



UNIVERSITY
OF ALBERTA

FACULTY OF ENGINEERING

VIEWBOOK
2027
2028



OUR VISION

is to be the most daring
engineering community
on the planet.

For over 110 years, the University of Alberta's Faculty of Engineering has prepared the next generation of engineers. We provide unparalleled education through our world-class facilities, innovative programming and award-winning teachers and researchers.

Territorial Acknowledgement

The University of Alberta respects the sovereignty, lands, histories, languages, knowledge systems and cultures of all First Nations, Métis and Inuit nations.

The University of Alberta, its buildings, labs and research stations are primarily located on the territory of the Nêhiyaw (Cree), Niitsitapi (Blackfoot), Métis, Nakoda (Stoney), Dene, Haudenosaunee (Iroquois) and Anishinaabe (Ojibway/Saulteaux), lands that are now known as part of Treaties 6, 7 and 8 and homeland of the Métis.



#5 IN CANADA
FOR **ENGINEERING
PROGRAM***



#1 IN CANADA
AND **#3** GLOBALLY
FOR **PETROLEUM
ENGINEERING†**



#4 IN CANADA
FOR **CHEMICAL
ENGINEERING†**



#3 IN CANADA AND
#10 GLOBALLY
FOR **MINING
AND MINERAL
ENGINEERING†**



#5 IN CANADA
FOR **ELECTRICAL
AND ELECTRONIC
ENGINEERING†**



#6 IN CANADA FOR
**MECHANICAL AND
AERONAUTICAL
ENGINEERING†**



10 FULLY-ACCREDITED
**UNDERGRADUATE
PROGRAMS**



\$7.5M
IN FINANCIAL SUPPORT
**AWARDED
ANNUALLY**



\$85M
IN RESEARCH FUNDING
EVERY YEAR

* TIMES HIGHER EDUCATION (THE)
WORLD UNIVERSITY RANKINGS

† QS WORLD UNIVERSITY RANKINGS
BY SUBJECT

The outside of the Donadeo Innovation Centre for Engineering on U of A's North Campus.

FIRST-YEAR ENGINEERING

Your first year is all about introducing you to the core aspects of engineering as well as the vast opportunities for studying and working in the profession. Not only will you learn and grow, but you'll also discover how to shape your future career. You will choose an area of specialization after your first year.

First-year includes:

- Lecture courses
- Hands-on labs
- Interactive seminars
- Approximately 15 hours in classes per week
- Building a core understanding in:
 - Chemistry
 - Physics
 - Engineering Mathematics
 - Engineering Design

uab.ca/BScEngg

Discover career exploration materials developed with faculty subject matter experts at uab.ca/eecnx



Engineering students Nandana, Isabella and Michael enjoying the Engineering Students' Society GEER Lounge.



ENGINEERING PROGRAMS

Following the foundational first year, students pursue a program and choose between the traditional or co-operative (co-op) education routes.

Programs with traditional or co-op routes:

- Chemical engineering
- Chemical engineering — bioprocessing and biomanufacturing option
- Chemical engineering — clean energy and sustainable process systems option
- Chemical engineering — computer process control option
- Civil engineering
- Civil engineering — environmental engineering option
- Computer engineering
- Computer engineering — nanoscale system design option
- Electrical engineering
- Electrical engineering — nanoengineering option
- Engineering physics
- Materials engineering
- Mechanical engineering
- Mining engineering
- Petroleum engineering

Co-op only programs:

- Computer engineering — software option
- Mechanical engineering — biomedical option
- Mechatronics and robotics engineering

Bachelor of Science in Engineering — Transfer program at Campus Saint-Jean

This one-year program offers students the opportunity to complete their first-year engineering courses entirely in French and within a Francophone environment. The academic requirements and course content are identical to those of the English program offered by the Faculty of Engineering. All courses in this program must be completed within a single academic year. Students interested in this program must meet French Language Proficiency in addition to the academic requirements.

Chemical Engineering

Chemical engineers focus on processes — always looking to design, create and improve ways of turning raw materials into finished products.

