



Faculty of Engineering

Welcome!

Earning an engineering degree from UWindsor will help you make the world a better place in many rewarding ways.

The University of Windsor is proud of its mission of enabling people to make a better world through education, scholarship, research and engagement.

As an engineer, you will have an opportunity to contribute by helping to plan communities, provide clean drinking water, build bridges, or design an automobile. Engineers use their knowledge to creatively solve the practical problems that face our society.

Your education will begin with a broad base of fundamental science, mathematics and engineering

knowledge in courses that are common to all programs. Our curriculum emphasizes analysis, synthesis and design. In fourth year, you will undertake a design project working closely with a faculty advisor.

In fall 2012, we will welcome our first class into our new, \$112-million, state-of-the-art Centre for Engineering Innovation. We hope that you will join us!

“The Engineering co-op program really **enhanced my employment skills.** During my co-op placement with Chrysler Canada, I worked on fuel economy and emission control. In my **co-op** with Canadian Tire Corporation, I was involved in the construction of its largest distribution centre in Canada. I have **accepted a position** with Canadian Tire in Toronto as a supply chain analyst.”

Devender Kainth, fourth year,
mechanical engineering
(automotive option)





DID YOU KNOW?

The University of Windsor's unique climate of co-operation between academic, business and industry sectors gives you access to state-of-the-art engineering facilities and outstanding career opportunities.

Programs of Study

The University of Windsor offers five accredited engineering degree programs that provide you with rewarding career prospects in a variety of professional disciplines.

Our graduates have excellent problem-solving skills and are employed in industry, government, private practice, and as consultants. Some even take further studies in medicine, law, and business here, building on the excellent educational foundation they received through their engineering degree. Our programs are accredited nationally by the Canadian Engineering Accreditation Board.

First-year Engineering

All students accepted directly* into the Faculty of Engineering attend the same courses in their first year, whether or not they have declared their program of choice. These courses will provide you with the basic foundation needed to learn and appreciate advanced subjects in the engineering field of your choice. You will study topics such as mathematics, physics, computing applications, and engineering mechanics. You will also study issues related to the professional development of your future career: professional conduct, law and ethics, and how modern issues influence the practice

of engineering. This way, you can familiarize yourself with the areas that most interest you. You can even switch programs before you start second year, which is just one of the ways in which we try to accommodate our students.

After first year, you will have your choice of pursuing civil, environmental, mechanical, electrical, or industrial engineering. All of our programs offer different options or specialized courses allowing you to focus on unique topics that suit your interest.

Civil and Environmental Engineering

Bachelor of Applied Science (Honours)

The Department of Civil and Environmental Engineering offers two separate degree programs: Civil Engineering and Environmental Engineering. Both programs are similar in many respects, but each offers its own unique strengths. Civil and environmental engineers design, construct and manage bridges, highways, skyscrapers, transportation networks, water systems, and

* Some students may not meet all the requirements to enter directly into our faculty. We may ask them to fulfill certain conditions prior to accepting them into the engineering program.

environmental facilities, as well as engineering and management systems to protect and remediate our air, water, and soil. With the renewed interest in how to make our world more sustainable and the need to repair and rehabilitate our aging infrastructure, civil and environmental engineers are applying their knowledge and expertise to reduce the impact of human activities and to improve the quality of life for people around the world.

Civil Engineering

As a civil engineer, you will play a critical role in designing, upgrading, and maintaining infrastructure. Traditionally, civil engineering included such projects as buildings, roads, and bridges. Modern civil engineers, however, also look after many demanding 21st century infrastructure projects. Power generation facilities, airports, hydroelectric dams, intelligent transportation networks, and water supply systems are just a few examples.

After first year, you will start to specialize in courses such as soil mechanics, the mechanics of deformable bodies, fluid mechanics, construction management, as well as design of structures made of wood, concrete and steel. Our program is flexible and provides a great variety of career opportunities, as well as the ability to pursue a minor in science or business.

