

# DISCOVER ENGINEERING

VIEWBOOK 2022-2023



UNIVERSITY OF  
TORONTO

Engineering



Pictured below is the Stewart Blusson Visualization Laboratory, a leading-edge facility within the Myhal Centre for Engineering Innovation & Entrepreneurship. Featuring an 11 metre-wide immersive video wall with ultra-high-resolution technology, it enables students to experience larger-than-life images, videos, models and simulations.



#### **TRADITIONAL LAND ACKNOWLEDGEMENT**

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.



# #1

We are Canada's top-ranked engineering school. UofT Engineering placed 14 spots higher than the next Canadian school in the 2021 QS World University Rankings for Engineering and Technology.

# 75+

Engineering student clubs and teams to explore

# 35%

International students in first-year engineering studies

# 21

Engineering minors and certificates to customize your degree

# 360+

Companies employ

# 700+

engineering co-op students each year

# #1

UofT is 1st in Canada and 16th in the world for producing the most employable graduates (QS Graduate Employability Rankings 2020)

# \$15.7B

Injected into the Canadian economy per year as a result of UofT's research

# 160+

Partner universities worldwide for study or research opportunities

# 40%

For the past five years, UofT Engineering's first-year class has been near or above 40% women, the highest proportion in Canada

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# ENGINEERING FOR THE WORLD



Learn more:  
[uofteng.ca/e4tw](https://uofteng.ca/e4tw)

The world is always changing — challenging how we live and interact with our environment and each other. Where most see uncertainty, engineers see immense opportunity to shape the future.

Whether you aspire to improve access to clean water, leverage AI to support health care, or create more sustainable ways to move people through urban environments, your success depends on being able to think and act with a global perspective.

U of T Engineering provides an education that augments technical and design skills with a deep understanding of the social, economic, ethical and cultural contexts that impact engineering solutions. Through practical experience, you'll

learn to collaborate with diverse team members, and develop the resilience to be at home anywhere in the world.

Our community of innovators represents more than 100 countries and a rich spectrum of backgrounds and experiences. Your courses are led by world-renowned professors who will challenge you to explore how technology, innovation, economics, social license and development intersect. Throughout your academic journey, you will apply your skills and knowledge in the real world by working with industry, NGOs and academic partners — both locally and abroad.

We are immensely proud of all the ways our students and alumni inspire change in their communities and around the world. We look forward to helping you harness your potential as an engineer for the world.





### 1 BRAZIL (AND WORLDWIDE!)

Civil engineering student **Jeff Mukuka** is one of many participating in the International Virtual Engineering Student Teams initiative. It connects U of T Engineering students with peers at more than 15 universities globally, from University of São João del-Rei to the National University of Singapore. Together, they tackle design challenges.



### 2 CANADA

In 2019, industrial engineering student **Natalie Enriquez-Birch** was among 22 young leaders selected to attend the Arctic Youth Ambassador Caucus in Iqaluit. In 2020, Natalie served as co-president of U of T's Engineers Without Borders chapter, and this year she holds the role of Equity & Inclusivity Director within the Engineering Society.



### 3 CANADA/USA

In summer 2020, **Lauren Streitmatter** worked remotely from her home in Toronto on a pandemic modelling research project at Carnegie Mellon University through the Engineering Science Research Opportunities Program (ESROP). Lauren is one of many students who continued their summer research virtually this past year.



### 4 COSTA RICA

Electrical and computer engineering student **Diego Amores** and his team members designed a solar panel installation for an isolated community in Costa Rica as part of their fourth-year capstone course. Diego is also pursuing a certificate in Global Engineering, which is part of U of T's Global Scholars program — learn more on page 19.



### 5 MONGOLIA

Mechanical engineering student **Ben Sprenger** was part of a research team that travelled to Mongolia in 2019 to study the impact of an initiative that provides portable solar panels to nomadic herders. The trip was organized through U of T's Reach Project with support from the Mastercard Center for Inclusive Growth.



### 6 SOMALIA

A team led by Engineering Science student **Shrey Jain** developed an online platform that provides a real-time heatmap of potential and confirmed COVID-19 cases among vulnerable populations in Toronto, Montreal and in Mogadishu. Flatten.ca enabled governments to quickly identify areas that required the most attention.



### 7 SWITZERLAND

A new graduate of the materials engineering program, **Yilin Huang** pursued her passion for robotics through her co-op position at Flyability, a Swiss drone company. She led a project to test the robustness of propellers for the company's drones, which are used to inspect large or complicated structures in diverse industries. Learn more about our co-op program on page 8.



### 8 USA

During her internship at MIT's Media Lab, recent grad **Inioluwa Deborah Raji** examined racial and gender bias in facial-recognition technologies and presented her findings at an AI ethics conference. She also worked at alumni-founded AI startup Clarifai and initiated Project Include, which teaches coding to kids in low-income communities. In 2020, Inioluwa was named one of *MIT Technology Review's* Innovators Under 35.





The prototyping facilities within the Myhal Centre for Engineering Innovation & Entrepreneurship are a hotspot for bringing all kinds of projects and ideas to life. The Myhal Centre is also home to collaborative workspaces and The Entrepreneurship Hatchery, one of several accelerators across U of T.

## INNOVATION STARTS WITH AN IDEA

 Learn more:  
[uofteng.ca/innovation](https://uofteng.ca/innovation)

For an idea to grow into something more, it needs a collaborative network of diverse peers, experienced mentors and an environment that invests in, and nurtures, entrepreneurial thinking.

U of T Engineering fosters the perfect ecosystem to see your ideas come to life, whether you're thinking about new ways to approach research, start a business or create a student team.

Innovation and entrepreneurship extend beyond the borders of our campus. We take full advantage of our prime location in the heart of Toronto, collaborating with our neighbours in the MaRS Discovery District, world-class hospitals, firms in Canada's financial district, and major multinational organizations headquartered here.



### aToronto

The U of T Engineering aToronto team has placed first in the Autodrive Challenge for the past four straight years with their most recent win in June 2021. The annual North American intercollegiate competition challenges student teams to build a fully autonomous passenger vehicle that can navigate an urban driving course successfully. The aToronto team includes more than 60 members, and consists of faculty supervisors working alongside current graduate and undergraduate U of T Engineering students.



### Curious about innovation at U of T Engineering?

Tune in to our new podcast "Tell me more: Coffee with Chris Yip" as our Dean sits down with a member of our dynamic global community to talk about what they're working on.

[uofteng.ca/TellMeMore](https://uofteng.ca/TellMeMore)



# LIFE IN TORONTO



Learn more:  
[uofteng.ca/toronto](http://uofteng.ca/toronto)

With more than 140 cultures represented throughout its neighbourhoods, Toronto is a welcoming place where the world comes together. As North America's fourth-largest city — growing faster than LA and New York City — and its safest, Toronto is a cosmopolitan hub for arts, culture, sports, technology and business.



