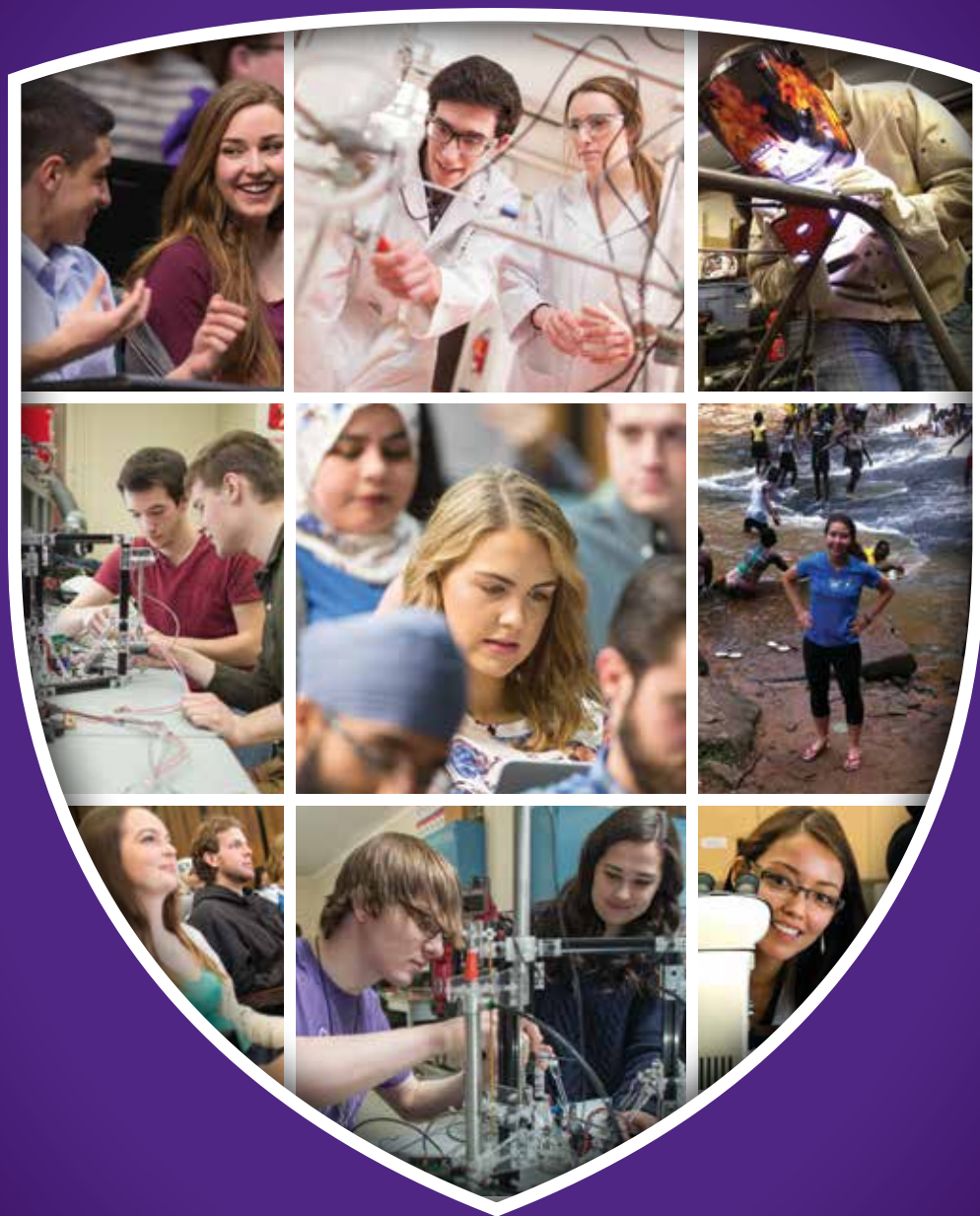


# Western Engineering



Engineering Viewbook 2018

# why western engineering?

**We deliver  
unique learning  
opportunities.**

**When you study at Western  
Engineering, you have the  
opportunity to develop your  
leadership and innovation skills.**



**Connect**



**Collaborate**



**Create**

**We offer a number of options to help  
you understand the important linkages  
between engineering and business,  
and provide solutions that will make  
a difference.**

In your common first year, you will be introduced to Business for Engineers, taught through a case-study based approach to learning. You can enroll in one of our unique upper-year options including the Engineering and Ivey HBA dual degree program, or the Engineering Leadership and Innovation Certificate. These opportunities can be paired with any of our engineering programs, providing you with the path to be successful in your future career.

By combining engineering with business knowledge, you will gain the fundamental skills to excel as a leader in your profession.



**ThreeC+** – A 100,000 sq. ft. building – will transform The Western Engineering Experience. Set to open in 2018, the new building will be a practical and inspiring place where undergraduate students integrate classroom theory with hands-on learning as they design, build, test and refine ideas.

**“Western Engineering feels like a family.** The collaborative and supportive environment inspires all of us to push ourselves past our comfort zones, whether it’s taking on a new challenge in the classroom, or getting involved in a club or team.”

**Elaine Cook**

Undergraduate Engineering Society President



Left to Right: Lauren Briens, Assistant Dean (First Year Studies); Michael Bartlett, Associate Dean (Undergraduate Studies); and Elaine Cook, Mechatronic Systems Engineering and Ivey HBA student, Undergraduate Engineering Society President.



# personalize your undergraduate engineering experience

**Mechatronic Systems Engineering** students **Jolien van Gaalen** and **Richard Lacroix** developed an affordable countertop hydroponic growing system for microgreens. The system, called **Migrova**, recently placed **first** in the **Innovative Design** category at both the **Ontario Engineering Competition** and the **Canadian Engineering Competition**.