Environmental Engineering

We are proud to say that the University of Windsor offered the first environmental engineering degree

program in Canada. We continue to be at the leading edge in education and research. Environmental engineers use chemistry, biology, and engineering principles to solve air, water, and land pollution problems. Known for their flexibility and multidisciplinary approach to creating solutions, environmental engineers work with industries and governments, as well as agencies such as the World Health Organization to reduce the impacts of global warming, acid rain, and ozone depletion. Environmental engineers design municipal water supply and industrial waste water systems, but also work in emerging fields such as vehicle recycling, developing bio-based hydrogen and ethanol fuels, environmental forensics, and alternative energy generation. After your first-year studies, you will start to specialize in courses such as air pollution, water pollution control, chemical reaction engineering, environmental microbiology and environmental assessment. Many of our past graduates are passionate about biology, ecology, or human health, and chose environmental engineering as a unique way to pursue their interests while obtaining a recognized professional degree.

Electrical and Computer Engineering

Bachelor of Applied Science (Honours)

Electrical and Computer Engineering offers you a diverse range of exciting opportunities in high-tech industries. As an electrical engineer, you will design communications systems,

electrical power grids, circuits, electric motors, electronic sensors, and many more of the technologies and applications that are so important to society today. You may work as a communications engineer, computer engineer, or microelectronic engineer in positions found with government and industry.

After first year, you will take courses in numerical programming, circuit analysis, digital design, electromagnetic fields and photons, signals, and physical electronics. Third- and fourth-year courses include microprocessors, analog communications, intelligent computing, power electronics, computer networks and security, wireless communications, and digital computer architecture. But don't forget to get involved with student activities! For example, the Institute of Electrical and Electronics Engineers has an active student chapter on campus which includes the Women in Engineering Affinity Group.

In fourth year, you can select technical electives that focus on Communications, or Computer Engineering, or Electronics, or a cross between various areas of interest:

Communications

Communications courses will interest you if you want to work in fields of advanced conventional and wireless telecommunications and signal processing.

Computers

Courses that focus on computing engineering will provide you with the skills needed to design computer technologies. You can also work with computer-related technologies in fields such as multimedia and intelligent systems.

Electronics

Interested in the exciting world of integrated circuits? Consider our courses that focus on electronics and their applications. These will prepare you to work with applications such as automotive electronics, power electronics, and microelectromechanical systems.

Industrial and Manufacturing Systems

Bachelor of Applied Science (Honours)

The University of Windsor is one of only a few in Ontario to offer industrial engineering. Our Department of Industrial and Manufacturing Systems Engineering will prepare you – the next generation of industrial engineers – to answer the needs of organizations to operate efficiently and cost effectively. As an industrial engineer, you may use intelligent processes to streamline production systems, design flexible manufacturing approaches, and you will use a wide range of knowledge to do so, including operations research, manufacturing sciences and enterprise resources planning/integration.

Our graduates tackle technical, human, information, and financial challenges faced by companies. They are employed by manufacturers, banks, railways, airlines, insurance

companies, hospitals, and retailers to help to improve the cost and services of all functions.

Some of the typical responsibilities of graduates include:

- Automotive assembly and design
- Manufacturing-driven product design
- Facility engineering layout and planning
- Robotic material handling and welding
- Corporate logistics
- Warehousing
- Inventory management
- Manufacturing ergonomics
- Human factors in product design

Industrial Engineering with a Minor in Business Administration

Bachelor of Applied Science (Honours)

This integrated business/engineering curriculum, developed by the Odette School of Business for the industrial engineering program, will prepare you for management and leadership careers in industry and manufacturing within four years.

