



UNIVERSITY
OF ALBERTA

ENGINEERING

VIEWBOOK 2024 - 2025



WE ARE

Driven. Curious.
Supportive. Grounded.

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.

Our faculty offers nine fully accredited undergraduate degree programs — ranking us among the top engineering faculties in North America.

Territorial Acknowledgement

The University of Alberta acknowledges that we are located on Treaty 6 territory, and respects the histories, languages, and cultures of First Nations, Métis, Inuit, and all First Peoples of Canada, whose presence continues to enrich our vibrant community.



#2 FOR MINING & MINERAL ENGINEERING AND #10 GLOBALLY

#2 FOR MECHANICAL ENGINEERING

#4 FOR CHEMICAL ENGINEERING

#6 FOR ELECTRICAL & ELECTRONIC ENGINEERING

#6 FOR MATERIALS ENGINEERING

QS World University Rankings

THE FACULTY OF

ENGINEERING

 **THE ONLY**
ACCREDITED PETROLEUM
ENGINEERING SCHOOL IN CANADA

 **\$5.7M**
IN SCHOLARSHIPS
EVERY YEAR

 **\$65M**
IN RESEARCH FUNDING
EVERY YEAR

OUR VISION IS TO BE THE MOST DARING ENGINEERING COMMUNITY ON THE PLANET.

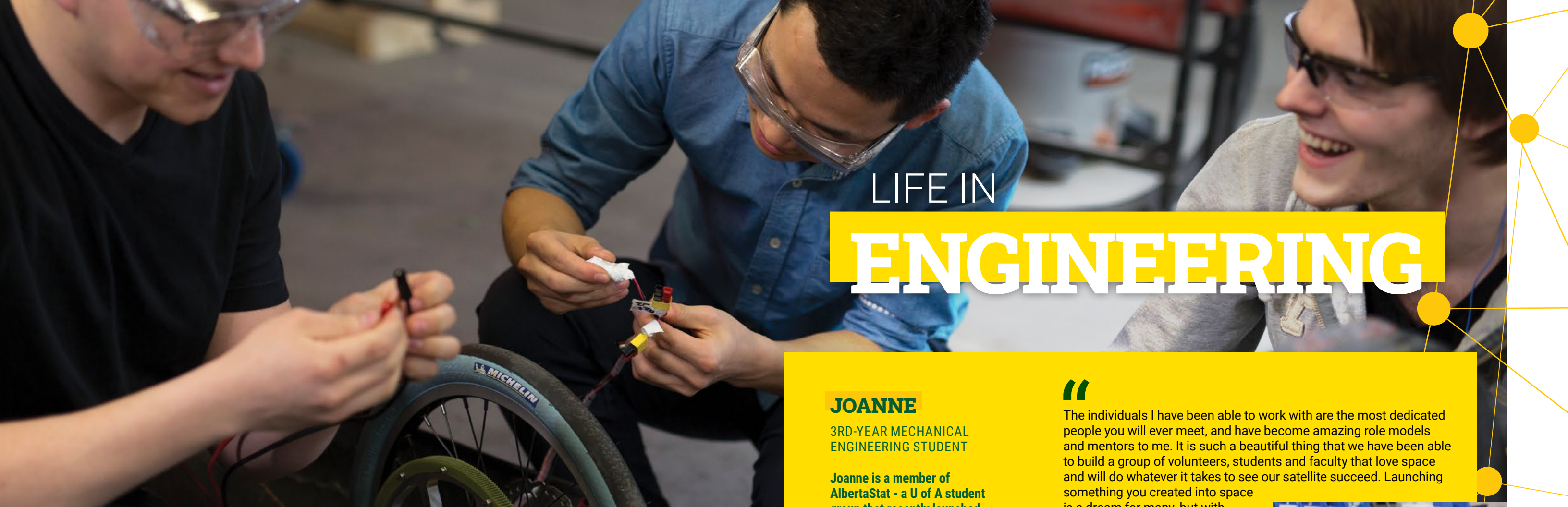
We are united by our unwavering dedication to solving the world's greatest challenges and building a better future for society.

In our faculty, students are put first — they learn inside and outside the classroom surrounded by a highly supportive and robust community.

Your engineering degree from the University of Alberta is your ticket to the world. The education you receive is recognized internationally — and prepares you to work as an engineer absolutely anywhere.

STANDOUTS

- Nine fully accredited undergraduate programs (Engineers Canada)
- Strong, longstanding ties to industry
- One of the oldest and largest co-op programs in Western Canada
- World-renowned reputation for research
- Internationally-recognized professors and facilities
- Our Engineering Career Connections, Experiential Learning, and Co-op teams augment your academics by helping you develop professionally and graduate career-ready



LIFE IN ENGINEERING

ACADEMIC AND WELLNESS SUPPORTS

It's simple – we're here to help you succeed! That's why we encourage you to make the most of our services. 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, tutoring and career resources.

uab.ca/engghelp

ENGINEERING STUDENT SUCCESS CENTRE (ESSC)

In one of our central engineering buildings, first-year engineering students can access free group and one-on-one tutoring to help develop their academic skills and ensure their success.