**Join a club.  
Complete an  
internship.  
Go international.  
The choice is yours.**

When you join Western Engineering, you will be provided with the skills and knowledge to become a successful problem solver, prepared to address and find solutions to meet the needs of society.

As you start your academic journey towards becoming a Professional Engineer, we will provide you with the foundation you need to excel in your chosen career. You will be given the opportunity to shape your academic experience in flexible and exciting ways, creating courses of study designed to your individual interests and aspirations.

## The Western Engineering Difference

Western Engineering offers you unique possibilities. You can build your future at Western with co-curricular and experiential learning opportunities, including:

- Internships and Co-ops
- Dual Degrees
- Certificates
- International Experiences
- Leadership Opportunities

**The possibilities  
are endless.**



## Admission Requirements

### Ontario high-school students:

- » English (ENG4U)
- » Advanced Functions (MHF4U)
- » Calculus and Vectors (MCV4U)
- » Chemistry (SCH4U)
- » Physics (SPH4U)

Plus one other 4U or 4M level course (highest grade is chosen)

**Non-Ontario students:** please visit [welcome.uwo.ca/admissions](http://welcome.uwo.ca/admissions)

# your future begins here

## FIRST YEAR

### Home Away From Home

Western Engineering provides a strong community environment. When you start your academic journey with us, you will join a cohort of approximately 600 first-year students.

Professors will know your name and academic counsellors will be available to help you navigate and succeed through your university experience.

### Common First Year

When you start in September, your first-year academic counsellor will have your timetable ready for you.

With our common first year, you and all of your first-year classmates will take the same courses. We are excited by the response to our Business for Engineers course in the first-year curriculum. This addition recognizes the importance of a business perspective for engineering practice and creates multiple opportunities for further educational experiences while you are at Western.

Throughout first year, you will have the opportunity to participate in activities to help with your transition into university life. You can join clubs and teams, get to know your first-year classmates, and explore our engineering disciplines in more detail.

### Engineering Excellence Admission Program

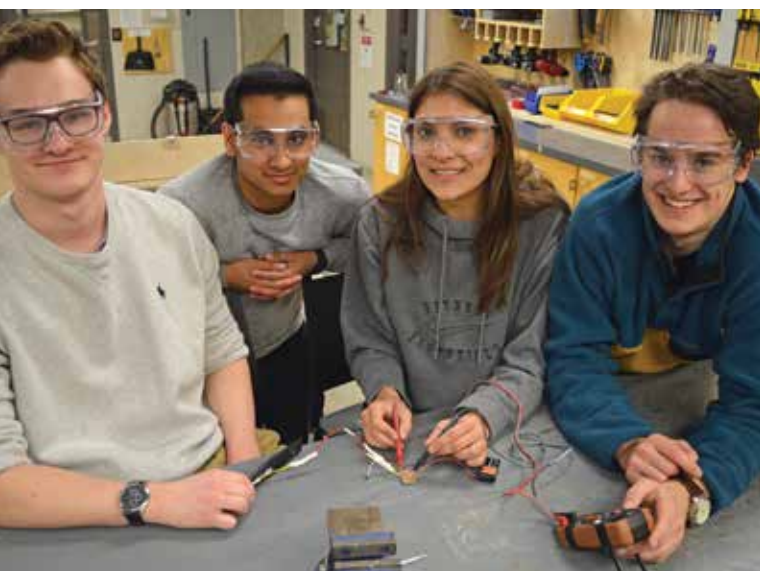
**Western Engineering will guarantee your acceptance into the program of your choice** (except Mechatronic Systems Engineering) after first year if you have a minimum entrance average of 85 per cent and maintain an average of 80 per cent in first year, with no failures, on a full course load.

### First Year Courses

- » Applied Mathematics – Calculus
- » Applied Mathematics – Linear Algebra
- » Business for Engineers
- » Chemistry
- » Computer Programming Fundamentals
- » Introductory Engineering Design and Innovation Studio
- » Physics
- » Properties of Materials
- » Statics



**Students are encouraged to complete a supplemental application form that gives them the opportunity to add to their academic profile and demonstrate their leadership potential, engagement and initiative, and passion for engineering.**



### Develop Solutions to Real-World Problems

#### SmartAxe

Changing temperatures can create a hazardous environment for winter athletes. Inexperienced users must “guess and hope” that their ice axe is safely embedded during their climb. Technology is embedded in the SmartAxe to provide safety feedback to the user.

Left to right: Jacob Hatton, Tausif Syed, Lena Szykowski and Owen Thurston

# the adventure continues

## UPPER YEARS



Following our common first year, you will major in one of our nine core engineering programs. All programs focus on design and innovation, with a capstone design project in your final year.

### Chemical Engineering

*(Options: Chemical or Biochemical and Environmental)*

Improve everyday living. Chemical engineers design, develop and operate chemical and biochemical processes to make products that everyone uses every day, such as plastics, polymers, medicines, foods, fuels, fertilizers, detergents, cosmetics, and consumer goods.

### Civil Engineering

*(Options: Structural, Environmental or International Development)*

Improve quality of life for people around the world. Civil engineers make communities safer places by providing essential infrastructure, solving environmental problems resulting from industrialization and resource consumption, and mitigating natural disasters.

### Computer Engineering

*(Options: Electronic Devices or Software Systems for Ubiquitous Computing)*

Design the next digital phenomenon. Computer engineers design hardware and build computer systems ranging from high-performance parallel supercomputers to micro-devices that will operate the next generation of cell phones, medical equipment, and video games.

### Electrical Engineering

*(Options: Wireless Communication, Power Systems, or Biomedical Signals and Systems)*

Power the future. Electrical engineers harness electrical energy for human benefit through applications such as telecommunications, digital electronics, computers, robots, generators, electric power distribution systems, and electric cars.

### Green Process Engineering

Change the world's carbon footprint. By reducing waste generation, green process engineers integrate the fundamental principles of chemical engineering to design commercial products and processes that are safe, economical, and environmentally friendly.

