering. These engineers specialize in areas that include: the design of medical devices, such as artificial hearts, implants and prostheses; the development and selection of bio-compatible metallic and non-metallic materials for implants and medical equipment; robotics for medical applications; biomechanics and rehabilitation engineering. The program structure parallels that of the regular Mechanical Engineering program but replaces eight courses in the regular program with courses that focus on biomedical systems.

This program's broad scope gives its graduates a wide range of career options, not only in the biomedical field but also in conventional mechanical engineering. Biomedical systems are among the most complex mechanical systems; therefore, a strong and comprehensive education in standard mechanical engineering principles is provided, with emphasis on their application to biomedical systems.

CAREER OPPORTUNITIES

- Rehabilitation engineer
- Biomedical engineer
- Mechanical engineer

WHERE DO OUR BIOMEDICAL MECHANICAL ENGINEERING GRADUATES WORK?

- Thomas Souchen (BASc '10), Medical Student and Research Projects Officer at The Australian e-Health Research Centre in Brisbane, Australia
- Arwen Moore (BASc '11), Director of Biomedical Product Development at Personal Neuro Devices in Ottawa

EXAMPLES OF COURSES IN BIOMEDICAL MECHANICAL ENGINEERING

MCG2131	Thermodynamics II
MCG2142	Biological and Engineering Materials II
MCG3110	Heat Transfer
MCG3131	Machine Design
MCG3141	Biomechanics
MCG3142	Biocontrol Systems
MCG 3143	Bio-fluid Mechanics
MCG4150	Bioinstrumentation
MCG4151	Design of Artificial Joint Prostheses and Implants
MCG4152	Design of Artificial Organs

Consult the full course sequence at engineering.uOttawa.ca.
All courses are offered in English. All first and second year courses, and some third year courses, are also available in French.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

BASc in Biomedical Mechanical Engineering
BASc in Biomedical Mechanical Engineering and BSc in Computing Technology

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Engineering (MEng) in Mechanical Engineering
Master of Applied Science (MASc) in Biomedical Engineering
Doctorate (PhD) in Mechanical Engineering

MCG

MECHANICAL ENGINEERING

Mechanical engineers apply the fundamentals of science and math to create practical, useful solutions for a wide range of mechanical, thermal and biomedical systems and devices, from computer parts to power plants, from manufacturing systems to spacecraft.

This is a broad-based area of engineering, and graduates find work in almost every industrial sector, including high tech, aerospace, manufacturing, automotive, energy, biomedicine and consulting.

CAREER OPPORTUNITIES

- Aeronautical/aerospace engineer
- Automotive engineer
- Manufacturing engineer
- Robotics/automation/controls engineer
- Energy systems engineer
- Biomedical engineer
- Consulting engineer
- Renewable energy engineer

WHERE DO OUR MECHANICAL ENGINEERING GRADUATES WORK?

- Anthony Bagnulo (BASc'10), Senior Test Engineer, Tesla Motors in California
- Miguel Clément (BASc '05), Co-Founder, Inovatech Engineering Corporation of Ottawa

EXAMPLES OF COURSES IN MECHANICAL ENGINEERING

MCG3110	Heat Transfer
MCG3131	Machine Design
MCG3145	Advanced Strength of Materials
MCG3306	Control Systems I
MCG3340	Fluid Mechanics I
MCG4308	Mechanical Vibration Analysis
MCG4322	Computer-Aided Design
MCG4328	Manufacturing
MCG4136	Mechatronics
MCG 4345	Aerodynamics
MCG 4111	Internal Combustion Engines

Consult the full course sequence at engineering.uOttawa.ca.
All courses are offered in English. All first and second year courses, and some third year courses, are also available in French.

UNDERGRADUATE PROGRAMS *(bachelor's degrees)*

BASc in Mechanical Engineering
BASc in Mechanical Engineering, Engineering Management and Entrepreneurship Option
BASc in Mechanical Engineering and BSc in Computing Technology

GRADUATE PROGRAMS *(master's and doctorate degrees)*

Master of Engineering (MEng) in Mechanical Engineering
Master of Applied Science (MASc) in Mechanical Engineering
Doctorate (PhD) in Mechanical Engineering

GET MORE THAN JUST A DEGREE – PERSONALIZE YOUR PROGRAM TO SUIT YOUR INTERESTS! YOU CAN CHOOSE TO ADD ONE OF THESE TWO OPTIONS TO MOST ENGINEERING OR COMPUTER SCIENCE PROGRAMS:

ENGINEERING MANAGEMENT AND ENTREPRENEURSHIP

This option provides students with the opportunity to develop their entrepreneurial spirit and the tools to develop their management skills. Students learn about product development, financing, marketing and building a business plan. You may add this option to your program without adding any extra time to complete your degree.