You can see their work in all facets of daily life, from products like food, pharmaceuticals and cosmetics to the sustainable and renewable production of energy or the development of solutions for cleaner air and water.

PROGRAM HIGHLIGHTS

- #4 chemical engineering program in Canada (QS)
- Chemical engineering is an in-demand career across Canada
- Our Computer Process Control option is unique in North America: a specialized undergraduate option not available elsewhere, with wide-reaching industrial applicability
- Upper-year classes include subjects like Coffee and Chemical Engineering or Energy and the Environment

KEY INDUSTRIES:

- Bioprocessing and biomanufacturing
- Carbon-neutral technologies
- Food processing
- Natural resources and critical minerals
- Oil and gas
- Pharmaceuticals
- Product development (paper, textiles, biofuels, etc.)
- Renewable and sustainable energy

Engineering student Abhijeet running a process control experiment.



Chemical Engineering — Bioprocessing and Biomanufacturing Option

This option is built around the chemical engineering core program. Graduates from this option will be uniquely positioned to design and analyze biochemical processes and biological systems related to the manufacturing of biofuels, pharmaceuticals, biomaterials and other bioproducts.

Chemical Engineering — Clean Energy and Sustainable Process Systems Option

This option is built around the chemical engineering core program. Students in this option will acquire a robust understanding of the theoretical principles, as well as hands-on skills, in areas such as renewable energy production, electrochemical processes, energy storage and transformation technologies, fuel cells, hydrogen production and carbon capture and storage.

Chemical Engineering — Computer Process Control Option

This option is built around the chemical engineering core program. Additional specialized courses will help you develop skills as a Process Control and Systems Engineer. You'll also be able to contribute to the development, design, optimization, operation and control of the next generation of smart plants and sustainable chemical processes.

“

Science has always sparked my curiosity, but it was through hands-on challenges that I discovered my passion for engineering. From building a weight-bearing tower for the Association of Professional Engineers and Geoscientists of Alberta (APEGA) competition — where our school team earned bronze — to helping create a virtual Women in STEM Career Fair, I’ve seen how innovation can drive meaningful change.”

KAYLIE

First-year engineering student



Civil Engineering

Civil engineers plan, design, construct and operate. They manage airports, buildings, bridges, harbours, highways, flood control structures, transit systems, water supply and distribution systems, waste collection and storm drainage and other public works. Building better futures also means addressing environmental impacts and sustainability concerns.

PROGRAM HIGHLIGHTS

- Experiential learning through labs, fieldwork and design-based courses
- Two-term capstone design project addressing complex, real-world infrastructure challenges
- Opportunities for work experience during your degree with some of Canada’s most prominent infrastructure and resource development companies located in Alberta

KEY INDUSTRIES:

- Construction
- Energy and utilities
- Environmental
- Geotechnical
- Structures
- Transportation
- Water resources



Civil Engineering – Environmental Engineering Option

Environmental engineers protect natural ecosystems, human health and quality of life by applying engineering principles to solve environmental and public health-related challenges. They tackle complex tasks like designing and managing water systems, performing environmental impact assessments and monitoring the environment.

PROGRAM HIGHLIGHTS

Hands-on learning with specialized equipment in the Natural Resources Engineering Facility (NREF) such as:

- Sand filter apparatus for granular filtration of contaminated water
- Sedimentation column
- High-volume sampler for particulate matter in the air

KEY INDUSTRIES:

- Environmental and geoenvironmental consulting
- Mining
- Oil and gas
- Public health
- Utilities
- Waste management



PhD student Christopher and MSc student Romina preparing antenna measurements in the M3 Laboratory's near-field anechoic chamber.

Computer Engineering

Computer engineers play a critical role in designing the computing platforms and intelligent systems that shape our daily lives. While many innovations may appear as simple “apps,” behind them are complex architectures, embedded processors, communication networks and secure software systems created by computer engineers.