### Integrated Engineering

Become an innovation leader. Integrated engineers work across fields, recognizing and realizing opportunities by fostering and implementing practical solutions. Become well versed in management with a discerning eye for leading-edge innovations. Our Integrated program was redesigned to address the innovation gap by developing skills applicable to startups, SMEs, and large organizations in periods of change.

### Mechanical Engineering

Design a better tomorrow. Mechanical engineers use fundamental engineering concepts and contemporary design practices to develop new devices, materials, processes and systems, including smart materials, automotive and aerospace systems, conventional and alternative energy systems, and robotics and controls.

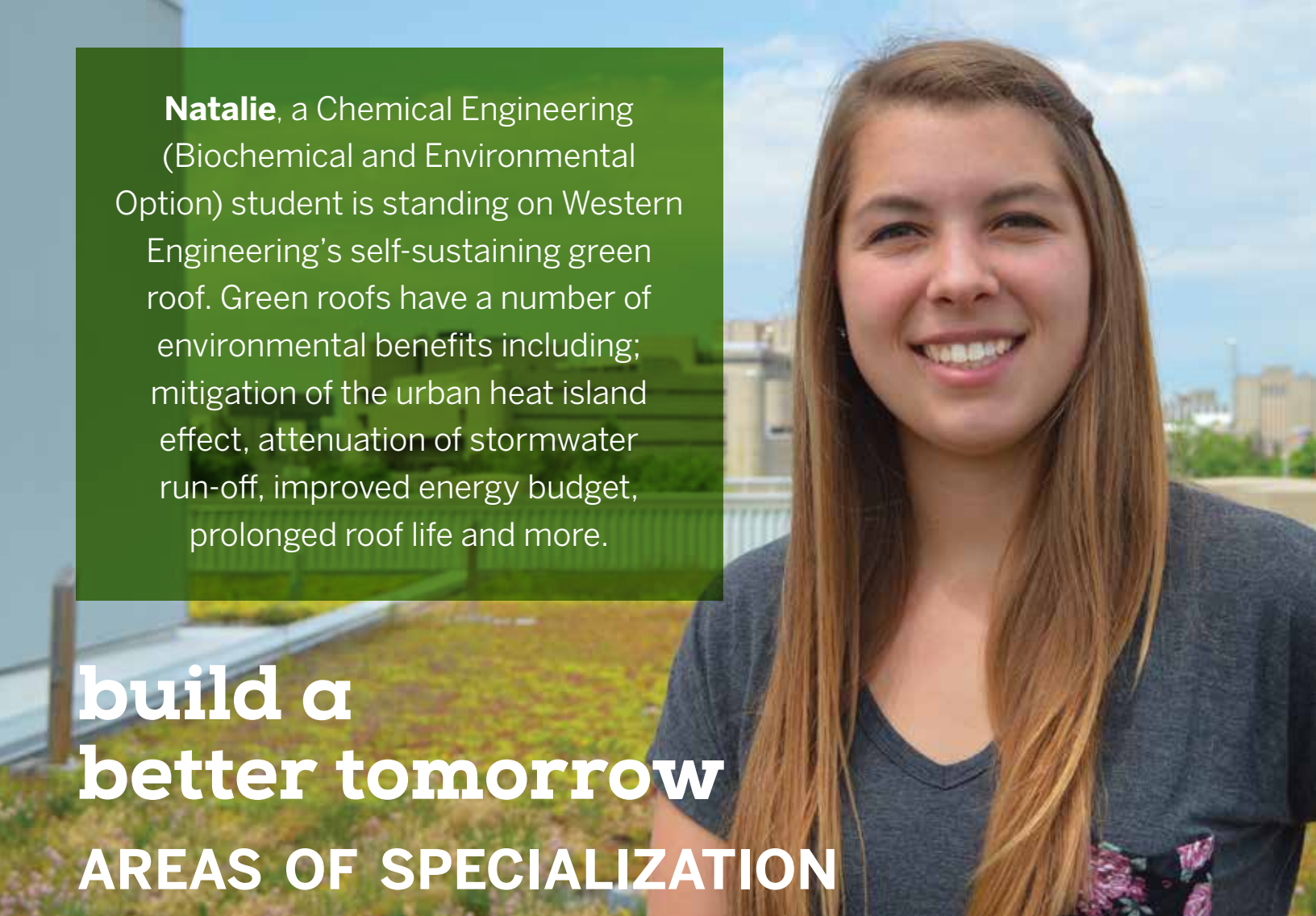
### Mechatronic Systems Engineering

Develop intelligent systems and devices. Mechatronic systems engineers combine mechanical, electrical, computer, control, and systems design to create smart solutions to everyday problems. Sensors and intelligent control enable more functional, reliable and versatile systems in areas such as healthcare, transportation, manufacturing, and household products.

### Software Engineering

*(Option: Health Informatics)*

Develop the next big thing. Software engineers specify, design, implement, and maintain innovative software systems. They apply both computer science and engineering principles and practices to create, operate, and maintain software systems.



**Natalie**, a Chemical Engineering (Biochemical and Environmental Option) student is standing on Western Engineering's self-sustaining green roof. Green roofs have a number of environmental benefits including; mitigation of the urban heat island effect, attenuation of stormwater run-off, improved energy budget, prolonged roof life and more.

# build a better tomorrow

## AREAS OF SPECIALIZATION

Address global challenges and turn innovative concepts into environmentally sustainable solutions at the undergraduate level. Study in Western's first LEED Gold (Leadership in Energy & Environmental Design) certified building, a state-of-the-art green learning environment.

Each area of specialization provides you with the opportunity to work with green-energy sources, manage resource consumption, and create better places for people to live now and in the future.