COMPUTING TECHNOLOGY

In many industries such as automotive, aerospace and construction, the integration of mechanical, electrical and computer engineering is very high. Sensors, controllers and microprocessors are integrated into cars, airplanes, smart houses, and even smart roads; Computing technologies are omnipresent!

In a competitive job market, this option can make your résumé standout from the others. Computing Technology is offered as a second degree and consists of courses that are common to all programs as well as courses that can complement your specific engineering program.

ME

CUSTO MIZE YOUR degree!

OR YOU MAY WANT TO CHOOSE A SPECIFIC OPTION ACCORDING TO YOUR CHOICE OF PROGRAM. HERE ARE SOME EXAMPLES:

ELECTRICAL ENGINEERING PROGRAM

- Power and Sustainability
- Communications
- Systems Engineering
- Electronics
- Microwave and Photonics Engineering

CIVIL ENGINEERING PROGRAM

- Environmental and Water Resources
- Structural and Geotechnical

CHEMICAL ENGINEERING PROGRAM

- Environmental Engineering

COMPUTER SCIENCE PROGRAM

- Mathematics

Select a complementary minor or major from a large array of disciplines.

Consult the full list of options with all the details at **engineering.uOttawa.ca/about/programs.**

SAMIRA EL-RAYYES – IEEE SCHOLARSHIP

Software Engineering graduate, Recipient of the IEEE Canadian Foundation Scholarship

I became involved in the student community during my first week, after I attended the Faculty of Engineering Welcome Day, where I met people from many faculty clubs and associations. When I first met with the executives of the IEEE uOttawa Student Branch, I was drawn to their vision of building professional and social student networks by organizing various events. That year, I ran for my first executive position on the student branch, as vice-chair of the Women in Engineering group. Being elected has changed the course of my university career. In my second year, I was elected promotions liaison officer. In third year, I became the chair of IEEE uOttawa. Professor Shirmohammadi nominated me for this scholarship because of my long-term involvement with IEEE. I am extremely honoured to have received it. Although I originally started volunteering with the IEEE to help other students build their networks, I think I was the one who benefited most from this experience. Working with IEEE has not only provided me with professional connections that have helped me move forward towards my future career, but also surrounded me with incredible individuals who have continually supported me during the past few years.

ONTARIO
ADMISSION REQUIREMENTS

GENERAL REQUIREMENTS

Students must have an Ontario Secondary School Diploma with at least six 4U or 4M courses, including the prerequisites listed below. Your admission average is calculated based on your six best interim or final Grade 12 courses at the 4U or 4M level, including the prerequisites for your program of choice.

These are minimum requirements only. They are subject to change. Admission is not guaranteed.

DISCIPLINE	PREREQUISITES AND ADDITIONAL REQUIREMENTS	ADMISSION AVERAGE
Biomedical Mechanical Engineering	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1]; Biology 4U; Chemistry 4U; Physics 4U **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	85% – 89%
Biotechnology (Biochemistry and Chemical Engineering) *For this program, you need to submit your admission application to the Faculty of Science.*	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1]; <u>two of the following:</u> Biology 4U, Chemistry 4U, Physics 4U, Earth and Space Science 4U **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.** **See www.science.uOttawa.ca for recommended courses.[2]**	84% – 88%
Chemical Engineering Mechanical Engineering	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1]; Chemistry 4U; Physics 4U **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	84% – 88%
Civil Engineering	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1]; Chemistry 4U; Physics 4U **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	82% – 86%
Computer Science	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1] **A combined minimum average of 70% is required for all prerequisite mathematics courses.**	78% – 82%
Computer Science Mathematics	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1] **A combined minimum average of 70% is required for all prerequisite mathematics courses.**	80% – 84%
Computer Engineering Electrical Engineering	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1]; Chemistry 4U; Physics 4U **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	78% – 82%
Physics and Electrical Engineering *For this program, you need to submit your admission application to the Faculty of Science.*	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1]; Chemistry 4U; Physics 4U **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	84% – 88%
Software Engineering (Offered with the CO-OP option only)	English or *Français* 4U; Advanced Functions 4U; Calculus and Vectors 4U[1]; Physics 4U **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	78% – 82%

[1] *Students who have completed Advanced Functions 4U but have not completed Calculus and Vectors 4U can take the replacement course at the University of Ottawa either the summer before or during their first term.*

[2] *Past experience indicates that students with a strong background in biology, chemistry and physics have an increased rate of success.*

SECONDARY V GENERAL REQUIREMENTS

Students must have a Quebec Secondary School Diploma with five Secondary V courses, including program-specific prerequisites. A minimum average of 84% is required but does not guarantee admission. The admission average is calculated based on a student's best Secondary V courses, including the prerequisites for the student's selected program.