Mechanical, Automotive and Materials

Bachelor of Applied Science (Honours)

The Department of Mechanical, Automotive and Materials Engineering offers a multi-faceted program where you tackle real-world problems, interact with local industry, and enjoy a hands-on experience. Windsor is known as the Automotive Capital of Canada, but we have many more industries regionally that provide manufacturing and engineering services. As a result, we can offer our mechanical, automotive, and materials engineering students

some of the best opportunities to interact with industry while they are students. Our faculty members work with some of the world's leading corporations to provide you with opportunities for industry focused learning and research.

Mechanical, Automotive, and Materials Engineering graduates can be found at all levels of management from smaller, private companies to larger, multinational corporations, and government ministries and services. They apply their knowledge and skills across a number of industries, including automotive, power generation, aerospace, and manufacturing equipment. In third year, our program allows you to attend advanced courses in mechanical engineering if you choose to stay in the General Program, or to specialize in one of four option programs: Automotive, Materials, Environmental, and our newest option, Aerospace.

General Program

The field of Mechanical Engineering includes two broad areas of study. The first involves heat and power, and is referred to as thermofluids. The second involves the study of solid mechanics, which includes designing mechanical parts, determining the forces on those parts during operation and analyzing their performance as part of larger machines and systems. The general field of mechanical engineering is very diverse, and you will apply your knowledge of thermofluids and solid mechanics to the design of large-scale systems, including power plants, turbine engines, and air-conditioning. You can choose to stay in the General stream and not declare an option.

Aerospace Option **NEW!**¹

Our newest option takes advantage of the Windsor region's focus on aerospace manufacturing expertise and new ventures into aircraft maintenance. You will learn about the fundamentals behind aerospace design, and especially the manufacturing, maintenance, and logistics involved in serving the aerospace industry. The skills you will acquire will help develop the next generation of aerospace materials, production methods, and components in order to meet the demanding future challenges posed by aerospace operations.

Automotive Option

As Canada's premier automotive university, we offer an Automotive Option in Mechanical Engineering. This is one of our most popular engineering choices. The Faculty of Engineering is closely connected to Canada's largest industry through unique research and teaching partnerships with leading companies in the automotive sector. You begin studying alongside your classmates in courses common to all Mechanical, Automotive, and Materials engineering students, but soon study topics such as vehicle dynamics, internal combustion engines, diesel technology, and fuel cell technologies. A highlight for students taking this option is the opportunity to design, build and race vehicles in events sponsored by the Society of Automotive Engineers as part of their fourth-year design project. These include the Formula and Baja vehicles, aeroglidors, and high-fuel efficiency vehicles. After

graduation, our students have been employed with all of the automotive companies, specialty design firms, and even racing teams!

Environmental Option

Enjoy working with mechanical systems but interested in the environment? Consider the Environmental Option. You will receive the in-depth training that all other mechanical engineering students receive, but your technical electives will focus on subjects such as water/wastewater treatment, noise control and abatement, environmental assessment, and recycling and materials recovery. Companies deal increasingly with environmental issues and often seek ways to design out pollution before it becomes a problem. You may be involved in a design team or a group of consulting specialists where the mechanical design requires considering environmental issues and green concepts.

Materials Option

Choosing the right material makes all the difference when it comes to high-performance machinery. Mechanical engineering students who choose the Materials stream will evaluate the structure and properties of metals, ceramics, polymers and composites to optimize designs. You will have an opportunity to work with processes such as casting, injection molding, and welding, through course work and fourth-year design projects. Careers for materials engineers range from design to quality control in manufacturing and high-technology sectors.

Bachelor of Engineering Technology²

The University of Windsor's Faculty of Engineering has launched a new program in Engineering Technology that will prepare its grads for the job market with hands-on experience. The program can be completed in three semesters. This is a program for you if you meet one of the following requirements:

- a) A three-year Canadian college technology diploma holder or an equivalent overseas institution
- b) An engineering degree from an accredited Canadian university or an equivalent overseas institution
- c) A four-year university degree in a scientific or technical subject from a Canadian University or an equivalent overseas institution

Common positions for graduates include product design, testing, development, systems engineering, field engineering, technical operations, and quality control.