### **Chemical Engineering** (Biochemical and Environmental Option)

Combine a strong foundation in the fundamentals of chemical engineering, with further specialization in biochemical processes. Learn how to integrate engineering principles with knowledge of applied biology to design advanced biochemical systems for industrial and environmental applications.

### **Civil Engineering** (Environmental Option)

Become a steward to maintain and protect the environment. Ensure enhanced quality of life by designing and implementing environmentally sustainable methods to treat water and wastewater, dispose of solid waste, and manage water resources.

### **Civil Engineering** (International Development Option)

Explore the complex societal, environmental, political, and economic issues associated with building safer communities in Canada and in the developing world. Participate in an optional placement opportunity to work in developing countries or in-need communities in Canada.

### **Green Process Engineering**

Join a new era of engineers specializing in the creation and implementation of environmentally preferable, or 'green' approaches to the design and development of processes and products to meet society's needs. Explore alternative sources of energy with reduced carbon emissions.



# get involved

Western Engineering has an active Student Council — the Undergraduate Engineering Society (UES). The UES provides a student voice at various faculty meetings, organizes social events, and offers resources to support students.

**Join the Council.**  
**Get involved.**  
**Make a difference.**

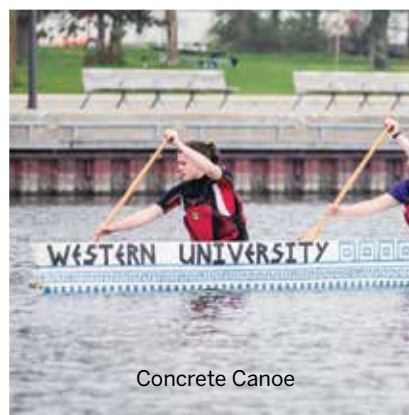
Every year, more than 500 Western Engineering students participate in faculty-based groups, clubs and teams, as well as University-wide programs, and volunteer opportunities across the City of London. By participating in extracurricular activities, you will develop leadership skills, gain hands-on engineering experience, and build a new network of friends.



Aero Design



Women in Engineering



Concrete Canoe



Western Formula Racing Team

# innovation starts here

Western Engineering students and alumni excel as innovative leaders. Bring your ideas to life through entrepreneurship, design, and technical expertise.



Engineering students **Justin Lam**, left, **Armin Gurdic**, **Danny Loo** and **Aidan Sabourin** created an app, **Bottle Flip 2k16**, that attracted millions of downloads, becoming the top download in nearly 20 countries.



Western Engineering student **Alan Kalbfleisch** was awarded \$5,000 from **Propel's Seed your Startup** pitch competition to launch his venture Pascal Press — an all in one pressure brewer and travel mug that allows you to make high-quality coffee on the go.



**Laura Smith, BESC/HBA'14** used both the technical and business skills she developed through a dual degree in engineering and business as the foundation to build her startup company **Pout Inc.** — a social network for fashion and beauty.



## Seed your Startup

**Propel** – Western's entrepreneurship centre – will help you transform your innovative ideas into action.



“Individuals who combine engineering with business will lead organizations in creating real value for customers and society. We work to create unique opportunities to develop the full potential of today’s student.”

**Darren Meister**

John M. Thompson Chair in  
Engineering Leadership and Innovation

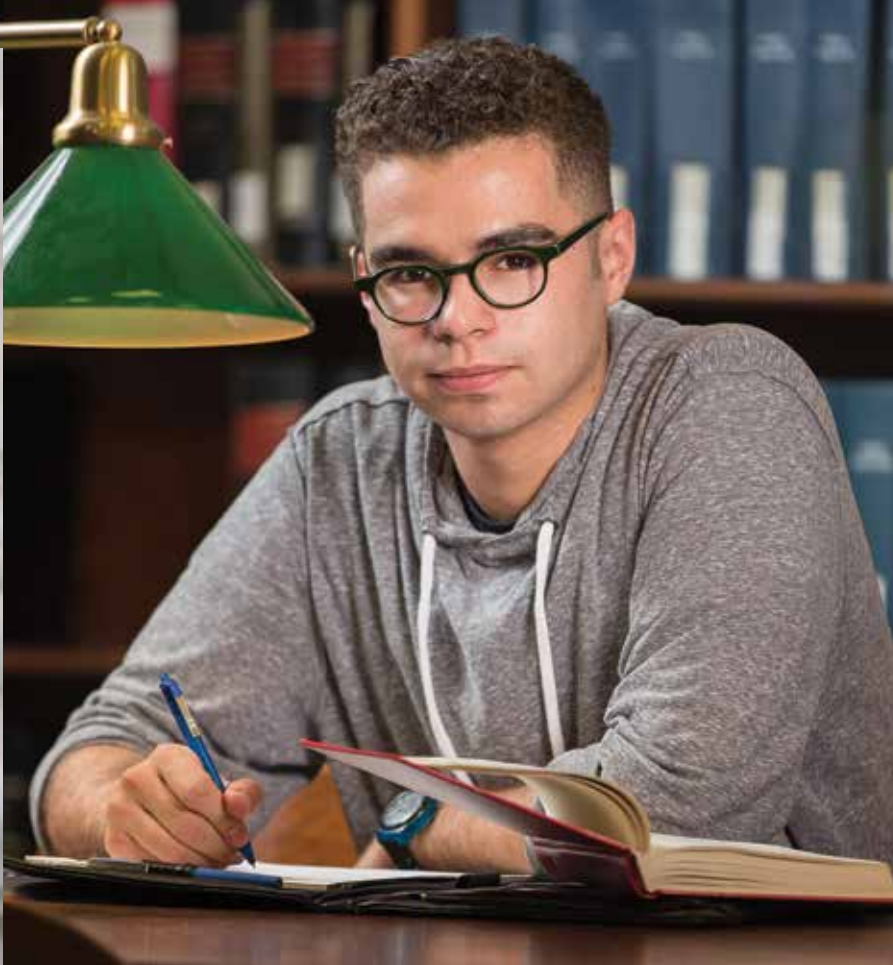
## be a leader      engineering + business = entrepreneurial success

“The **Engineering and Business dual degree** has allowed me to combine the two things I am most passionate and interested in to further develop my knowledge in both areas. It has provided me with an analytical engineering skill set, along with fundamental business knowledge and judgement that is extremely valued in a wide range of industries. This unique combination of Chemical Engineering and Business has expanded my career options and allowed me to stand out to employers.”

