Bachelor of Engineering

Design. Create. Solve.

UNIVERSITY of GUELPH

IMPROVE LIFE.

Bachelor of Engineering

Improve sustainability through innovation

Since 1874, engineering at the University of Guelph has focused on improving human, animal, and plant life through innovative engineering techniques. All of our engineering programs are developed with design engineering as a foundation; design is fundamental to all U of G Engineering disciplines.

As a student, your hands-on design projects will have you transform the theoretical into reality. Those hands-on design projects begin in your first year. Every year, you'll work alongside students from other engineering disciplines on a different design project, leading to your final capstone design course in your final year.

As an engineering student at U of G, you have seven majors to choose from, each offered in co-op. You have the opportunity to take elective courses outside of engineering, such as arts, social sciences and business. Pursue a minor after 2nd year, and expand your knowledge outside of engineering!

uoguelph.ca/engineering

Biological Engineering

Also available in co-op

uoguelph.ca/engineering/biological

As a Biological Engineer, you will work with the most complex "machines" in the world - living organisms. You will tailor your program to explore interests in the investigation of bacterial biofilms for food safety or human health applications, development of biosensors for animal health, greener alternatives to petroleum products with production of renewable fuels such as ethanol and biodiesel or sustainable bioplastics made from plant materials. The extraction and stabilization of nutraceuticals to provide health benefits, or the manufacturing of safe food products.

Pursue interests in:
- Process engineering
- Materials science
- Food engineering
- Bionanotechnology

Sample Careers: Brew master | Process engineer | Research and development engineer | Food product development engineer

Biomedical Engineering

Also available in co-op

uoguelph.ca/engineering/biomedical

Biomedical Engineering is an exciting new engineering field which fuses engineering design and problem solving to improve human health. As a leader in the life sciences, Guelph is the perfect place to begin your Biomedical Engineering career. Biomedical Engineering can also be an entry point into medical school.

Specialties:
- Bioinstrumentation
- Cellular, tissue and genetic engineering
- Biomaterials
- Pharmaceuticals

Elective Areas of Interest:
- Biomechanics
- Pharmaceutical processing
- Biosignals

Sample Careers: Prosthetic designer | Physician | Medical imaging | Human factors engineer

Our B.Eng. grads have worked here:

- Google
- Tesla
- PepsiCo
- Bombardier
- Adidas
- Mondelez International
- Stryker
- OMAFRA
- Linamar
- Stantec
- Baylis Medical
- RWDI

...and many other satisfied employers!

Computer Engineering

Also available in co-op

uoguelph.ca/engineering/computer

Processors small enough to be embedded in concussion detectors. Autonomous mine detecting robots. Open source operating systems. Big Data and Artificial Intelligence systems. If any (or all!) of these sound like something you want to design, then join us in Computer Engineering. In this program, you will learn how to integrate hardware and software to design these devices and more.

Pursue interests in:
- Artificial intelligence and robotics
- Software engineering
- Microsystems design and integration
- Wireless communications

Elective Areas of Interest:
- ▶ Electronic design automation
- ▶ Microsystems
- ▶ Robotics and artificial intelligence
- ▶ Software

Sample Careers: Computer design engineer | Software engineer | Hardware engineer | Artificial intelligence developer | Wireless solutions engineer

Engineering Systems and Computing

Also available in co-op

uoguelph.ca/engineering/esc

What do prosthetic limbs, autonomous robots, and smart buildings have in common? These complex systems are all designed by multidisciplinary teams and run by microcontrollers and embedded processors. If you want to bridge the gap between disciplines while learning to design the computational brains that control these complex systems, then this program is for you. Engineering Systems and Computing is a highly flexible, interdisciplinary program that prepares you to work in today's world-changing high-tech industries.

Specialties:
- Digital systems design
- Operation systems
- Signal processing
- Micro computer interfacing

Elective Areas of Interest:
- ▶ Mechatronics
- ▶ Biomedical
- ▶ Embedded systems
- ▶ Computing

Sample Careers: Software developer | Autonomous test engineer | Robotics and automation engineer | Systems engineer | Mechatronics engineer

Environmental Engineering

Also available in co-op

uoguelph.ca/engineering/environmental

You can be the change! Learn the tools to tackle environmental challenges locally and globally. Environmental Engineering students learn about how air, water and soil pollution is generated, transported and impacts the environment. Learn how to design treatment processes to prevent pollution, control and prevent dangerous emissions, and clean up past contamination. A degree in Environmental Engineering will equip you with skills and knowledge to tackle the environmental challenges of today and design a more sustainable tomorrow.

Specialties:
- Air pollution control
- Soil mechanics
- Watershed system design
- Water and wastewater treatment design

Sample Careers: Air quality engineer | Environmental lawyer | Environmental affairs manager

Water Resources Engineering

Also available in co-op

uoguelph.ca/engineering/water

Water is life! Water Resources Engineers are needed who can design solutions to balance competing human needs for water with those of the environment. Global climate change has created new challenges for Water Resources Engineers in all areas of society and the environment. There are local and global opportunities for you since water is going to be one of the most important worldwide issues for your generation, and generations that follow.

Pursue interests in:
- Water conservation
- River restoration
- Storm water management
- Meteorology and geology

Sample Careers: Emergency spill response engineer | Municipal coordinator | Watershed manager | River control engineer | Water resources designer

Mechanical Engineering

Also available in co-op

uoguelph.ca/engineering/mechanical

Designed around a framework of sustainability, Mechanical Engineering empowers you to design systems and develop technology that improves the quality of life. With unique options to challenge and inspire you, Mechanical Engineering provides you with the skills required to design, manufacture and maintain all types of mechanical systems. From designing wind turbines, developing robotics and automated systems, to improving prosthetic limbs, you will be entering into one of the most popular and employable fields in the industry.