Honours Certificate in Electrical Engineering³

Our innovative Honours Certificate Program was designed for engineering, computer science or physics graduates from Canadian and Internationally recognized universities who are seeking additional expertise related to Electrical Engineering. The Honours Certificate Program provides a pathway to further career advancement by providing courses and a recognized route to upgrading previous academic attainments to the high levels required for entry into graduate programs.

¹Approval in progress

²Designed for college transfer students; this is a terminal degree; inquiries are welcome

³ This certificate is intended to upgrade an undergraduate engineering degree and/or prepare the student for an MASc

Academics

What your first year would look like

In your first year, you will learn and explore subjects important to engineering, including:

- Forces and their interactions
- Motion and movement
- Electricity and magnetism
- Mathematics and its applications
- Design and graphical communications
- Chemical and material interactions
- Technical communications
- Professional issues in the engineering disciplines

It's a challenging but highly rewarding curriculum, and you will be well prepared for your future years of study. Keep in mind that regardless of what program you choose to study after first year, you have the same courses in first-year engineering. You can enter as an undecided student and choose your specific program later. Or, if you've already decided on a specific field but change your mind, we can accommodate that before your second year.

Check out our website: www.uwindsor.ca/engineering and click on Academic Programs/WINONE/First Year for details and the latest information.

Admission requirements

DEGREE TITLE/PROGRAM	LIMITED ENROLLMENT YEAR 1	MEAN ADMISSION AVERAGE	ONTARIO COURSE REQUIREMENTS NEW ONTARIO CURRICULUM
Bachelor of Applied Science, BAsC Engineering - General Engineering - Civil Engineering - Electrical and Computer Engineering - Environmental Engineering - Industrial Engineering - Industrial with a Minor in Business Administration Engineering - Mechanical Engineering - Mechanical (Aerospace Option) Engineering - Mechanical (Automotive Option) Engineering - Mechanical (Environmental Option) Engineering - Mechanical (Materials Option)	74% +74% in Engineering Second average	85%	ENG4U, MHF4U, SCH4U and SPH4U required. MCV4U is strongly recommended. Co-op available – apply during Year 1 at University of Windsor.

Scholarships

UWindsor offers a range of awards and financial aid programs to encourage and recognize academic achievement.

Renewable Entrance Scholarship

80 – 83.9%	\$400/term, renewable for up to a total of 8 terms
84 – 86.9%	\$600/term, renewable for up to a total of 8 terms
87 – 89.9%	\$800/term renewable for up to a total of 8 terms
90 – 93.9%	\$1,250 /term, renewable for up to a total of 8 terms
94 – 95.9%	\$1,500/term, renewable for up to a total of 8 terms
96 – 97.9%	\$1,750/term, renewable for up to a total of 8 terms
98 – 100%	\$2,000/term, renewable for up to a total of 8 terms

To renew an Entrance Scholarship, you must be registered full-time and maintain an A- cumulative average.

Outstanding Scholars Award

Depending upon your academic average, you could be eligible for the University's Outstanding Scholars Program, open to all engineering disciplines. The program's intent is to build leaders or mentors, and reward academically strong students. Recipients of the Outstanding Scholars Award are also mentored in their first year in preparation for appointments to faculties. To maintain eligibility, students must achieve a minimum A- at the end of each semester along with other criteria.

www.uwindsor.ca/outstandingscholars/eligibility

INCOMING SCHOLARSHIP AVERAGE	AWARD (per term)	GUARANTEED APPOINTMENT* (per term, beginning in term 3)	MAXIMUM VALUE
85 - 89.9%	\$750	\$1,000	\$12,000
90 - 94.9%	\$1,000	\$1,000	\$14,000
95 - 100%	\$1,250	\$1,000	\$16,000

* Honorarium granted for academic appointment conducted under faculty supervision: 100 hours per term.