**Yara Ibrahim**

Engineering and Ivey HBA student





“I always had a love of computers, technology, and learning how the things around me worked, but I also enjoyed politics and history. Engineering at Western gave me the opportunity to combine my interests, and a practical education that I know will be an important part of my professional life. As an engineering student, I have knowledge of the inner workings of new technology which will be a great asset to me as a future lawyer.”

**Jacob Green**

Electrical Engineering and Law student

## The evidence is in: Dual Degrees will give you an edge.

**Western Engineering offers opportunities that allow you to graduate with two full degrees in less time than it would take to complete them individually.**

A dual degree gives you a competitive edge towards a rewarding career. You will have the engineering skills and knowledge to become a successful problem solver who is prepared to find solutions to current and future problems around the world in a traditional engineering career or profession of your choice.

### Engineering and Ivey HBA

Addressing today's global, economic, and environmental challenges requires people who are able to find creative yet practical solutions. In just five years, you are prepared to be a technology-proficient leader by combining an Honors Business Administration (HBA) degree at the Ivey Business School with your Bachelor of Engineering Science (BESc) degree.

### Engineering and Law

Unique in Canada, the dual degree with Western Law allows you to complete a Juris Doctor (JD) with a Bachelor of Engineering Science (BESc) in six years. This program gives you the legal and engineering knowledge and skills to meet industry demands and solve societal problems.

### Biomedical Engineering

We are looking forward to offering dual degrees that combine Biomedical Engineering with Chemical, Electrical or Mechanical Engineering. These combinations extend core engineering disciplines to the design and analysis of medical devices and the application of engineering to solve problems in medicine and biomedical sciences.

### Engineering and Your Passion

We also offer more than 50 other dual degrees involving a major module in faculties such as Science, Music, Social Science or Arts & Humanities so you can pursue all of your passions in life.

# gain work experience

**While completing your engineering degree, you are encouraged to participate in a year-long Internship and/or Summer Engineering Co-op. You will earn money and gain extremely beneficial work and networking experience. Internship and Co-op opportunities are available with local, national, and international employers.**



“I chose to participate in an internship at a natural gas company after my third year. I had the opportunity to learn how the corporate world works, and to hone my soft skills like public speaking, technical writing, and time management. After my internship, I came back to my final year of school with a renewed sense of purpose and direction for the kind of career I would like to pursue after graduation.”

**Mai Abdou**  
Chemical Engineering  
Union Gas Ltd.

# 2017 AVERAGE SALARIES

**\$45,000/yr**  
(Internship)

**\$19/hr**  
(Co-op)

## Internship

Gain a competitive advantage over other engineering graduates by completing a year-long Internship before the last year of your engineering degree. Throughout your placement, you will have the opportunity to work on advanced engineering projects from start to finish.

## Summer Co-op

Gain valuable engineering and career-related work experience during the summer months (May to August) to enhance and build on the skills acquired during your engineering degree. Co-ops are flexible — you can complete one every year starting in the summer after first year, or choose to complete just one during your time at Western.

## Transportation Career Development Program

Broaden your knowledge of design and construction through this program. A government agency, a consulting company, and a contractor have formed a partnership to hire three first-year students interested in Civil Engineering to rotate between the organizations during each summer of their first, second, and third year.

## Career Services Office

Western Engineering's Career Services Office offers résumé and cover letter review, interview preparation, and career planning meetings to assist you. These services are available to all students, making the transition from university to the workforce as stress-free as possible.

## Where do our students work?

3M Canada  
Aecom  
ArcelorMittal  
GE Canada  
General Dynamics Land Systems  
General Motors  
Google  
Honda  
Husky Energy Inc.  
Hydro One  
IBM Canada Ltd.  
Imperial Oil Limited/ExxonMobil Companies  
Labatt Brewing Company  
Linamar Corporation  
Magna International  
Microsoft  
NOVA Chemical Corporation  
Ontario Power Generation  
Pratt & Whitney Canada  
RBC  
Siemens Canada Ltd.  
Stantec Consulting  
Suncor Energy Inc.  
Toronto Hydro  
Union Gas Ltd.  
WSP Canada Inc.  
Local, Provincial, and Federal Government Agencies  
*... and many more!*

# enhance your engineering education



“Being able to observe, participate, and contribute in the electrical engineering field through a co-op was a great opportunity to gain hands-on experience. This opportunity has left me more prepared for future challenges both at university and at a future internship/job.”

**Vladislav Svarc**

Electrical Engineering  
and Co-op student at BUCK Lighting

## Engineering Leadership and Innovation Certificate

Enhance your undergraduate education with entrepreneurial knowledge and innovation skills by earning the Engineering Leadership and Innovation Certificate. Students who complete this certificate will acquire practical experience in the creation of new products and services, within startups and established companies. Students will learn how business and engineering perspectives reinforce each other to create long-term value and benefit through the implementation of emerging technologies.



## Practical Elements of Mechanical Engineering Externship

Western Engineering has collaborated with Fanshawe College to provide you with valuable hands-on experience through an externship. After first year, you can complete a four-month externship to earn an Ontario College Local Certificate, and, after completing a second four-month term, an Ontario College Graduate Certificate. Practical courses include machining, welding and metrology, plus mechanical engineering skills. This externship complements your technical knowledge with hands-on experience.