With companies like Netflix, Twitter and NVIDIA expanding their operations in Toronto, it's no wonder the city ranks among the top five in the world for tech talent and opportunity. This makes Toronto an excellent place to find work opportunities and build your future career.



Union Station is Canada's largest transportation hub with connections to trains, subways, streetcars and buses. The station also connects to the largest underground pathway in the world and both airports that serve Toronto: Pearson International (YYZ) and Billy Bishop (YTZ).



The city buzzed with excitement when the Raptors won the 2019 NBA Championship. The Raps are one of Toronto's eight professional sports teams.



Toronto hosts the world at several annual festivals and celebrations, including the Toronto International Film Festival, Pride Toronto and Caribbean Carnival.



Little Italy, Greektown and Chinatown are a few of the many cultural hubs close to campus. With more than 7,500 restaurants across Toronto, you can eat your way around the world.



Hospital Row is a stretch of world-class hospitals and research centres located next to U of T — many of which partner with our researchers and employ our students for co-op and summer work.



# VIBRANT STUDENT LIFE

Learn more:  
[uofteng.ca/studentlife](http://uofteng.ca/studentlife)

From the earliest days of our Faculty's history, students have referred to U of T Engineering and its community spirit as Skule™ (pronounced "school").

Community pride, passion and camaraderie runs strong among engineering students. Despite the challenges posed by the global pandemic, Skule's vibrant student life has continued to flourish virtually.

Whatever your interests or hobbies — from playing in a music ensemble to designing a canoe made from concrete — there is a student group or co-curricular activity for you. You'll have access to more than 75 teams in U of T Engineering and another 800 across U of T. And if you can't find a club that suits your interests, you'll have the support to start your own.

Participation in co-curricular activities at The Entrepreneurship Hatchery and Troost Institute for Leadership Education in Engineering will further complement your engineering education, improving your communication, teamwork and professional skills.

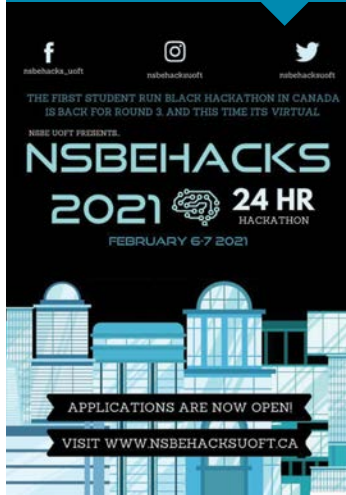


@erin22xoxo

With everything being shifted to being online due to the Coronavirus I thought for this week's #TuesdayThoughts, I'd share some tips to help you push through your finals and finish your semester!

@nsbeuoft

NSBEHacks, the first university student-run black hackathon in Canada is back for a 3rd run, and this time its virtual! 🧑‍💻



@humans.of.skule

"I thought covid would really put an end to socializing and Skule life and everything but I ended up getting more involved and making new friends during quarantine and it's been a really cool experience" -Mia Mohamed

@skuledance

Happy International Dance Day! Here at Skule Dance Club, dance is something that brings happiness and community together. That's worth celebrating 🥳



@uoftengineering

🎉 On the 12th Day of #Skule, engineering gave to meeee...🎉 Celebrate the holiday season, 🎁 warm up those vocal cords (shout-out to @connor.glossop) 🎤 and take a look back at all of the amazing things our #UofTEngineering community accomplished this year. 🥰 Wishing you and your loved ones a happy holiday! 🎄



@uoftengineering

From yellow hard hats to purple face paint, the #UofTEngineering Frosh Week team is keeping traditions alive during an unprecedented #BackToSkule 🥰







**TONIGHT  
@ 8PM EDT**  
LINK IN BIO

📷 @skulenite

TONIGHT IS THE NIGHT! Tune in to skulenite2t1.skule.ca at 8PM EDT tonight for an evening of endless laughter 🍷🎉

📷 @uoftengdean

Had a fun afternoon #CoffeeWithChris with @christineyar today @uoftmie @uoftengineering - catching up on her new @uoftecc opportunities in Germany. Cool to hear her plans and how her internships @siemens and @teslamotors came about.



🐦 @hploeg

So so proud of my niece @Cacia\_Ploeg who graduated from @UofT @uoftengineering today!! Congratulations!! #IWED2021 #ThisIsWhatAnEngineerLooksLike



📷 @uoftengineering

Engineering student Erin Richardson is currently working at her dream job: the aspiring astronaut is helping to develop new-gen autonomous space robots for @mda\_space.

## RESIDENCE

*"Living in Chestnut Residence is a lot of fun. In addition to having meals with friends in the buffet-style dining hall and playing pool in The Urban, it's great getting to know my neighbour Professor Variawa. He is part of the faculty-in-residence program."*

— Ernie Lee, Year 3 Civil Engineering



Living in residence is an excellent way to immerse yourself in university life. Residence is guaranteed for all new full-time students entering their first year of undergraduate study for the first time.

**See page 20 for details on how to apply for residence.**

📷 @uoftengsoc

Skule's Got Talent has officially been revived!

New Skule's Got Talent video is now out!!! 🥳🥳🥳



Check out our final Skule's Got Talent performance!!! 🥳



📷 @humans.of.skule

"I genuinely believe that active politics that engage directly with the community can make people's lives better, and that as a community, when we engage with one another we can make something better than we ever could alone"  
— Chris Kousiniaris

# A CO-OP DESIGNED FOR FUTURE ENGINEERING PROFESSIONALS



Learn more:  
[uofteng.ca/coop](http://uofteng.ca/coop)

U of T Engineering students can graduate with up to 20 months of meaningful work experience while earning a competitive salary, creating an extensive network and gaining professional skills they'll leverage for years to come.

That's what we deliver through the **Professional Experience Year Co-op**, our flagship work-experience program with a proven track record going back more than 40 years. Created in collaboration with industry partners and engineering leadership experts, this program is designed to help you build your professional profile and prepare you for long-term career success.

## JOINING CO-OP IS EASY!

Co-op is completely optional — indicate your interest during the U of T Engineering application process (see page 20 for details).

## CO-OP AT U of T ENGINEERING IS BUILT ON THREE PILLARS

1

### LAY YOUR FOUNDATION

You'll complete foundational programming designed to orient you to different industries, guide you through the professional goal-setting process, and practice the skills you'll need to be successful in securing employment during the recruitment cycle, like making a positive impression and writing industry-ready resumes and cover letters. Foundational programming begins in your first year at U of T Engineering and continues into second year.