"The ESSC helped me with chemistry, calculus and physics. Teacher assistants are knowledgeable, and they're able to describe difficult stuff in simple language. This has definitely improved my marks, and the space itself allows you to concentrate better because of the 'working' atmosphere."

— MATVEI

1ST-YEAR ENGINEERING STUDENT

JOANNE

3RD-YEAR MECHANICAL ENGINEERING STUDENT

Joanne is a member of AlbertaStat - a U of A student group that recently launched its second satellite, Ex-Alta 2, into space!

“

The individuals I have been able to work with are the most dedicated people you will ever meet, and have become amazing role models and mentors to me. It is such a beautiful thing that we have been able to build a group of volunteers, students and faculty that love space and will do whatever it takes to see our satellite succeed. Launching something you created into space is a dream for many, but with AlbertaSat we get to turn that dream into a reality and I am so proud to be part of that during my degree at the U of A.”



STUDENT CLUBS AND GROUPS

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. Work on an emissions-free car design or launch a cube satellite into orbit – surprise yourself with our many extracurricular clubs, projects and organizations!

Diversity in Engineering (DivE)

DivE advocates for the retention, inclusion and interests of systematically marginalized groups in engineering to create a supportive environment and make everyone feel welcome.

Innovation, Creativity, and Entrepreneurship (ICE) Engineering Incubator

Interested in entrepreneurship? The ICE Engineering Incubator supports students and alumni pursuing entrepreneurship.

Elko Engineering Garage

You can find this 6,000 square foot workspace on the second floor of the Engineering Teaching and Learning Complex (ETLC). It is home to 3D printers, a virtual reality welding station and automated laser cutters.

Visit uab.ca/engglife to learn more.

FIRST-YEAR ENGINEERING: FOUNDATIONAL YEAR

Your first year is all about creating a solid foundation and introducing you to the vast opportunities available in engineering. Not only will you learn and grow, but you'll also discover how to shape your future career.

First-year classes include engineering's fundamentals – calculus, chemistry, physics, linear algebra, mechanics and computer programming. These classes involve hands-on labs and collaborative seminars, so students can apply their in-class learning.

Students also take two collaborative classes focused on the engineering profession and professional

development. In ENGG 100: Success in Engineering, students learn the skills required to be a successful student and professional engineer, including time management and leadership. ENGG 160: Introduction to Engineering Design, Communication and Profession, teaches fundamental engineering design processes and theory in a multidisciplinary context.

Following the foundational first-year, students pursue a program and choose between the traditional or co-operative (co-op) education routes. Visit uab.ca/BScEngg for more information.



FIRST-YEAR ENGINEERING IN FRENCH: THE CAMPUS SAINT-JEAN COHORT

Campus Saint-Jean, in collaboration with the Faculty of Engineering, allows students to complete their first year of a bachelor of science in engineering (BSc Eng) in French. Students starting at Campus Saint-Jean may enjoy smaller class sizes for first-year courses and more individual support from teachers and professors. Students interested in this stream must meet French Language Proficiency in addition to the academic requirements.

CHEMICAL ENGINEERING



Sure, we can make it... but can we make it better?
This is the mantra of chemical engineers!

OVERVIEW

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 options (traditional or co-op):

- Chemical engineering
- Chemical engineering - computer process control option

Program highlights:

- Our chemical engineering programs focus on fundamental and practical knowledge to prepare students for rewarding careers in diverse industries including sustainable energy and the environment, bioprocessing, biomanufacturing, pharmaceuticals, medicine, data science, machine learning and many others.
- Our computer process control program is unique in North America, as a specialized undergraduate option with wide-reaching industrial applicability.

KEY INDUSTRIES

BIOPROCESSING AND
BIOMANUFACTURING

FOOD PROCESSING

PHARMACEUTICALS

PRODUCT DEVELOPMENT
(PAPER, TEXTILES,
BIOFUELS, ETC.)

RENEWABLE AND
SUSTAINABLE ENERGY

CIVIL ENGINEERING

KEY INDUSTRIES

- [CONSTRUCTION](#)
- [ENVIRONMENTAL](#)
- [GEOTECHNICAL](#)
- [STRUCTURES](#)
- [TRANSPORTATION](#)
- [WATER RESOURCES](#)

Studying civil engineering is about tackling many of today's challenges to build better communities for the future.