For additional information on these and other scholarships, awards and bursaries, visit www.uwindsor.ca/awards.

Encouraging Women in Engineering

The University offers the University of Windsor Women in Engineering Scholarship, valued at \$1,000, for female students who are entering the faculty directly from high school. The goal is to encourage equitable representation of women in the field of engineering.

Dr. Kemal Tepe

Dr. Shaohong Cheng

ENGAGING

Dr. Guoqing Zhang

Dr. Vesselin Stoilov

Teaching and Research Excellence

The Faculty of Engineering is home to professors who are both exceptional teachers and researchers. You will benefit from their knowledge, support and genuine interest in your academic goals.

Dr. Kemal Tepe

Professor: wireless communication and protocols, computer networks, ad-hoc (sensor) networks.

“I have been educated in four different countries, in as many different languages. Never have I met a professor who takes such a personal interest in his students. Not only is Dr. Kemal Tepe approachable, he is more than happy to help out students. The concepts of computer and wireless communication that he taught in class were a lifesaver for my capstone project. Now, if he isn't a great professor, I really don't know who is.”

Bharat Bhardwaj, BASc '07 Electrical Engineering

Dr. Shaohong Cheng

Professor: dynamics of structures, aerodynamic response and wind-resistant design of bridges, buildings, fundamentals in bluff body aerodynamics, vibration and control, numerical simulation, roof snow accumulation and drifting.

“I feel that Dr. Cheng's teaching style has helped me a great deal to understand the concepts better. The examples during the class lectures were very clear and were useful to look at for reference when studying. When first-year students ask me to recommend which professor to take this course with, I will most definitely have great things to mention about having Dr. Cheng as a professor.”

Fadi Madi, BASc '11

Dr. Guoqing Zhang

Professor: optimization, decision support systems, supply chain management, modelling of manufacturing, operational research and management.

“You have always been a source of inspiration. I heartily thank you for extending your support and co-operation throughout the courses of engineering studies.”

Jasmina Samcevic BASc '05

Dr. Vesselin Stoilov

Professor: modelling and characterization of active materials, multi-scale modelling, design and characterization of N/MEMS, micro/nanoscale mechanics and tribology, computation materials.

“Dr. Stoilov was a great first-year professor to have, both as an instructor and a mentor. For example, before our final exam, he was kind enough to meet with me to answer some questions I had. He was extremely helpful and approachable then and throughout the semester. He had a profound effect on my learning and choice of major.”

Daniel Baggio, BASc '10 Civil Engineering with minor in Math

DID YOU KNOW?

Engineering co-op students benefit from participating in such projects as groundwater supply studies, robotics programming, noise surveys, production line design, and computerized information systems.

Experiential Learning

Co-operative education gives you a well-rounded education founded both in academic theory and real-world application.

By combining your studies with full-time, paid employment in career-related positions, you will be able to apply what you learned in the classroom, gain related, hands-on experience, network with employers, explore career options and learn how to compete confidently in the job market. Our programs offer a diverse range of opportunities while providing individual attention. Placements extend beyond Windsor and Essex County across Canada, and many other countries around the globe. We continually have students working as far away as Switzerland and Germany.

Co-op placements

We offer placements with a wide range of corporate partners and government agencies, including:

- ABB Corporate Research
- Canadian Tire Corporation
- Chrysler Group LLC
- EnWin Utilities
- General Motors of Canada
- Henry Ford Health System
- Honda of Canada Manufacturing
- Hydro One Networks Inc.
- INCAT Solutions
- Kautex Textron
- Ministry of Transportation
- Montrose Engineering
- Nematik Canada
- Ontario Power Generation
- Roush Industries
- Schaeffler Group
- Talisman Energy
- Windsor Mold Inc.