2

### APPLY YOUR KNOWLEDGE

Drawing on the career confidence you've developed, you'll apply to and interview for co-op positions that align with your goals. Through our robust network of employers, you'll have access to 1,900+ jobs around the world and across every sector. There are two main recruitment cycles: during second year in preparation for an optional four-month summer co-op, and during third year in preparation for a 12-to-16-month position.



3

### SHOWCASE YOUR TALENT

While on the job, you'll immerse yourself as a full-time employee. Working for 12 to 16 consecutive months after third year will give you ample opportunity to make meaningful professional contributions and build a valuable network. You'll also have the option to work for an additional four months in the summer following second year, giving you up to 20 months of paid professional work experience before you graduate.





**Kimberly Lai** completed her 16-month co-op work term at Safran Landing Systems, a global company that designs and manufactures aircraft landing gears. As a Systems Architecture Intern, Kimberly helped to develop a model-based-systems engineering platform for the development of landing gear systems. While her office was located in Ajax, Ontario, she collaborated with engineers all over the world, and had the opportunity to travel to France to work with industry experts.



“Since my co-op position was over a year long, I was able to take on more responsibility such as designing the architectural framework for all system models and contributing to current bids. I truly felt like a part of the team and that my inputs and opinions were valued. My experience really helped me grow professionally and as an individual. It allowed me to gain deep insight into what working in the aerospace industry is like.”

— Kimberly Lai, recent Engineering Science graduate

## BY THE NUMBERS



Leverage UofT Engineering's connections to **360+ companies** worldwide, including Honda, IBM, Sanofi Pasteur, Shell and more.



You'll have access to **1,900+ positions** across a broad range of industries worldwide; 1 in 10 students work outside of Canada.



**All co-op positions are paid.** Last year, students earned an average 12-month salary of **\$53,000 CAD** with higher earnings for longer durations of work.



Graduate with **up to 20 months** of professional experience from different companies across two work terms after second and third year.



Your co-op experience can count toward obtaining your **P.Eng. designation**, giving you a head start on earning your professional engineering license after graduation.

# YOUR SUCCESS IS OUR SUCCESS



Learn more:  
[uofteng.ca/success](http://uofteng.ca/success)

Our tight-knit community thrives because success is a shared goal. You'll find support among your fellow classmates, in your professors and teaching assistants, and in the staff members who facilitate a range of specialized services that address the needs of engineering students. In addition to the engineering-specific services listed below, every student has access to robust U of T-wide services including the Health & Wellness Centre, Academic Success Centre, Accessibility Services and the Centre for International Experience.

## MENTAL HEALTH & ACADEMIC SUPPORT FOR ENGINEERING STUDENTS

The **First Year Office** team supports your transition to life as a U of T Engineering student. This includes a dedicated **Inclusion and Transition Advisor** who provides personalized guidance as you find your community. After first year and for the remainder of your degree, your **departmental advisor** will support you through your academic journey.

The **Registrar's Office** facilitates all administrative aspects of your education, including financial aid and course scheduling. Through this office, you'll have access to a **learning strategist**, an **advisor for international students**, a **wellness counsellor** and an **accessibility advisor**.

The **Mental Health Programs Officer** supports students in navigating mental health resources and leads initiatives within U of T Engineering to support student well-being. This role works closely with the **Skule™ Mental Wellness Director**, who creates student programming and opportunities centred around enhancing mental health and wellness within the community.

A **Student Life Programs Coordinator** supports engineering students living at Chestnut Residence. Chestnut also has a faculty member who lives on site.

U of T Engineering's **Office of Diversity, Inclusion and Professionalism** joins several other groups and positions within the Faculty that are dedicated to creating an environment and culture free of harassment, discrimination and intolerance.

To succeed in your studies and beyond, you'll need a strong foundation in leadership, communication and math. We created the **Troost Institute for Leadership Education in Engineering**, **Engineering Communication Program** and the **Math Aid Office** to support your development in these areas.

The **Engineering Career Centre** facilitates the co-op experience at U of T Engineering and offers a range of programming to help prepare you for your future career.

When you begin your first year at U of T Engineering, you'll receive an invitation to join **U of T Engineering CONNECT**, an online network of alumni worldwide. They can offer you mentorship, industry-specific career advice, job leads and more.

# 94%

of first-year engineering students move into second year. For those who choose a different path, academic advisors help them to navigate program transfers.



Your professors are more than teachers and renowned researchers. They are mentors, collaborators and advocates for your success.

### MEET PROFESSOR JASON BAZYLAK

Professor Bazylak teaches Engineering Strategies & Practice, a first-year design course in the Core 8 programs. He guides teams of students as they work with real clients on design challenges. His passion for the community extends far beyond the walls of the classroom. He is an active member of the Engineering Positive Space committee and serves as the Dean's Advisor on Indigenous Initiatives. For his creativity and dedication to enriching the student experience, he was recently named a Hart Teaching Innovation Professor.





Students sit atop a float constructed by the U of T Engineering Blue and Gold Committee at the 2019 Toronto Pride parade.

## OUR DIVERSE COMMUNITY



Learn more:  
[uofteng.ca/diversity](http://uofteng.ca/diversity)

Diversity deepens the engineering creative process and enriches the student experience. We are committed to creating an equitable and inclusive community, and to increasing access to engineering studies for communities that have historically been underrepresented within the profession.



In February 2020, the U of T chapter of the National Society of Black Engineers hosted NSBEHacks 2020, the only student-run Black hackathon in the Greater Toronto Area. NSBEHacks2021 ran virtually.

## ADDITIONAL WAYS U of T SUPPORTS AND PROMOTES EQUITY AND INCLUSION:

**Student-run associations** such as the National Society of Black Engineers, Women in Science and Engineering, Queer Sphere, Muslim Students' Association and the Indigenous Students Association host a range of special events and outreach activities year-round. The Engineering Society also has a dedicated Equity & Inclusivity Director.

All U of T students can access **on-campus medical and mental health support and services** through doctors, counsellors and psychologists. Students also have access to 24-7 counselling support offered in numerous languages.

Students with disabilities can connect with **Accessibility Services** to discuss adaptive technology, accommodations and success strategies.

Indigenous students can tap into a network of centres and resources across campus, such as **First Nations House**.

The **Sexual & Gender Diversity Office** provides programming, resources and advocacy on sexual and gender diversity. The St. George campus also has several gender-neutral bathroom facilities.

The **Multi-Faith Centre** supports spiritual well-being and encourages interfaith dialogue. There are dedicated spaces for prayer and meditation across U of T.

The **Anti-Racism and Cultural Diversity Office** provides a safe space for students, faculty and staff to strengthen the diversity of the University community.