OVERVIEW

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 options (traditional or co-op):

- Civil engineering
- Civil engineering - environmental engineering option

Program highlights:

- Our civil engineering program equips students with a broad range of technical knowledge and practical skills in geotechnical, structural, water resources, transportation, environmental and construction engineering.



ENVIRONMENTAL ENGINEERING

Studying environmental engineering is about protecting our environment – and the right time to do that is now!

OVERVIEW

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 options (traditional or co-op):

- Civil engineering - environmental engineering option

KEY INDUSTRIES

- [ENVIRONMENTAL CONSULTING](#)
- [FORESTRY](#)
- [MINING](#)
- [OIL AND GAS](#)
- [PUBLIC HEALTH](#)
- [UTILITIES](#)
- [WASTE MANAGEMENT](#)

COMPUTER ENGINEERING

There's no telling what tomorrow will bring and where computerization will take us, but by studying computer engineering you will help lead the way.

OVERVIEW

Computer engineers play a key role in the design, construction and operation of the computer systems and software that change our lives on a daily basis. When people say "there's an app for that," it's likely attributed to the work of computer engineers.

Program options (traditional or co-op):

- Computer engineering
- Computer engineering - nanoscale system design option
- Computer engineering - software option (co-op only)

Program highlights:

- Your studies will provide you with a broad background in the theory and application of hardware and software technologies, qualifying you for careers ranging from software developer and computer systems designer to electronics circuit and nanoscale system designer. You'll be ready to explore and lead the way in Artificial Intelligence (AI), hardware or software engineering upon graduation.

KEY INDUSTRIES

- [CYBERSECURITY](#)
- [MANUFACTURING](#)
- [MEDICINE](#)
- [TECHNOLOGY](#)
- [TRANSPORTATION](#)

ELECTRICAL ENGINEERING

Studying electrical engineering will help you invent the technology of the future.

OVERVIEW

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 options (traditional or co-op):

- Electrical engineering
- Electrical engineering - nanoengineering option

Program highlights:

- Right now, there are many exciting discoveries at the U of A – renewable energy, 5G and the Internet of Things and electric and autonomous vehicles are just the beginning!

KEY INDUSTRIES

- [DEFENCE](#)
- [ENERGY](#)
- [MANUFACTURING](#)
- [TELECOMMUNICATIONS](#)
- [TRANSPORTATION](#)

ENGINEERING PHYSICS

KEY INDUSTRIES

- CONSUMER ELECTRONICS
- DEFENCE
- ENERGY
- ROBOTICS
- TELECOMMUNICATIONS

Studying engineering physics stems from the mindset that there's always a better way of looking at problems and developing solutions.

OVERVIEW

Engineering physicists tackle big problems on the leading edge of innovation and technology through their solid foundation in electrical engineering and applied physics. Focusing on areas as diverse as applied science, information technology and health and safety, engineering physics help us discover more about ourselves to make breakthroughs in areas including energy and medical robotics.

Program options (traditional or co-op):

- Engineering physics
- Engineering physics - nanoengineering option

Program highlights:

- You'll start with a strong foundation in math and physics and build upon these through active research projects in areas such as fusion energy, microelectronics, robotics systems and fibre-optic communications.

NANOTECHNOLOGY

Studying nanotechnology comes with a fun mindset: if good things come in small packages, even greater things come in even smaller packages!

- Nanotechnology is the study, design and fabrication of materials less than a micrometre (0.000001 metres) in size. New discoveries in nanotechnology have thousands of potential consumer and industrial applications, ranging from the speed of computers to the quality of drinking water in developing and remote communities.

- Did you know our campus is home to the \$52M Nanotechnology Research Facility (nanoFab) that houses the National Research Council-UAlberta Nanotechnology Initiative? NanoFab offers opportunities for you to learn from some of the foremost experts in the world!



MATERIALS ENGINEERING



Studying materials engineering is not just what you build – it's what you build it *with* that matters.

OVERVIEW

Materials engineers study the interrelationships between structure, properties, processing and performance, as well as the characterization of materials. Spatial reasoning skills help in developing, modifying and applying processes for the conversion of raw materials into useful engineering materials with specified desirable properties. They may help make materials lighter, more environmentally friendly and more economically viable.

Program options (traditional or co-op):

- Materials engineering

Program highlights:

- Our materials engineering programs are recognized for excellence in the innovative areas of welding and joining, nanofabrication, mineral processing, biomedical engineering, wear-resistant engineered materials and renewable energy technologies.

KEY INDUSTRIES

- CONSTRUCTION
- DEFENSE
- ELECTRONICS
- HEALTHCARE
- MACHINE MANUFACTURING
- TRANSPORTATION

MECHANICAL ENGINEERING

KEY INDUSTRIES

[DEFENSE](#)
[ENERGY](#)
[HEALTHCARE](#)
[MANUFACTURING](#)
[ROBOTICS](#)
[TRANSPORTATION](#)

From robots to medical devices to industrial systems... if it moves, a mechanical engineer designed it.