PROGRAM HIGHLIGHTS

- Courses cover topics in computer hardware, software, machine learning and artificial intelligence
- Flagship hackathon coding competition hosted annually by the Computer Engineering Club

KEY INDUSTRIES:

- Artificial intelligence
- Cybersecurity
- Manufacturing
- Medicine
- Technology
- Transportation

Electrical Engineering

From the devices we use every day — advanced robotics and instrumentation to large-scale telecommunications and data storage applications — electrical engineers focus on the design and development of electrical, electronic and electromagnetic systems.

They also develop electrical devices and work with systems that transmit, distribute, store, control and use electromagnetic energy or electrically-coded information.

PROGRAM HIGHLIGHTS

- #5 electrical engineering program in Canada (QS)

KEY INDUSTRIES:

- | | |
|--------------------------------|----------------------|
| ▪ Computers and semiconductors | ▪ Manufacturing |
| ▪ Energy | ▪ Telecommunications |
| ▪ Defense | ▪ Transportation |
| | ▪ Utilities |

Engineering Physics

Engineering physicists focus on areas as diverse as applied science, information technology and health and safety. This area of engineering has helped discover breakthroughs in sectors such as energy and medical robotics.

PROGRAM HIGHLIGHTS

- Students start with a strong foundation in math and physics
- Participate in cutting-edge research projects in areas such as semiconductors and microelectronics, robotic systems, fibre-optic communications, quantum technologies, nuclear engineering and fusion energy

KEY INDUSTRIES:

- | | |
|--------------------------|----------------------------------|
| ▪ Automotive | ▪ Defense |
| ▪ Aviation and aerospace | ▪ Medical research and equipment |
| ▪ Consumer electronics | |

Computer Engineering — Software Engineering Option

Software engineering focuses on building reliable, large-scale software systems using structured engineering principles. This program teaches students how to develop complex software — including AI technologies — with a focus on security, practicality and maintainability.

PROGRAM HIGHLIGHTS

- Learn how to design, build, test and maintain modern, intelligent software
- Co-op opportunities with top tech companies for real-world experience

KEY INDUSTRIES:

- Automotive and aerospace
- Finance and banking
- Gaming and entertainment
- Healthcare
- Technology



Engineering students in the Elko Engineering Garage.

Materials Engineering

Materials engineers are innovators who figure out how stuff works — from the rare metals in your phone to the plastics in your sneakers. They blend science and creativity to make materials stronger, lighter and even more eco-friendly for use in things like space missions, medical devices and green technology.

If you love puzzles, sustainability and building things that change the world, this is the program for you.

PROGRAM HIGHLIGHTS

Excel in cutting-edge fields—our programs lead in:

- Corrosion/wear-resistant supermaterials (think indestructible engines!)
- Manufacturing
- Mineral processing
- Nanoscale technology
- Renewable energy innovation
- Welding/joining

KEY INDUSTRIES:

- Advanced manufacturing
- Aerospace and space exploration
- Biomedical technology
- Electronics and nanotechnology
- Renewable energy
- Sustainable construction



Students working in the Machine Shop in the Mechanical Engineering Building, a space that supports researchers, students and other groups both on and off-campus in completing project builds.

Mechanical Engineering – Biomedical Engineering Option

By applying engineering principles to medical problems, biomedical engineers improve people's quality of life and help save lives! In collaboration with medical professionals, biomedical engineers design therapeutic systems, software, equipment and devices to advance human health outcomes.

PROGRAM HIGHLIGHTS

- Complete mechanical engineering degree with dedicated courses in biomedical engineering
- Co-op program only with optional placements in biomedical areas

KEY INDUSTRIES:

- Government
- Healthcare
- Medical sector
- Research

Mechanical Engineering

Mechanical engineers constantly create, rethink and redesign the machines and mechanical systems we depend on. From tiny life-saving devices to the engines, machines and plants that power our world, mechanical engineering's impact is profound.

PROGRAM HIGHLIGHTS

- #6 mechanical engineering program in Canada (QS)
- The Machine Shop: an open lab designed to allow students and visitors to observe research, project builds and experiential learning activities
- Hands-on vehicle build and competition in second-year design course (MEC E 260)

KEY INDUSTRIES:

- Building systems
- Defence
- Energy
- Healthcare
- Manufacturing
- Transportation

Master's student Delaney studies osseointegration in a bone implant in the Faculty of Engineering's Biomedical Engineering Department.