# CUSTOMIZE YOUR EDUCATION



Learn more:  
[uofteng.ca/customize](http://uofteng.ca/customize)

Through discipline-specific specializations, multidisciplinary minors and certificates, and unique professional opportunities, you can customize your U of T Engineering degree to meet your own developing interests at every stage of your academic journey. Academic flexibility combined with a wide range of optional

curricular and co-curricular opportunities means that you graduate equipped with the engineering competencies, professional confidence and global perspective to address complex challenges.



**START  
HERE**

## APPLY

During the application process, you'll decide how you want to begin your journey at U of T Engineering. There are two pathways you can choose from:

### THE TWO PATHWAYS

#### CORE PROGRAMS

##### CORE 8, DECLARED ENGINEERING

If you know what you want to study during your degree, you can apply directly to a Core 8 program: Chemical; Civil; Computer; Electrical; Industrial; Materials; Mechanical; or Mineral. (See pages 15 to 18 for details)

##### TRACKONE, UNDECLARED ENGINEERING

If you're unsure of how you'd like to focus your first year, the TrackOne program allows you to explore several areas across engineering. At the end of first year, you will declare which of the Core 8 programs you will join in second year for the remaining three years of your undergraduate degree. (See page 14 for details)

#### ENGINEERING SCIENCE

Engineering Science (EngSci) is a direct-entry program designed for those seeking a unique academic challenge. The first two years of the program — called the Foundation Years — are common to all EngSci students. In the latter half of your program, you will specialize in one of eight exciting majors. (See page 18 for details)

### FIRST YEAR

First year is about establishing fundamental knowledge in math, applied and basic sciences, and design. For this reason, the first-year curricula for the Core 8 programs and TrackOne are very similar. Topics covered in the first year of all Core Programs include:

- » Math (linear algebra, calculus)
- » Physics
- » Chemistry (physical chemistry and/or materials science)
- » Programming (Python or C)
- » Engineering Design, Communication and Practice

The Foundation Years establish breadth and depth in engineering principles and design. Topics include but

#### FOUNDATION YEAR 1

- » Calculus, Algebra
- » Mathematical Computation
- » Computer Programming (Python and C), Algorithms
- » Electric Circuits
- » Physics, Material Science
- » Engineering Design, Communication and Practice

## OPTIONAL CURRICULAR AND CO-CURRICULAR OPPORTUNITIES

Here are just a few of the many ways you can add to your academic journey through optional curricular and co-curricular opportunities:



Focus your career trajectory while earning a competitive salary through the immersive **PROFESSIONAL EXPERIENCE YEAR CO-OP PROGRAM** (page 8)



Advance the frontiers of engineering through a **SUMMER RESEARCH POSITION** either on campus or at a partner university internationally



## SECOND YEAR

Expand your knowledge with more courses in your discipline. Gain a greater depth of understanding through enhanced lab experiences and design opportunities.

## THIRD YEAR

Deepen your knowledge further by choosing an area of focus within your Core 8 program (see pages 15 to 18 for discipline-specific areas). Consider taking electives that allow you to complete a multidisciplinary minor or certificate (see page 19).

If you opted into the PEY Co-op Program, this year is particularly important in securing your 12- to 16-month position after third year. (See page 8 for details.)

## FOURTH YEAR

Apply the skills and knowledge you've developed with the opportunity to complete a team-based design project.



## GRADUATION

Whether you plan to work in industry, start your own business or pursue further studies, you will graduate equipped with strong technical fundamentals, practical engineering knowledge and perspectives to address any challenge. Students in the Core Programs graduate with a Bachelor of Applied Science (BASc) and Engineering Science students graduate with a Bachelor of Applied Science in Engineering Science (BASc in EngSci).

mathematics, science, are not limited to:

### FOUNDATION YEAR 2

- » Ordinary Differential Equations, Probability and Statistics, Vector Calculus
- » Digital and Computer Systems
- » Quantum Mechanics, Thermodynamics
- » Electromagnetism, Waves
- » Systems Biology
- » Engineering, Society and Critical Thinking

With the Foundation Years behind you, you will now focus your studies on one of eight EngSci majors.

If you opted into the PEY Co-op Program, this year is particularly important in securing your 12- to 16-month position after third year. (See page 8 for details.)

Within your EngSci major, you'll have the opportunity to apply your knowledge, skills and talents through a team-based design project and an individual research thesis.



Solve a real-world challenge faced by a company through a collaborative industry-sponsored project at the **UofT INSTITUTE FOR MULTIDISCIPLINARY DESIGN & INNOVATION**



Go global by **STUDYING ABROAD** at 160+ partner universities worldwide



Join the **ALUMNI MENTORSHIP PROGRAM** and benefit from the insight and experience of our UofT Engineering alumni



Strengthen your leadership competencies through the **TROOST INSTITUTE FOR LEADERSHIP EDUCATION IN ENGINEERING**



Turn your idea into a startup through **THE ENTREPRENEURSHIP HATCHERY**



Gain complementary perspective on your studies through an **ENGINEERING MINOR OR CERTIFICATE** or through an **ARTS & SCIENCE MINOR** (page 19)

# ENGINEERING PROGRAMS AT A GLANCE

You can combine any of our 10 academic programs with a range of leadership, entrepreneurship, extracurricular and career-building opportunities — like our co-op program.

All of our programs are fully accredited\* and our degrees are recognized worldwide.

**5,200+**

Undergraduate Students

**1,400+**

International Students

**270+**

Faculty Members

**25+**

Research Institutes

**18**

Buildings

**9**

Academic Departments

\* Canadian Engineering Accreditation Board



## TRACKONE, UNDECLARED ENGINEERING

TrackOne is an undeclared first year designed for students interested in exploring all fields of engineering before joining a Core 8 program in second year. Students in this program spend their first year taking a wide range of courses. This approach helps you discover your interests within U of T Engineering while developing a strong foundation in key engineering principles. After successfully completing TrackOne, you are guaranteed\* a spot in the Core 8 program of your choice — Chemical, Civil, Computer, Electrical, Industrial, Materials, Mechanical or Mineral — for the remaining three years of your BASc degree.

### DID YOU KNOW?

The TrackOne community organizes game nights, study groups, beach parties and an annual dinner-dance called the **Eight Ball**. Alumni of the program often sew a TrackOne patch onto their coveralls or jackets.

### HELPING YOU DECIDE

The *Introduction to Engineering* course explores how each engineering field contributes to society, helping you choose your best fit within the Core 8 programs at the end of first year. Support from a dedicated TrackOne advisor will also help you with your decision.

The TrackOne curriculum is designed to parallel the courses taken by first-year students in the Core 8 programs. This allows TrackOne students to transition smoothly into second year.

\*TrackOne students who achieve a minimum average of 60% in both semesters are guaranteed entry to the Core 8 program of their choice in second year.