Co-op Internships

In special cases, you may take an eight-, 12- or 16-month co-op placement (internship). Co-op internships are normally taken by, but are not limited to, senior students, and are arranged in conjunction with the Centre for Career Education and the applicable engineering department.

Salary Information

Typical salary range for engineering internships is \$14/hr to \$18/hr, depending on the year level of the student and the engineering specialty.

For more information, please contact the Engineering Co-op Coordinator at:
coop@uwindsor.ca
519-253-3000, ext. 3558
www.uwindsor.ca/cce

Focus on Students

The Faculty of Engineering is known for the personal interest that we take in our students. We want to ensure that your first-year experience is exceptional and we have the tools in place to give you the best chance for success in your studies.

WINONE* office for first-year Engineering students

Becoming an engineer requires dedication and commitment. The Faculty of Engineering WINONE Office is here to help. WINONE provides additional counselling, explains the educational requirements of your degree and gives you extra support to help you succeed.

For example, our Undergraduate Student Advisors Program connects you with a select group of senior and intermediate engineering students who can:

- Assist you in understanding key concepts
- Advise you on how to handle tests and projects
- Suggest student clubs and activities

Take advantage of the WINONE Office and make the most of your time at UWindsor.

Student life

You will have many opportunities to get involved both on campus and in the community. You can network with others, meet new people and share in the school spirit! Some of the groups and teams you can join include:

- Engineering Society
- Engineers Without Borders

- Institute of Electrical and Electronics Engineers
- SAE Baja, Formula One and Super Mileage teams

You will automatically be a member of the Engineering Students' Society (EngSoc), a student-run organization that provides many services and initiatives, from social and charitable events to exam banks, nation-wide competitions, and conferences. EngSoc has been active for nearly half a century. For more information about EngSoc or a variety of other clubs and societies on campus visit www.uwindsor.ca/engsoc or www.uwsa.ca

Engineers Without Borders

Engineers Without Borders Canada (EWB) is a non-profit, non-governmental organization of engineering students and professionals across Canada. The Windsor chapter of EWB has sent its university student volunteers to Ghana, Malawi, Zambia and Burkina Faso to create positive change through engineering projects.

In Africa, these volunteers work in areas such as market access, agriculture, access to water, and rural infrastructure.

* WINONE is a contraction of Windsor and One, and is a term we use for first year engineering

A Foundation for Learning

I In fall 2012, you will be welcomed into one of the most advanced engineering facilities in Canada, the Centre for Engineering Innovation (CEI).

The 300,000 square foot, \$112-million CEI will feature innovative teaching spaces and research laboratories. This will allow you to explore engineering in all the amazing disciplines we offer, as well as emerging and exciting fields such as environmental sustainability, alternative energy, nanostructures, lightweight materials, and more efficient manufacturing systems.

The CEI is constructed of recycled materials where possible, and incorporates a green roof, water recycling, low-energy heating and other sustainability systems. In this “living” building, you will view and assess, in real time, the building’s electrical, mechanical, civil and environmental engineering systems at work.

The CEI will be a place that connects students, educators, researchers, industry and business.

For more information, including a virtual tour and updates on the construction progress, please visit www.uwindsor.ca/cei



PROGRESS



Visit us

Campus Tours

1 p.m. Weekdays
Except holidays
(limited tours during December and April)

1 p.m. Saturdays
During October, November, March and May

Book on-line www.uwindsor.ca/tour
Toll-Free: (Canada/US): 1-800-864-2860
Please call one week in advance.

Contact Information

Office of Liaison & Student Recruitment
University of Windsor, Windsor, Ontario N9B 3P4
519-973-7014
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liaison@uwindsor.ca

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www.uwindsor.ca/BEngtech

WINONE Office for First-Year Engineering
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AUTO21
www.auto21.ca

For the most up-to-date program offerings,
visit www.uwindsor.ca/calendar

Have a question? Ask a Liaison Officer:
www.uwindsor.ca/questions