U of A students working on a car powered by a hydrogen fuel cell they have designed and built from scratch.



Engineering students, Eren and Mohammad, conducting a neurotechnology experiment, setting up an electroencephalogram (EEG) headset.



Engineering student, Yuezhen, completing a collaborative robotics experiment, operating and monitoring a robotic arm and performing object manipulation tasks using a tablet controller.

Mechatronics and Robotics Engineering

Mechatronics and robotics engineers design intelligent systems by integrating mechanical, electrical and computing technologies including artificial intelligence.

This interdisciplinary field drives innovation in both automation and human-machine interaction, leading to advances in autonomous vehicles, healthcare robotics, smart manufacturing and other cutting-edge technologies across diverse industries.

PROGRAM HIGHLIGHTS

- First mechatronics and robotics engineering degree program in the Prairie provinces
- Hands-on design projects every year and co-op work terms throughout the program, providing real-world experience.

KEY INDUSTRIES:

- Advanced manufacturing
- Automotive and autonomous vehicles
- Bionic and prosthetic systems
- Construction and building automation
- Entertainment and gaming
- Micro- and nano-robotics
- Surgical robotics
- Telerobotics



Engineering students learning about how land is reclaimed and ecological performance is monitored once mining is completed.

Mining Engineering

Mining engineers are involved in every aspect of responsible resource extraction and manage projects that provide the world with precious and base metals.

These critical minerals and clean energy sources are required to construct the modern amenities we all rely on: cell phones, computers, electric vehicles, solar panels, healthcare, infrastructure and much more.

PROGRAM HIGHLIGHTS

- #3 mining engineering program in Canada (QS)
- #10 mining engineering program globally (QS)
- 100% graduate employment rate

KEY INDUSTRIES:

- Automation
- Energy
- Environment
- Mining
- Research

Petroleum Engineering

Petroleum engineers solve real-life problems by exploring oil, natural gas, geothermal energy resources and underground storage of hydrogen and carbon dioxide.

By developing new technologies, they explore the management of subsurface energy resources safely and economically while preserving and protecting the environment.

PROGRAM HIGHLIGHTS

- The only accredited petroleum engineering degree program in Canada
- #3 petroleum engineering program globally (QS)
- Situated in Canada's primary energy innovation and production region
- Opportunities to contribute to numerous research and collaborative partnerships within the energy industry

KEY INDUSTRIES:

- Carbon capture and storage
- Environment
- Geothermal energy
- Government
- Hydrogen storage
- Oil and natural gas
- Research



Student working in the oil sands laboratory.



“

I was fortunate to meet many strong and courageous women, both in my discipline and in my sorority, who motivated me and supported me through every design project, quiz and late night in the lab. Now, I'm passionate about breaking down complex social barriers for women and girls and empowering them to feel confident in pursuing engineering degrees, careers and pathways.”

ALYSSA

Recent graduate, petroleum engineering, from Vancouver Island, BC

WORK EXPERIENCE DURING YOUR DEGREE

Co-op Program

Co-op programs build work experience into your degree. Since 1981, the Faculty of Engineering's Co-operative Education and Work-Integrated Learning Canada (CEWIL) accredited co-op program has been a national leader preparing students for the demands of an ever-changing industry.

Students learn from industry leaders and make meaningful contributions to their communities.

- 2nd largest co-operative education program in Western Canada
- 2,200 placements a year
- Up to 20 months of paid, hands-on training and practical experience prior to graduation
- A dedicated team of professionals supporting you
- Over 88% of our students obtain a work placement

Recent placements:

- | | |
|-------------------------------------|--------------------------|
| ▪ Alberta Health Services | ▪ Kadant Carmanah Design |
| ▪ ATCO | |
| ▪ Bird Construction | ▪ Siemens |
| ▪ City of Edmonton | ▪ Stantec |
| ▪ Drivewyze | ▪ Wyvern |
| ▪ ISL Engineering and Land Services | |

uab.ca/enggcoop



“

My co-op placements, all in different areas of the energy industry (Peloton Computer Enterprises, Imperial Oil and Whitecap Resources), have given me a strong starting toolkit for the rest of my career. At Imperial Oil, I got the amazing opportunity to develop a water usage study of the entire refinery and to determine and pitch projects that could reduce water usage 20% by 2030. Not only did I get to exercise my engineering competency in an impactful real world project, but I also got to contribute to a sustainable cause.”