Learn more:  
[uofteng.ca/trackone](http://uofteng.ca/trackone)





## CHEMICAL ENGINEERING

Chemical engineers combine chemistry, biology, math and design to solve global challenges and create innovative processes and products. As one of the top chemical engineering programs in Canada, UofT Engineering is at the forefront of research to develop renewable fuels, use biotechnology to clean up pollution, manufacture products sustainably, create artificial organs, and fortify foods to address malnutrition. You'll put theory into practice in innovative courses and laboratories, including the unique Unit Operations Lab, filled with large-scale industrial equipment and a two-storey distillation column.

### AREAS OF FOCUS

- » Biomolecular and Biomedical Engineering
- » Bioprocess Engineering
- » Chemical and Materials Process Engineering
- » Environmental Science and Engineering
- » Informatics
- » Pulp and Paper
- » Surface and Interface Engineering
- » Sustainable Energy

### DID YOU KNOW?

In your fourth year, you'll get to design an industrial processing plant in just 10 weeks.

### SAMPLE CO-OP EMPLOYERS

Apotex  
Environment & Climate Change Canada  
Peel Plastic Products Ltd.  
Sanofi Pasteur  
Thermo Fisher

### SAMPLE CAREER TRAJECTORIES

Advanced Manufacturing  
Bioprocessing  
Finance  
Food Fortification  
Management Consulting



Learn more:  
[uofteng.ca/chemical](http://uofteng.ca/chemical)



## CIVIL ENGINEERING

Civil engineering focuses on the design, infrastructure and sustainability of the structures and systems that support our daily lives, from the deepest tunnels to the tallest buildings. You will learn from global experts in some of the world's most advanced and unique facilities. Your courses in applied structural mechanics, fluid mechanics, geology and engineering ecology will prepare you to create solutions that will directly impact quality of life, from designing disaster-resistant structures to building systems that supply clean water to remote communities.

### AREAS OF FOCUS

- » Building Science
- » Construction Management
- » Environmental Engineering
- » Mining & Geomechanics
- » Structural Engineering
- » Transportation Engineering & Planning

### DID YOU KNOW?

To learn the art and science of land and water surveying, civil and mineral engineering students take part in a two-week camp at beautiful Gull Lake, located three hours north of Toronto. Last year, camp celebrated its 100th anniversary.

### SAMPLE CO-OP EMPLOYERS

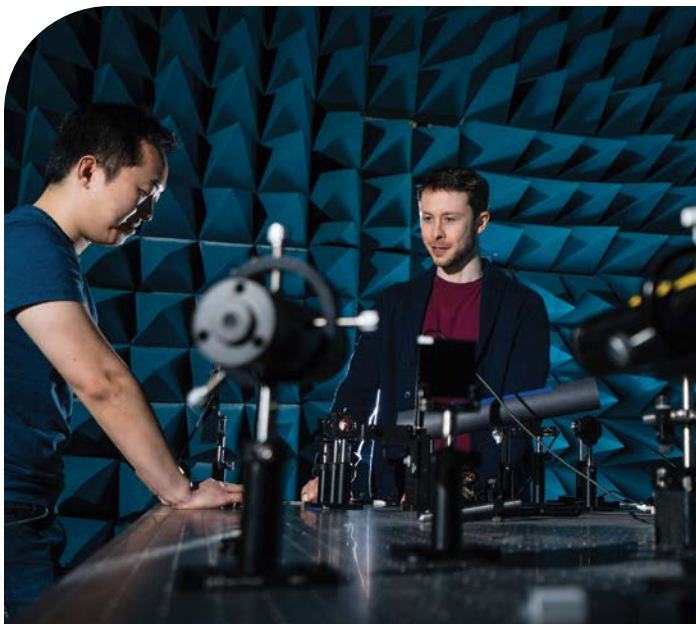
Aecon Construction  
EllisDon  
Ferrovia Agroman (U.S.)  
Toronto Hydro  
Toronto Transit Commission

### SAMPLE CAREER TRAJECTORIES

City Planning  
Energy Use and Supply  
Environmental Management  
Transportation and Infrastructure  
Water Treatment and Sustainable Use



Learn more:  
[uofteng.ca/civil](http://uofteng.ca/civil)



# ELECTRICAL & COMPUTER ENGINEERING

Electrical and computer engineers deal with many pressing challenges of our time, including the communication and control of digital information, and the generation and distribution of energy. In the first two years of both programs, you'll study design, math, digital systems, electronics, communication systems, computer architecture and software. In your upper years, you'll focus on two of six cutting-edge specializations. The electrical and computer engineering (ECE) programs are housed within the same department, giving you access to a breadth of engineering theory and practice to launch your career in fields like artificial intelligence, health care, sustainability and more.

## AREAS OF FOCUS

- » Analog & Digital Electronics
- » Communications, Signal Processing & Control
- » Computer Hardware & Networks
- » Electromagnetics & Energy Systems
- » Photonics & Semiconductor Physics
- » Software

## DID YOU KNOW?

Our ECE department is ranked number one — and one of the largest — in Canada. Toronto has the highest concentration of artificial intelligence startups in the world\*, and working in many of them are our students, professors and alumni.

## SAMPLE CO-OP EMPLOYERS

IBM  
Intel  
NVIDIA (U.S.)  
Scotiabank  
Zynga

## SAMPLE CAREER TRAJECTORIES

Artificial Intelligence  
Big Data  
Computer Security  
Medical Device Design  
Sustainable Energy

 Learn more:  
[uofteng.ca/ece](http://uofteng.ca/ece)

\*Source: [torontoglobal.ca/ai](http://torontoglobal.ca/ai)



# INDUSTRIAL ENGINEERING

Industrial engineers improve the way people interact with technologies and systems. They help organizations run safely, efficiently and profitably. You will begin the program by learning the foundations of industrial engineering: operations research, programming and human-centered design. In your upper years, you'll take courses ranging from engineering psychology to data analytics to business process optimization. For their ability to see "the big picture," you'll find industrial engineers applying their expertise everywhere, from streamlining health-care systems to rethinking supply chains and the online user experience in the era of artificial intelligence.

## AREAS OF FOCUS

- » Human Factors
- » Information Engineering
- » Operations Research
- » Artificial Intelligence & Machine Learning

## DID YOU KNOW?

Industrial engineering is closely tied to business and health care. Uof T's connections to Toronto's financial district and hospitals give you a significant career advantage.