CEGEP GENERAL REQUIREMENTS

Students must have a minimum of 12 CEGEP courses, including program-specific prerequisites, but excluding physical education and make-up courses. Your admission average is calculated based on completed courses, excluding physical education and make-up courses. We do not take the "R" rating into consideration. You may receive up to 15 credits of advanced standing. The credits we grant depend on the courses you've completed, the grades you've achieved and the program to which you are admitted.

These are minimum requirements only. They are subject to change. Admission is not guaranteed.

DISCIPLINE	SECONDARY SCHOOL Prerequisites and additional requirements	ADMISSION AVERAGE	CEGEP Prerequisites and additional requirements	ADMISSION AVERAGE
Biomedical Mechanical Engineering	English or *Français*; Technical and Scientific Option[1] or Science Option[1] (Secondary V); Science and Technology (with or without option) (Secondary IV); Chemistry 504; Physics 504 **A combined minimum average of 84% is required for all prerequisite science and mathematics courses.**	84%	English (603) or *Français* (601); Biology (101) General Biology; Chemistry (202) General Chemistry or Organic Chemistry; Physics (203) Mechanics or Electricity and Magnetism; Mathematics (201) Calculus I **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	78% – 82%
Biotechnology (Biochemistry and Chemical Engineering) *For this program, you need to submit your admission application to the Faculty of Science.*	English or *Français;* Technical and Scientific Option[1] or Science Option[1] (Secondary V); Science and Technology (with or without option) (Secondary IV); Chemistry 504; Physics 504 **A combined minimum average of 84% is required for all prerequisite science and mathematics courses.**	84%	English (603) or *Français* (601); Mathematics (201) Calculus I; two of the following: Biology (101) General Biology, Chemistry (202) General Chemistry or Organic Chemistry, Physics (203) Mechanics or Electricity and Magnetism, Mathematics (201) Algebra I **A combined minimum average of 70% is required for all prerequisite science and mathematics courses. See www.science.uOttawa.ca for recommended courses.[2]**	65% – 69%
Chemical Engineering Mechanical Engineering	English or *Français*; Technical and Scientific Option[1] or Science Option[1] (Secondary V); Chemistry 504; Physics 504 **A combined minimum average of 84% is required for all prerequisite science and mathematics courses.**	84%	English (603) or *Français* (601); Chemistry (202) General Chemistry or Organic Chemistry; Physics (203) Mechanics or Electricity and Magnetism; Mathematics (201) Calculus I **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	78% – 82%
Civil Engineering	English or *Français*; Technical and Scientific Option[1] or Science Option[1] (Secondary V); Chemistry 504; Physics 504 **A combined minimum average of 84% is required for all prerequisite science and mathematics courses.**	84%	English (603) or *Français* (601); Chemistry (202) General Chemistry or Organic Chemistry; Physics (203) Mechanics or Electricity and Magnetism; Mathematics (201) Calculus I **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	76% – 80%
Computer Engineering Electrical Engineering	English or *Français*; Technical and Scientific Option[1] or Science Option[1] (Secondary V); Chemistry 504; Physics 504 **A combined minimum average of 84% is required for all prerequisite science and mathematics courses.**	84%	English (603) or *Français* (601); Chemistry (202) General Chemistry or Organic Chemistry; Physics (203) Mechanics or Electricity and Magnetism; Mathematics (201) Calculus I **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	70% – 74%
Computer Science Computer Science and Mathematics	English or *Français*; Technical and Scientific Option[1] or Science Option[1] (Secondary V) **A minimum average of 84% is required in the prerequisite mathematics course.**	84%	English (603) or *Français* (601); Mathematics (201) Calculus I **A minimum average of 70% is required in the prerequisite mathematics course.**	70% – 74%
Physics and Electrical Engineering *For this program, you need to submit your admission application to the Faculty of Science.*	English or *Français;* Technical and Scientific Option[1] or Science Option[1] (Secondary V); Science and Technology (with or without option) (Secondary IV); Chemistry 504; Physics 504 **A combined minimum average of 84% is required for all prerequisite science and mathematics courses.**	87%	English (603) or *Français* (601); Chemistry (202) General Chemistry or Organic Chemistry; Physics (203); Mechanics or Electricity and Magnetism; Mathematics (201) Calculus I **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	77% – 81%
Software Engineering (Offered with the CO-OP option only)	English or *Français*; Technical and Scientific Option[1] or Science Option[1] (Secondary V); Physics 504 **A combined minimum average of 84% is required for all prerequisite science and mathematics courses.**	84%	English (603) or *Français* (601); Physics (203); Mechanics or Electricity and Magnetism; Mathematics (201) Calculus I **A combined minimum average of 70% is required for all prerequisite science and mathematics courses.**	70% – 74%

[1] Students are required to take a make-up course in functions and/or calculus and vectors at the University of Ottawa either the summer before or during their first term.
[2] Past experience indicates that students with a strong background in biology, chemistry and physics have an increased rate of success.
To learn more on admission requirements for students coming from provinces or territories other than Ontario and Quebec, please visit www.uottawa.ca/admission.