Pursue interests in:
- Renewable and sustainable energy
- Mechatronics
- Biomechanics and prosthetics
- Manufacturing

Elective Areas of Interest:
- ▶ Manufacturing
- ▶ Sustainable energy
- ▶ Mechatronics
- ▶ Biomedical

Sample Careers: Aerospace project coordinator | Manufacturing engineer | Robotics and automation engineer | Mechanical design engineer

Undeclared

Admission in first year only

uoguelph.ca/engineering/undeclared

This option is designed for students who know they want to study engineering, but are not yet sure what major they want. Selecting undeclared, you'll take the same courses in first semester as all other engineering students in your cohort. Yes, you can get your choice to major in any of the 7 regular majors (non co-op option) as an Undeclared, you are guaranteed your regular stream spot. You will need to select your major no later than the start of your 3rd semester. If you want to pursue co-op, you should apply to the program you are most interested in (in co-op) directly from high school because space in co-op is limited.

Sample First Year Courses

Semester 1:
- General Chemistry I (CHEM*1040)
- Engineering and Design I (ENGG*1100)
- Calculus I (MATH*1200)
- Physics with Applications (PHYS*1130)
- Depending on program, one of:
  - Engineering Analysis (ENGG*1500)
  - Programming (CIS*1300)
  - Introduction to Programming (CIS*1500)

Semester 2:
- Engineering Mechanics I (ENGG*1210)
- Calculus II (MATH*1210)
- Introductory Electricity & Magnetism (PHYS*1010)
- 2 others** as described in the program guide: uoguelph.ca/engineering/beng-program-guides

***courses will vary depending on your major*

Choose Guelph.

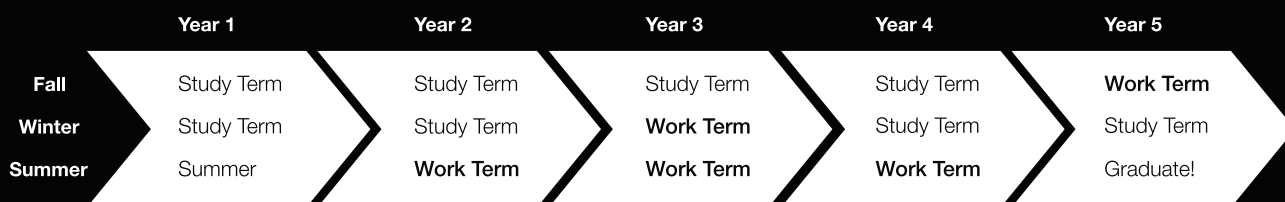### The U of G Engineering Difference
- U of G Engineering was Canada's first recipient of the Women-Friendly Engineering School Award.
- Collaboration is pivotal at Guelph Engineering. By working in a team with engineers from other disciplines, you gain unique perspectives. Explore collaborative opportunities with programs such as agriculture, arts, business, and veterinary sciences. Solve real world problems by partnering with industry.

As a student...
- You will have a flexible and common first semester to enable your interaction with all engineering disciplines.
- Choose from over 40 minors to complement your degree. Popular choices for Engineering minors are business, arts, or international development.
- With five courses in your first semester, you will have opportunity to participate in extracurricular activities.
- U of G has one of the largest intramural programs in Canada!
- From football to figure skating, Varsity Gryphon Engineers compete on and off the field.
- Join the more than 200 clubs on campus. Be part of engineering-specific clubs such as: Guelph Innovations Society; The Engineering Society; Women in Engineering and Science; Engineers Without Borders; Formula SAE Racing Team; Concrete Toboggan; Guelph Hyperloop, the Robotics Team, and more.

How co-op works

- All seven engineering majors are offered in Co-op.
- Co-op work terms begin in the summer of your second year and give you paid work experience; you'll have the opportunity to complete one 4-month work term and two 8-month work terms! The 8-month work terms are a hit among employers - there's so much more opportunity for breadth of learning and contribution to the company.
- Co-op work terms aren't restricted to local companies! Work internationally in Australia or Europe, for example.

	Year 1	Year 2	Year 3	Year 4	Year 5
Fall	Study Term	Study Term	Study Term	Study Term	**Work Term**
Winter	Study Term	Study Term	**Work Term**	Study Term	Study Term
Summer	Summer	**Work Term**	**Work Term**	**Work Term**	Graduate!

Admission Requirements*

- English (ENG4U)
- Advanced Functions (MHF4U)
- Calculus and Vectors (MCV4U)
- 2 courses from:
  - ▶ Biology (SBI4U)
  - ▶ Chemistry (SCH4U)
  - ▶ Physics (SPH4U)
- 1 additional course

All must be at the 4U/M level.

IMPORTANT ADMISSION NOTE:

Effective Fall 2022, admission requirements* to Bachelor of Engineering change to:

- English (ENG4U)
- Advanced Functions (MHF4U)
- Calculus and Vectors (MCV4U)
- Chemistry (SCH4U)
- Physics (SPH4U)
- One additional 4U/M course

Attend our fall event!

🍁 **Fall Preview Day**
Sunday, November 8, 2020
To register and for more information, visit admission.uoguelph.ca/events

Have Questions?

Contact our Recruitment Officer:

✉ enginfo@uoguelph.ca

📱 519.400.9913

🌐 uoguelph.ca/engineering/welcome