## SAMPLE CO-OP EMPLOYERS

eBay  
Environment Canada  
Honda  
Royal Bank of Canada  
Walmart

## SAMPLE CAREER TRAJECTORIES

Big Data Analytics  
Health-care Engineering  
Financial Analysis and Planning  
Management Consulting  
Project Management

 Learn more:  
[uofteng.ca/industrial](http://uofteng.ca/industrial)





## MATERIALS ENGINEERING

Materials engineers design and develop new materials and advance processes for producing materials sustainably. You'll learn how to manipulate the structure and properties of materials at molecular and atomic levels from professors who have expertise with a range of applications, including renewable energy, biomaterials, automotive and aerospace. You'll graduate with a solid foundation in how materials behave, and experience in using state-of-the-art characterization techniques and computer simulations.

### AREAS OF FOCUS

- » Biomaterials
- » Computational Materials and AI Design of Materials
- » Manufacturing with Materials
- » Sustainable Materials Processing

### DID YOU KNOW?

The Department of Materials Science & Engineering is home to the Forensic Engineering certificate — a program that is unique in Canada.

### SAMPLE CO-OP EMPLOYERS

Celestica  
Enbridge  
Litens  
National Research Council of Canada  
Shawcore

### SAMPLE CAREER TRAJECTORIES

Advanced Electronics  
Biomaterials Engineering  
Clean Technologies  
Forensic Engineering  
Manufacturing  
Mining and Mineral Processing

 Learn more:  
[uofteng.ca/materials](https://uofteng.ca/materials)



## MECHANICAL ENGINEERING

Mechanical engineers understand the world as parts in motion: from cars to medical devices, all design uses mechanical engineering principles. Our program is renowned for its applied approach, where you'll put theory into practice through unique experiential opportunities both in the lab and in the field. You'll take courses in physics, risk assessment, thermodynamics, biomechanics and sustainable energy. You'll also learn about the physical principles of design: how individual components come together, and how to manufacture objects to make them safe, economical and easy to use.

### AREAS OF FOCUS

- » Bioengineering
- » Energy & Environment
- » Manufacturing
- » Mechatronics
- » Solid Mechanics & Design

### DID YOU KNOW?

Our M-Space rapid prototyping lab allows students to 3D print mechanical parts and build entire mechatronics systems, complete with embedded controllers and custom-made printed circuit boards.

### SAMPLE CO-OP EMPLOYERS

BMW (U.S.)  
Bombardier  
General Motors Canada  
Magna Group  
Ontario Power Generation

### SAMPLE CAREER TRAJECTORIES

Advanced Manufacturing  
Artificial Intelligence  
Communications Systems  
Robotics  
Sustainable Energy

 Learn more:  
[uofteng.ca/mechanical](https://uofteng.ca/mechanical)



# MINERAL ENGINEERING

Everything that humans use is either caught, grown or mined. Mineral engineering is the applied science of our interaction with the planet. What sets the Lassonde Mineral Engineering program apart is our broad approach to the discipline. Here, you'll learn mineral exploration, mine design and management, mineral processing and mining finance from researchers at the Lassonde Institute of Mining, as well as industry professionals. Your degree will give you the expertise to lead the way in making mining more sustainable, safe and productive.

## AREAS OF FOCUS

- » Environmental Impact & Risk Assessment
- » Mining Economics & Finance
- » Mine Design
- » Surface & Underground Mining
- » Mineral Processing
- » Wastewater Management

## DID YOU KNOW?

Toronto is the mining finance capital of the world and home to more than 1,600 mining company headquarters.

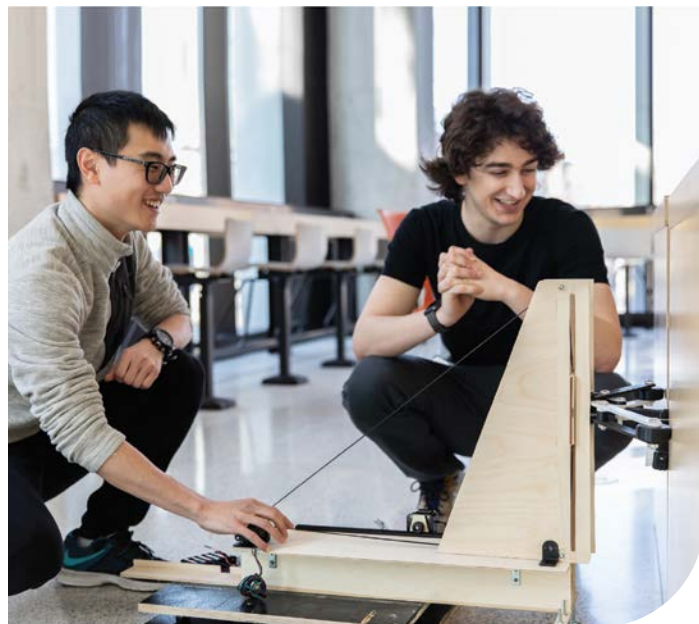
## SAMPLE CO-OP EMPLOYERS

Kinross Gold Corp.  
Pretium Exploration  
Suncor Energy  
Teranga Gold  
Vale

## SAMPLE CAREER TRAJECTORIES

Consulting  
Mine and Business Management  
Sustainable Mining Practices  
Transportation

 Learn more:  
[uofteng.ca/mineral](http://uofteng.ca/mineral)



# ENGINEERING SCIENCE

One of the most distinguished engineering programs in the world, Engineering Science (EngSci) is designed for students who are looking for an intense academic challenge in a supportive and collaborative environment. In your first two years, you'll be immersed in engineering, math, science, computing, design and social science. In your last two years, you'll build on this multidisciplinary foundation and choose from one of eight majors for accelerated, discipline-specific learning. Our students thrive in a close-knit community of exceptional individuals, creating an enriched and unique learning experience.

## ENGINEERING SCIENCE MAJORS

- » Aerospace Engineering
- » Engineering Mathematics, Statistics & Finance
- » Biomedical Systems Engineering
- » Engineering Physics
- » Electrical & Computer Engineering
- » Machine Intelligence
- » Energy Systems Engineering
- » Robotics Engineering

## DID YOU KNOW?

U of T is one of the few institutions worldwide to offer a program that integrates enriched science fundamentals with engineering. The EngSci curriculum is nimble with dynamic majors that evolve and anticipate emerging technologies.

## SAMPLE CO-OP EMPLOYERS

Advanced Micro-Devices (AMD)  
Intel  
Molson Coors Brewing Co.  
Royal Bank of Canada  
SAFRAN Landing Systems

## SAMPLE CAREER TRAJECTORIES

Roughly half of EngSci grads pursue graduate studies in engineering and science, or professional degrees such as business, medicine and law. The balance enter the workforce in a wide range of careers across all industries, or start their own companies.