## Global and Intercultural Engagement Honor

The Global and Intercultural Engagement Honor will recognize your experience and engagement in achieving global and intercultural competencies while at Western. The Honor will appear on your official transcript upon graduation. This is your chance to receive formal recognition for gaining a global perspective while creating an international network.



## International Learning Award

At Western, the world is your classroom. Every student with a cumulative 80% average at the end of Year 2 will receive a \$1,000 award to complete an international learning experience in third year.

# internationalize your western engineering experience

Each year, Western Engineering welcomes students from across Canada and from around the world. More than 50 countries are represented in Western Engineering's undergraduate and graduate programs. We are committed to diversity and inclusion by providing a welcoming environment to all students.

**Travel. Learn a new language.  
Gain global experience. Help people in need.**

Engineers often work for multi-national companies and face opportunities that require a broader vision, communication across cultures, disciplines and languages, and an understanding of other societies and cultures. There are many paths at Western Engineering to prepare you for global impact.

## Global and Intercultural Engagement Honor

Western Engineering students have experienced international engagement by travelling to China, Dominican Republic, England, France, Germany, Ghana, Peru, and other countries.

## Civil International Development Program

In this program, you will specialize in applications to address complex societal, environmental, and economic issues and infrastructure problems for communities in developing countries. You can also complete a Summer Community Development Placement to gain technical engineering experience in the context of development.

## Engineers Without Borders (EWB)

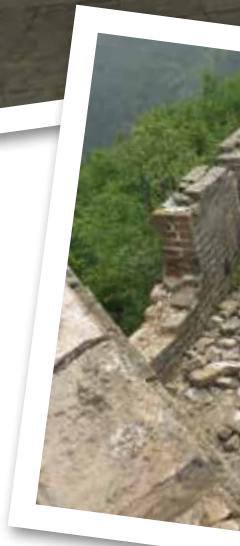
EWB promotes human development through increasing access to technology to help communities around the world improve their standard of living. Western's EWB branch has a great variety of portfolios, including advocacy, fair trade, youth and public engagement, as well as a fantastic creative team.

## International Exchange

You can complete part of your degree overseas with an international exchange. In third year, you will have the option to travel and live abroad while pursuing your studies through academic international exchanges.

## Diverse Community

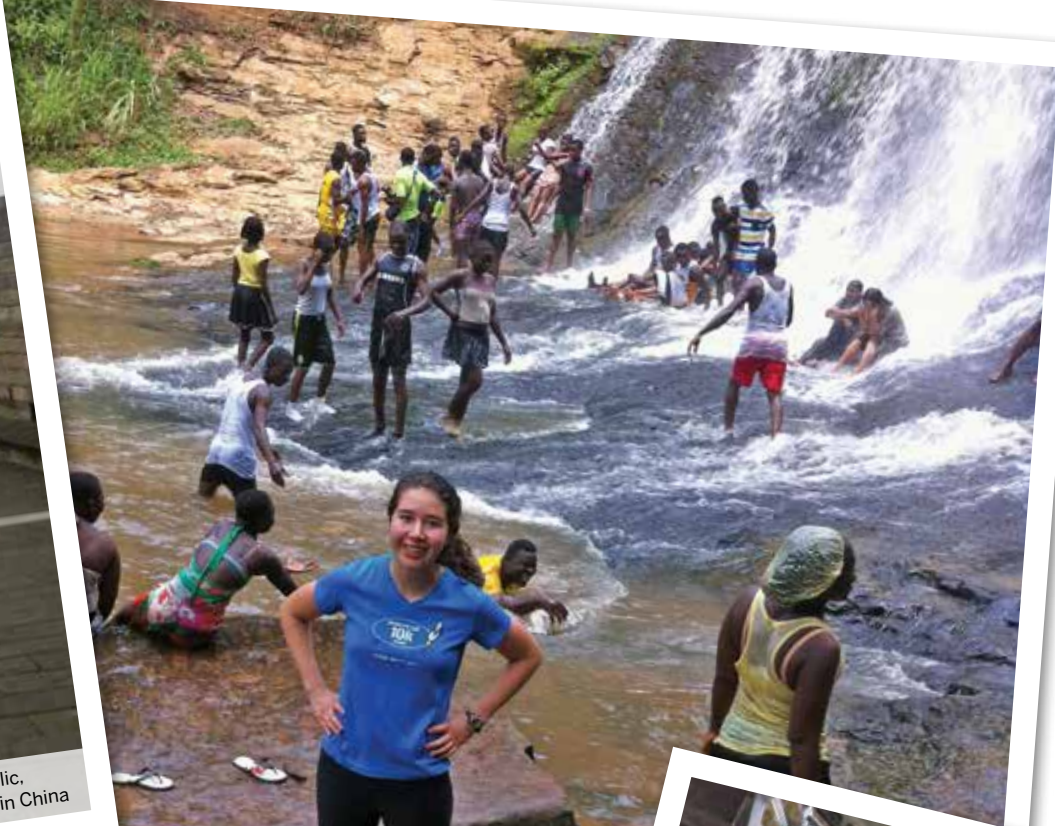
Western Engineering offers a welcoming environment to all students pursuing an engineering degree. We offer great services and support for international and female students.