CONTINUING YOUR STUDIES

Once you have completed your undergraduate program, you may want to consider pursuing your education at the graduate level.

The Faculty of Engineering provides its graduates with a top quality education in engineering and computer science, and offers a variety of masters and doctoral programs in various fields.

MASTERS AND/OR DOCTORATE DEGREES:

- Advanced Material Manufacturing
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Science
- Electrical and Computer Engineering
- Environmental Engineering
- Mechanical Engineering
- Engineering Management (MEng)
- E-Business Technologies
- Systems Science
- And many more…

ACCELERATED STREAM – *NEW*

You can complete your Honours BSc with Specialization in Computer Science and your Master of Computer Science within five years with the newly introduced Accelerated Stream.

For more information, visit **engineering.uOttawa.ca/about/programs.**

WANT TO TRY OUT RESEARCH AS AN UNDERGRADUATE STUDENT?

UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM

Sign up for the Undergraduate Research Opportunity Program (UROP) and explore cutting-edge research as a second or third year undergraduate student at the University of Ottawa. Work on unique and exciting projects, while defining your professional goals.

Not only do you have the chance to gain relevant experience and get to know your professors and peers, but you will also be paid for your work.

By participating in UROP, you will receive a $1,000 award and must devote, from October to March, at least 50 hours to a research project conducted by a Faculty of Engineering sponsor. There's no better way to learn and discover whether you want to continue on to graduate school.

For more information, visit **www.research.uOttawa.ca/urop.**

Photo credit: davidtaylorphotostudio.com

CHRIS FLIESSER
Third year, Chemical Engineering

The Undergraduate Research Opportunity Program (UROP) is an amazing experience for undergraduate students. By allowing students to work directly with professors on real research, the program gives them a chance to experience academia first-hand. I encourage all students interested in pursuing research to apply for UROP next term. It provided me with an excellent learning environment, and I'm sure that the skills I learned will help me throughout my career. In addition, the symposium held at the end of the term allows students to discuss their research with others and to share the wealth of information they've gathered. What is the purpose of research if it is not shared with the world?

KEEP IN TOUCH

Facebook.com/ uOttawa.Engineering

Twitter.com/ uOttawaGenie

Youtube.com/ FacultyofEngineering

HOW TO APPLY

1 Choose the program you want to study in the Faculty of Engineering. For more details on our different programs, visit: **engineering.uOttawa.ca.**

2 Check the academic admission requirements that apply to you.

3 Check application deadlines and complete any required admission tests.

4 Include all documents and forms needed for your application.

5 Track your application for admission via InfoWeb.

For more information on how to apply, please visit **www.admission.uOttawa.ca.**

SABA SHAIK
Fourth year, Computer Engineering

ETIENNE DUMONT
Fourth year, Computer Engineering

The Huawei Seeds for the Future Work Experience Program is a great opportunity for students to gain valuable experience in, and knowledge of, the telecommunications sector. This international experience gave us exposure to a global business environment and the latest technologies used in industry today. We first traveled to Beijing to learn about Chinese culture and history. We learned basic Mandarin and visited Tiananmen Square, the Forbidden City and the Great Wall. Our visits to these sites far exceeded our expectations. The view from the Great Wall was spectacular!

We then visited Huawei headquarters in Shenzhen, where we got hands-on training with Huawei engineers. We visited their labs, saw demos of advanced communications technology and also learned about Canada's contribution to Huawei's latest products. This helped us put Huawei and their products and services into perspective within Canada's ICT sector.

During our last stop, in Hong Kong, we visited the Consulate General of Canada to learn about the historical ties and current relations between Canada and Hong Kong. Learning about and experiencing Chinese culture and history helped us develop a broader view and new perspective of telecommunications. I was honoured to be a part of this program. It was an amazing experience that I'll never forget.

VISIT THE FACULTY OF ENGINEERING

We would be pleased to show you around our facilities. To make an appointment, send us an email at **genie.engineering@uOttawa.ca.**

You can also follow virtual tours of our Faculty's facilities at **engineering.uOttawa.ca.**

COME MEET US IN PERSON

September 25 to 27, 2015
Ontario Universities' Fair (OUF)
Toronto

October 30 and 31, 2015
University of Ottawa Days

March 19, 2016
Spring Open House

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