SERENA

Recent graduate, chemical engineering



Engineering Career Connections

Delivers innovative, engineering-tailored career development resources and networking opportunities that empower our students to find their purpose.

From the beginning of your program, traditional and co-op students will have access to:

RESOURCE VAULT

Actionable career advice, information and tools to help you explore career possibilities and succeed in finding employment.

CAREER EVENTS

Direct insights into industries and career path options, plus opportunities to form connections and develop professional networks.

ENGG CAREER NEWS

A curated weekly newsletter that keeps subscribers informed about career opportunities, recruitment events and more.

uab.ca/eec



DID YOU KNOW?

This past year, 2,287 engineering students had co-op placements (the most in the history of the program)!

Experiential Learning and More

Expand your knowledge and apply for a certificate or minor (based on completion of specific academic courses and a minimum GPA), or get involved in research!

Certificates and minors

- Opt to add a certificate in sustainability or certificate in innovation and entrepreneurship.
- Engineering students are eligible to add an optional minor in arts or science to their area of study. This requires careful degree planning with an advisor.

Undergraduate research

Imagine being involved in leading-edge research for affordable solar energy or in the development of new materials that fight bacteria.

You can enhance your educational experience by getting involved with high-level research projects being conducted by your own professors, through programs like:

- Co-op
- I-STEAM Pathways
- Undergraduate Research Initiative

International experiences

The Faculty of Engineering is committed to offering a global learning environment and supporting student career aspirations through exchange programs and work or education abroad!

uab.ca/engg-el

ACADEMIC AND WELLNESS SUPPORTS

It's simple — we're here to help you succeed! In addition to the diverse range of academic and wellness supports provided at the University of Alberta, the Faculty of Engineering offers a comprehensive range of student services customized specifically for engineering students.

This includes:

- Academic advising
- Career resources
- Preparing to graduate
- Tutoring

uab.ca/engghelp



Engineering Student Success Centre (ESSC)

This centre is here to support you! ESSC provides free group and one-on-one tutoring to help develop academic skills and ensure success in any engineering program.

Student Spaces

ENGINEERING INCUBATOR

Whether you're curious about venturing into the dynamic world of entrepreneurship, developing a new prototype or looking to scale an existing tech-based initiative, we support students and alumni through this journey.

ELKO ENGINEERING GARAGE

Discover this 6,000 square foot makerspace on the second floor of the Engineering Teaching and Learning Complex (ETLC). Students and staff have free access to:

- 3D printers
- Woodworking
- Metalworking
- Textiles and electronics equipment

Current engineering students working in the Engineering Student Success Centre (ESSC).



Students attending the Dean's Welcome Breakfast for the fem+ Mentorship Program in the Engineering Teaching + Learning Complex Solarium.

fem+ Engineering Mentorship Program

Thinking about engineering, but unsure if it's the right fit? You can sign up to be mentored by a U of A engineering student!

fem+ is a hybrid 7-month program for women, non-binary and 2SLGBTQ+ high school students interested in exploring engineering's possibilities!

Applications are only open in September.

uab.ca/fem or email femprog@ualberta.ca



“

Having a passion for 3D printing, computer-aided design and robotics, I am thrilled by the opportunity to pursue the University's Mechatronics and Robotics Engineering Cooperative program that launched in 2024.”

EYTHAN

First-year engineering student, from Red Deer County, AB

STUDENT CLUBS, GROUPS AND MORE!

We don't just want you to learn here; we want you to love it here! Joining the Faculty of Engineering offers you the chance to thrive in a vibrant, diverse community.