 Learn more:  
[uofteng.ca/engsci](http://uofteng.ca/engsci)



# ENGINEERING MINORS & CERTIFICATES

 Learn more:  
[uofteng.ca/minors](http://uofteng.ca/minors)

Choosing an engineering minor or certificate is a powerful way to graduate with an extra set of credentials, or explore an area of interest, while earning your degree. As an engineering student, you can also pursue a minor through the Faculty of Arts & Science — such as Bioethics, Indigenous Studies and Urban Studies.

To obtain an engineering minor or certificate, you complete a set number of specified and optional courses — six for a minor and three for a certificate. For example, if you're interested in the Engineering Business minor, you would take courses in engineering economics, accounting and finance, competitive strategy and people management, plus two courses from a list of electives. When you graduate, your minor or certificate will appear on your transcript.

More than 70% of  
our students graduate  
with an engineering  
minor or certificate



## ADVANCED MANUFACTURING MINOR

The most intensive research and development sector in Canada is manufacturing. Courses in this minor cover an array of competencies, all of which can be broadly applied to areas like biomedical, automotive, aerospace and energy.



## ENVIRONMENTAL ENGINEERING MINOR

Delve into topics such as ecological impact, risk assessment, environmental microbiology, hydrology, preventive engineering, climate change, and the social and environmental impact of technology. (part of U of T's Sustainability Scholar designation)



## ARTIFICIAL INTELLIGENCE ENGINEERING MINOR

Toronto is a global hub for AI. By exploring concepts such as data mining, neural networks and deep learning, you will be prepared to create solutions to the complex challenges facing this growing field.



## MUSIC PERFORMANCE MINOR

This unique program is designed for exceptional musicians who are interested in combining their artistic and technical pursuits. Through our partnership with the Faculty of Music, you will have access to a performance-based program, including courses typically only offered to music students.



## BIOENGINEERING MINOR

With topics extending across life sciences, from forestry and ecology to biological waste treatment and health care, this minor offers a wealth of possibilities, from biofuels to pharmaceuticals.



## NANOENGINEERING MINOR

Reflecting a growing focus on engineering materials and devices at the nano scale, this minor is applicable to many sectors including electronics, communications, energy and medical diagnostics.



## BIOMEDICAL ENGINEERING MINOR

This highly focused minor examines engineering's intersection with medicine and biomedical technology. Courses cover physiological control systems, bioinstrumentation, biomechanics and a choice of lab or design experience.



## ROBOTICS & MECHATRONICS MINOR

Explore robotic and mechatronic systems involved in consumer products, industrial uses and adaptive technologies. Courses cover topics such as micro-electromechanical systems and new system-level principles underlying embedded systems.



## ENGINEERING BUSINESS MINOR

This minor represents a powerful collaboration between U of T Engineering and the Rotman School of Management. Our most popular minor, it provides knowledge of finance, economics, business management and marketing from an engineering perspective.



## SUSTAINABLE ENERGY MINOR

The need for greener, more sustainable energy resources is critical. Topics in this minor focus on the sustainable use of energy, energy-demand management and public policy related to sustainability. (part of U of T's Sustainability Scholar designation)

## ENGINEERING CERTIFICATES

- » Artificial Intelligence Engineering
- » Communication
- » Engineering Business
- » Engineering Leadership
- » Entrepreneurship, Innovation & Small Business
- » Forensic Engineering
- » Global Engineering  
(part of U of T's Global Scholars designation)
- » Mineral Resources
- » Music Technology
- » Nuclear Engineering
- » Renewable Resources Engineering

# HOW TO APPLY

 Learn more:  
[uofteng.ca/apply](https://uofteng.ca/apply)

The U of T Engineering admissions committee carefully considers each applicant's academic performance and activities outside the classroom. Once we have received your application through the Ontario Universities' Application Centre (OUAC), we will send you a link to complete a mandatory Online Student Profile (OSP). Your OSP will be used along with your academic transcripts and OUAC application to make an admission decision.

## 1

### APPLY ONLINE BY JANUARY 13

Submit your application online through the **Ontario Universities' Application Centre (OUAC)** at [ouac.on.ca](https://ouac.on.ca) starting in early October. Shortly after you submit your application we will send you an email acknowledgement with instructions on how to access your account on the Engineering Applicant Portal. The OUAC application deadline is January 13, 2022. For early consideration, 101 applicants should apply by December 1, 2021 and 105 applicants should apply by November 7, 2021.

## 2

### SUBMIT YOUR ONLINE STUDENT PROFILE AND DOCUMENTS BY FEBRUARY 1

Log in to your Engineering Applicant Portal to complete your **Online Student Profile (OSP)** — where you can tell us more about yourself, including your academic history, extracurricular involvement, the programs you want to be considered for, and your interest in co-op. Through the Portal, please upload transcripts for your studies to date (completed and in progress) from the start of high school. English proficiency test results must be sent electronically directly from the testing service. Your application will be reviewed once all components of your OSP are complete.

## 3

### APPLY FOR RESIDENCE BY MARCH 31

**Residence is guaranteed for all new full-time students entering their first year of university in an undergraduate program for the first time.**

You will need to indicate your interest in residence by completing the **First Year StarRez application** by March 31, 2022, and receive and accept an offer of admission by June 1, 2022. Students must respond to all deadlines and meet all deposit requirements to maintain their eligibility. For full details, please visit [uofteng.ca/housing](https://uofteng.ca/housing).

## 4

### TRACK THE STATUS OF YOUR APPLICATION

Log in to your **Engineering Applicant Portal** account regularly to see what documents have been received in support of your application and to provide updated grades, transcripts and achievements. This is also where you can ensure that your Online Student Profile is complete and track your admission status. When a decision is made, it will be posted here first.

## ACADEMIC REQUIREMENTS

### CANADA

**ONTARIO:** English (ENG4U); Advanced Functions (MHF4U); Calculus and Vectors (MCV4U); Chemistry (SCH4U); Physics (SPH4U); and an additional U or M course

**ALBERTA/NW TERRITORIES/NUNAVUT:** Math 30-1; Math 31; Chemistry 30; Physics 30; and ELA 30-1

**BRITISH COLUMBIA/YUKON:** Pre-Calculus 12; Calculus 12 or AP Calculus; Chemistry 12; Physics 12; and English Studies 12 or English First Peoples 12

**MANITOBA:** Pre-Calculus Math 40S; AP Calculus 42S or Calculus 42U or Calculus 45S + Advanced Mathematics 45S; Chemistry 40S; Physics 40S; and ELA 40S

**NEW BRUNSWICK:** Calculus 120; Pre-Calculus A120; Pre-Calculus B120; Chemistry 121 or 122; Physics 121 or 122; and English 120, 121 or 122

**NEWFOUNDLAND/LABRADOR:** Math 3200; Math 3208; Chemistry 3202; Physics 3204; and English 3201

**NOVA SCOTIA:** Pre-Calculus 12; Calculus 12 or AP Calculus; Chemistry 12; Physics 12 and English 12

**PRINCE EDWARD ISLAND:** Mathematics 621A or 621B; Mathematics 611B; Chemistry 611 or 621; Physics 621; and English 621

**QUEBEC CEGEP:** 12 academic courses including one course in Algebra, and two courses each in Calculus, Chemistry, Physics and English. Applicants with 24 courses including prerequisites will be considered for advance standing credit.