Adrienne Dao, Mary Ames, Jordan Auzam, Jamie Leidl in China



Carl Botha, Ena Mulalic,  
Katherine Lawrence in China



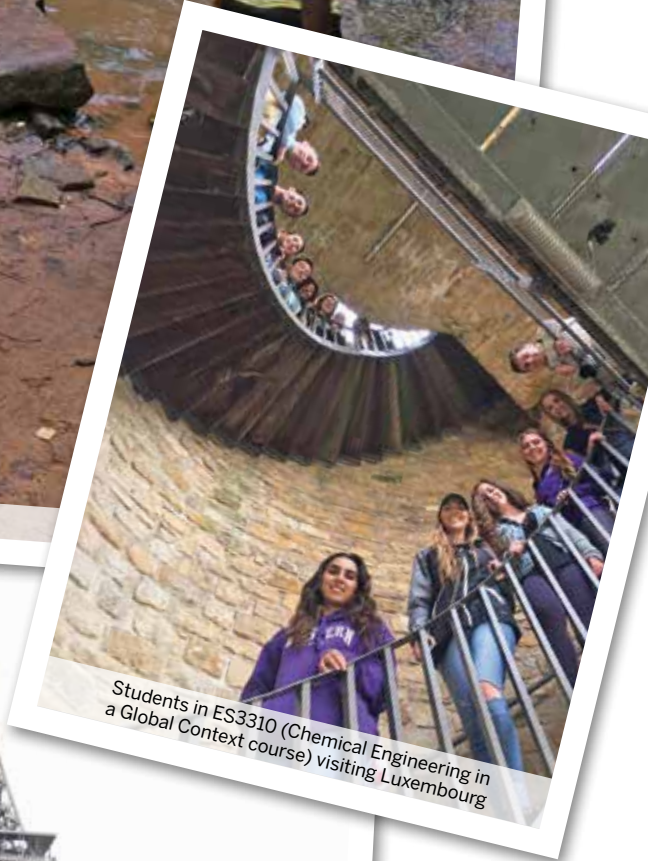
Hilary Stone in Ghana



Jordan Auzam and Adrienne Dao in China



Jaeleah Goor in Ghana



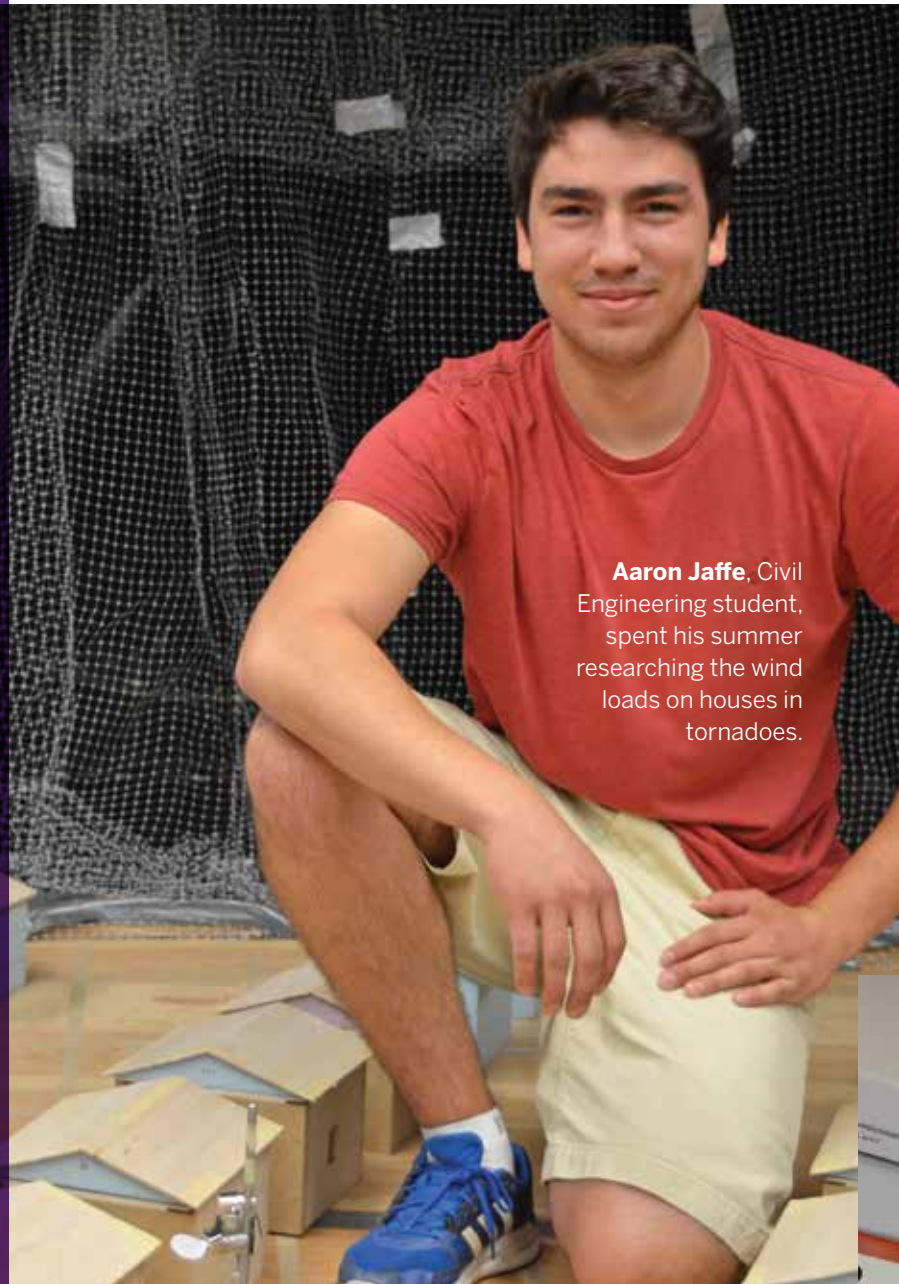
Students in ES3310 (Chemical Engineering in  
a Global Context course) visiting Luxembourg



Students in ES3310 (Chemical Engineering in a Global Context course) visiting Eiffel Tower in Paris, France

# shape the future

Western Engineering is committed to making the world a better place. Our academic programming and strategic goals have a strong emphasis on sustainability, improving the health-care system, mitigating the effects of natural disasters, and increasing diversity in the field of engineering.