Student Clubs + Teams:



Alberta Advanced Robotics Club (AARC)

This club's mission is to spearhead the growth of robotics. Each year, they compete in the Advanced Robotics Competition against 32 international universities. Last year, they placed #1 in Canada and #8 overall.



Great Northern Concrete Toboggan Race (GNCTR)

Each year, this student group designs a concrete toboggan that they race against other schools from across Canada. This year, the team won 11 awards and took home first place.



Student Team for Alberta Rocketry Research (STARR)

This team focuses on expanding Alberta's space industry through the development, testing, and launching of high-altitude sounding rockets. Each year they compete in international rocket engineering competitions.



“

I participated in a number of research projects during my degree, including the development of a portable laser system to drastically reduce the cost of soil testing for rural communities, and I took on various student group leadership positions. These opportunities allowed me to explore and find a career path perfectly suited to me.”

ABHAY

Recent graduate, mechanical engineering – biomedical specialization

The Student Engagement Leadership Program

This program offers undergraduate engineering students the opportunity to contribute meaningfully to campus life while developing leadership and professional skills.

Student Leaders serve as role models and ambassadors for their program and the Faculty of Engineering, welcoming and supporting new and future students through key initiatives throughout the academic year.

uab.ca/sel

As a student leader, you will:

- Gain practical experience in leadership, teamwork and communication
- Access exclusive annual leadership and networking events
- Build your on-campus network
- Share your experiences with current and future students
- Earn volunteer hours
- Receive a reference letter outlining your achievements in the program



THIS COULD BE YOU!

Students for the Exploration and Development of Space (SEDS)

SEDS is a student-run non-profit with the mission to strengthen Canada's future in space by providing post-secondary students with unique projects, research programs and professional development opportunities in the Canadian governmental, industrial and institutional space sectors.

Jennifer and Makenna's team flew their robotics experiment as part of the Canadian Reduced Gravity Experiment held by SEDS on the National Research Council's Falcon 20 aircraft.

Jennifer (right) and Makenna (left), both recent graduates from the U of A mechanical engineering program, working as mission specialists for **Mission SpaceWalker** during their degree. They are joined by their crewmate Shahruckh (middle) from the National Research Council.

Makenna recently completed a master's of flight test engineering and is now a Flight Test Engineer at Joby Aviation in California.

Jennifer now works at ATCO, where she completed multiple co-op terms during her U of A degree.

This project was made possible because of U of A's **Elko Engineering Garage!**

SEDS members prepared their robots for flight and made their experiment's electroadhesive pads in this makerspace.



Engineering students working in the Elko Engineering Garage.

“

Studying microgravity is essential for space exploration and scientific research, and I am so thankful I was given the opportunity to contribute. Microgravity was the most incredible thing I've ever experienced; it is an incredible feeling!”

JENNIFER

Mechanical engineering co-op graduate, 2024



READY, SET, APPLY!

Engineering offers the opportunity for unlimited creative expression, exploration and innovation. Where others see problems, you see solutions. Are you up for the challenge?

ACADEMIC REQUIREMENTS

Admission to the Faculty of Engineering is competitive; most students enter directly from high school.

Required Alberta Grade 12 courses (or equivalents):

- English 30-1
- Math 30-1
- Math 31 (calculus)
- Chemistry 30
- Physics 30

Transfer admission and processes:

uab.ca/enggy

Programs and admission requirements:

uab.ca/programs

Historical admission averages by faculty:

uab.ca/averages

Apply for scholarships and awards:

uab.ca/awards

University access program for Indigenous students – Transition Year Program:

uab.ca/typ

Important deadlines and to apply: uab.ca/apply

Engineering students Lavanya, Michael and Isabella in the Engineering Incubator. The Engineering Incubator is a space where students, faculty and staff can learn to turn their business ideas into reality.

ASK US

You've got questions
and we've got advisors.
engginfo@ualberta.ca
uab.ca/advising

FOLLOW US



@UAlberta



@UAlberta_Engineering



@UofAEngineering

FIND YOUR PURPOSE

uab.ca/engineering