**SASKATCHEWAN:** Pre-Calculus 30; Calculus 30; Chemistry 30; Physics 30; and ELA A30 + B30

Note: Please contact us if your school does not offer Calculus



# FINANCES



Learn more:  
[uofteng.ca/finances](https://uofteng.ca/finances)

## SCHOLARSHIPS & AWARDS

All high school applicants to U of T Engineering are automatically considered for most admission scholarships on the basis of their academic achievement and extracurricular involvement (as detailed in the Online Student Profile). Some scholarships and awards require a separate application. Engineering applicants are also eligible for several University-wide scholarships. Major U of T scholarships requiring nomination include the **National Scholarship** for Canadian high school students and the **Lester B. Pearson International Scholarship** for international students.

## FINANCIAL AID

### UNIVERSITY OF TORONTO ADVANCE PLANNING FOR STUDENTS

We are committed to ensuring that no admitted domestic student<sup>1</sup> is unable to enrol in or complete their studies due to lack of financial means. This commitment led to the creation of a unique financial aid program called

**University of Toronto Advance Planning for Students (UTAPS).** Through a non-repayable grant, UTAPS covers unmet financial need after a student has received a maximum amount of support through government assistance (e.g., OSAP for Ontario students).

### U.S. STUDENT AID

U.S. citizens can apply for financial assistance from the U.S. William D. Ford Federal Direct Loan Program. U of T is a recognized post-secondary institution for Federal Direct Loans (PLUS/Subsidized/Unsubsidized). Education Savings Plans and U.S. Federal Education Tax credits are also applicable. For details, please visit [uofteng.ca/usloans](https://uofteng.ca/usloans).

### SPONSORED STUDENTS

As a top-ranked world institution, the University of Toronto is an approved destination for most countries' national mobility scholarship programs.

## COSTS

2021-2022 tuition and incidental fees for full-time studies are presented below in Canadian dollars; 2022-2023 fees are subject to change. For a full breakdown of residence options and costs, visit [uofteng.ca/housing](https://uofteng.ca/housing).

	DOMESTIC	INTERNATIONAL
<b>Tuition</b>	\$14,180	\$62,250
<b>Incidental Fees</b>	\$1,816.60	\$1,816.60 <sup>2</sup>
<b>Residence &amp; Meal Plan</b>	\$11,016– \$21,567	\$11,016– \$21,567
<b>Books &amp; Supplies</b>	\$1,500– \$2,000+	\$1,500– \$2,000+
<b>PEY Co-op</b>	Co-op is optional for engineering students. You can opt into co-op during the U of T Engineering application process as outlined on page 20. The total co-op program fee is \$3,600, payable in six installments over three years starting in your second year. There is no cost to participate in co-op programming in your first year.	

1. International students are not eligible for need-based financial aid
2. International students are required to purchase health insurance through UHIP (\$756 for 2021-2022)

## INTERNATIONAL

**AMERICAN SYSTEM:** Grade 12 at an accredited high school with a high GPA. Competitive candidates should have two years of Chemistry and Physics, as well as senior Calculus (AP, Honors or equivalent). Those unable to take more than one year of Chemistry or Physics, or who are not taking an AP course in that subject, should contact Engineering Admissions prior to applying. For 2022 admission, U of T is test-optional; however we encourage students to submit any completed SAT, ACT or AP exams.

**BRITISH PATTERNED SYSTEM:** Three A-Levels including Mathematics and Physics. Chemistry is strongly recommended as the third A-Level. Applicants are required to present at least AS-Level Chemistry.

## ENGLISH LANGUAGE REQUIREMENTS

If your first language is not English, you must present proof of English facility prior to admission consideration, unless you have completed four years of full-time study in an English language school in a country where the predominant language is English. For applicants who are required to present proof of English facility and are taking Grade 12 English (e.g., ENG4U), you must achieve at least 70% in this course. For details on required scores and acceptable tests, please visit [uofteng.ca/elt](https://uofteng.ca/elt).

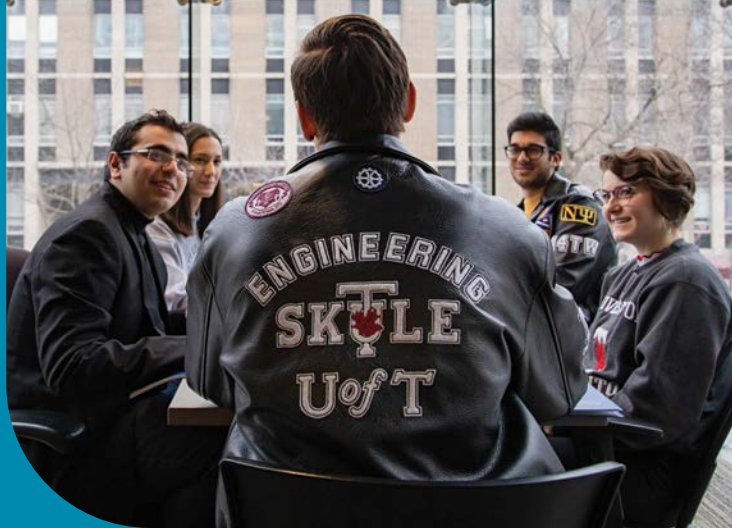
**INDIAN SYSTEM:** Mathematics, Chemistry and Physics at the Grade 12 level. Completion of the All India Senior School Certificate awarded by CBSE, or the Indian School Certificate awarded by CISCE, or Year 12 State Board Exams with excellent results.

**INTERNATIONAL BACCALAUREATE (IB) DIPLOMA:** Mathematics Analysis and Approaches HL (recommended) or SL or Mathematics Applications and Interpretations HL; Physics, Chemistry and English at either level.

Note: U of T Engineering does not grant advanced standing for A-Levels, AP or IB courses.

## INTERNATIONAL FOUNDATION PROGRAM (IFP)

The IFP is available to academically qualified international students graduating from an international high school with English facility test scores just below the required minimum. For details, visit [internationalprograms.utoronto.ca](https://internationalprograms.utoronto.ca).



## IT'S EASY TO STAY ON TOP OF WHAT'S HAPPENING AT UofT ENGINEERING

engineering@utoronto.ca  
+1 416-978-3872  
discover.engineering.utoronto.ca

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to register for a student-led tour



# Engineering