**Aaron Jaffe**, Civil Engineering student, spent his summer researching the wind loads on houses in tornadoes.

## Research with Impact

At Western Engineering, we conduct research directed towards benefiting society. Our leading-edge research provides the foundation for graduate student training and undergraduate learning. Our faculty members are actively involved in projects at the frontier of knowledge. Their expertise is brought to you in the classroom and is applied in industry every day.

As an undergraduate student, you will have ample opportunities to participate in research. For example, you could start the **Accelerated Master's Program** during your fourth year of study, allowing you to complete graduate courses in lieu of technical electives, which simultaneously satisfies requirements for your bachelor's degree and the beginning requirements of your master's degree. The Accelerated Master's Program allows you to complete a master of engineering science degree in just one year beyond your bachelor's degree.

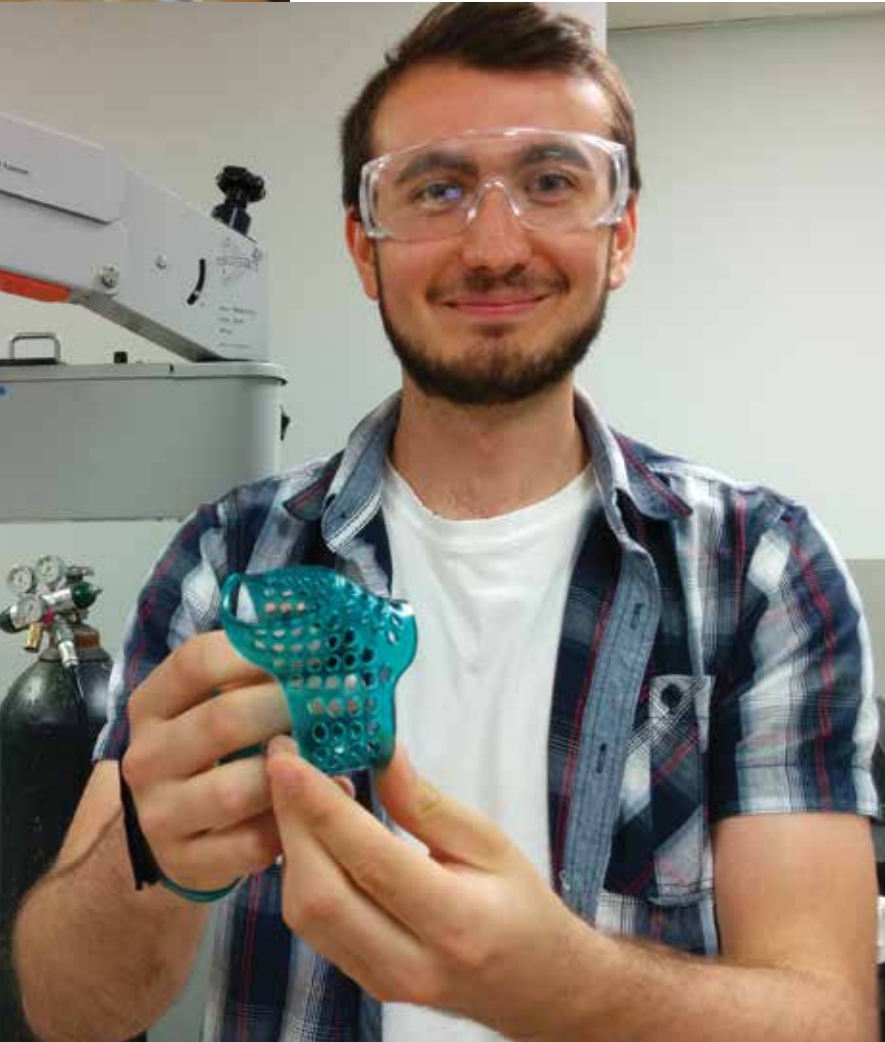
You can also apply for research fellowships and awards such as the **NSERC Undergraduate Student Research Awards**, or complete an internship or co-op with one of our leading-edge research centres and institutes, including the:

- Boundary Layer Wind Tunnel Laboratory
- Fraunhofer Project Centre for Composites Research at Western
- Geotechnical Research Centre
- Innovation Centre for Information Engineering
- Institute for Chemical and Fuels from Alternative Resources
- International Composite Research Centre
- Particle Technology Research Centre
- Wind Engineering, Energy and Environment Research Institute



### Conduct research at the undergraduate level

**Claire Lizotte**, a Mechatronic Systems Engineering student, is conducting research focused on new cutting-edge health-care solutions. Working alongside faculty members and graduate students, Claire's research has the potential to impact procedures in minimally invasive surgeries and decrease recovery time for patients.



“This research is an incredible experience. The amazing people, the unique opportunity to help others and the fascinating research make learning a pleasure.”

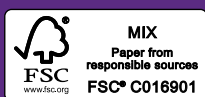
**Robert Potra**  
Mechatronic Systems Engineering student

As a summer research assistant, Mechatronic Systems Engineering student **Robert Potra** is conducting research using laser scanning technology to create patient-specific 3D printed splints. The goal of the research is to help patients with chronic conditions by providing personalized health-care solutions.



# join our network of extraordinary alumni

When you graduate from Western Engineering you will join a network of 13,000+ alumni who are working locally, nationally and internationally as business and innovation leaders.



## **Fall Preview Day**

Sunday, November 12, 2017

## **March Break Open House**

Saturday, March 10, 2018

For more information about upcoming events, visit:

[eng.uwo.ca/future\\_undergrad](http://eng.uwo.ca/future_undergrad)

---

## **Undergraduate Services**

Spencer Engineering Building  
Room 2097

Western University  
London, ON CANADA  
N6A 5B9

519.661.2130

[futurewe@uwo.ca](mailto:futurewe@uwo.ca)

[www.eng.uwo.ca](http://www.eng.uwo.ca)

Information for parents:

[welcome.uwo.ca/parents](http://welcome.uwo.ca/parents)



# Western Engineering