OVERVIEW

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 options (traditional or co-op):

- Mechanical engineering
- Mechanical engineering - biomedical option (co-op only)

Program highlights:

- This broad-based program provides you with opportunities to integrate theoretical knowledge with practical, hands-on application and design to push the limits of the physical world.

BIOMEDICAL ENGINEERING

Studying biomedical engineering will not only change your life, but also give you the chance to better the lives of so many others.

By applying engineering principles to medical problems, biomedical engineers improve people's quality of life, and help save lives too!

In collaboration with medical professionals, biomedical engineers design therapeutic systems, software, equipment and devices to advance human health outcomes.

Program options:

- Mechanical engineering - biomedical option (co-op only)

Program highlights:

- The department is housed in two faculties (Engineering and Medicine & Dentistry) and researchers span numerous departments and faculties making it very multidisciplinary.
- Specialize in assistive rehabilitation technologies, human movement biomechanics to cryopreservation and stem cell engineering.

KEY INDUSTRIES

[GOVERNMENT](#)
[HEALTHCARE](#)
[MEDICAL SECTOR](#)
[RESEARCH](#)



MINING ENGINEERING

Mining engineers provide the expertise to acquire clean energy, critical minerals, and other essential resources in a safe, efficient and sustainable manner that honors the rights of all stakeholders.

OVERVIEW

Mining engineers work in a multidisciplinary field that covers every aspect of the responsible extraction of critical minerals, harnessing clean energy fundamental to transforming society and introducing radical change to accelerate a low carbon climate-friendly future. 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 options (traditional or co-op):

- Mining engineering

Program highlights:

- Our mining engineering program is world-renowned. Students can gain practical work experience and earn an income through co-op placements while continuing to study. Our graduates work locally and travel internationally, solving some of the most challenging problems involving critical resources, complex, large-scale operations and thousands of professionals.

KEY INDUSTRIES

[AUTOMATION](#)
[ENERGY](#)
[ENVIRONMENT](#)
[MINING](#)
[RESEARCH](#)

PETROLEUM ENGINEERING

Studying petroleum engineering is about designing processes that will help meet the world's energy demand safely and economically.

OVERVIEW

Petroleum engineers use fundamental scientific knowledge and technology to solve real-life problems, 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 options (traditional or co-op):

- Petroleum engineering

Program highlights:

- We offer the only accredited petroleum engineering degree program in Canada.
- Situated in Canada's primary energy innovation and production region, you'll have an opportunity 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](#)



Why Co-op?

- Gain a competitive edge, with up to 20 months of hands-on training and practical experience prior to graduation.
- Enhance job-ready skills through access to personalized employment supports and program advisors.
- Network with industry leaders and build a personal and professional brand.
- Accelerate learning by putting classroom theory into practice.

CO-OP

OVERVIEW

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 in cultivating talent and preparing students for the demands of an ever-changing global economy. Students learn from industry leaders and make meaningful contributions to their communities. As a co-op student, you will have access to a committed team of professionals all working towards one goal – your success.

The Faculty of Engineering has the second-largest co-operative education program in Western Canada, averaging over 2,200 placements a year with over 95% of our students obtaining a work placement.

ENGINEERING CAREER CONNECTIONS

Recognizing the uniqueness of an engineering degree, we supplement services offered by the University of Alberta Career Centre to give all engineering students (co-op and traditional) a competitive advantage in the job market. Engineering students benefit from programming and resources developed to guide and support them in planning for, finding, and starting impactful careers.

From the beginning of your program you will have access to our Resource Vault, which provides career information designed to help you explore career options and find your summer, co-op, or new grad position. We share information about events and opportunities to help you build a professional network and support your career goals. We also provide free access to VMock, a virtual resume review tool to give you

customized feedback. Discover more at uab.ca/eecnx

Want to learn more about how Engineering Career Connections supports our students in successfully transitioning from the classroom to rewarding careers? Visit uab.ca/eec

EXPERIENTIAL LEARNING, CERTIFICATES & MINORS

Looking to get even more out of your engineering degree? You can 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!

- Opt to add a certificate in sustainability or certificate in innovation and entrepreneurship.
- Engineering students are also eligible to add an optional minor in arts, business or science to their area of study. This requires careful degree planning with an advisor.
- Imagine being involved in leading-edge research for affordable solar energy, or 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, and the Undergraduate Research Initiative.





READY, SET, APPLY!

ACADEMIC REQUIREMENTS

Engineering requires an aptitude for math and science, but also offers the opportunity for unlimited creative expression, exploration and innovation. Where others see problems, confusion and mediocrity, you see solutions, clarity and creativity. Are you up for the challenge?

Most students enter the Faculty of Engineering directly from high school.

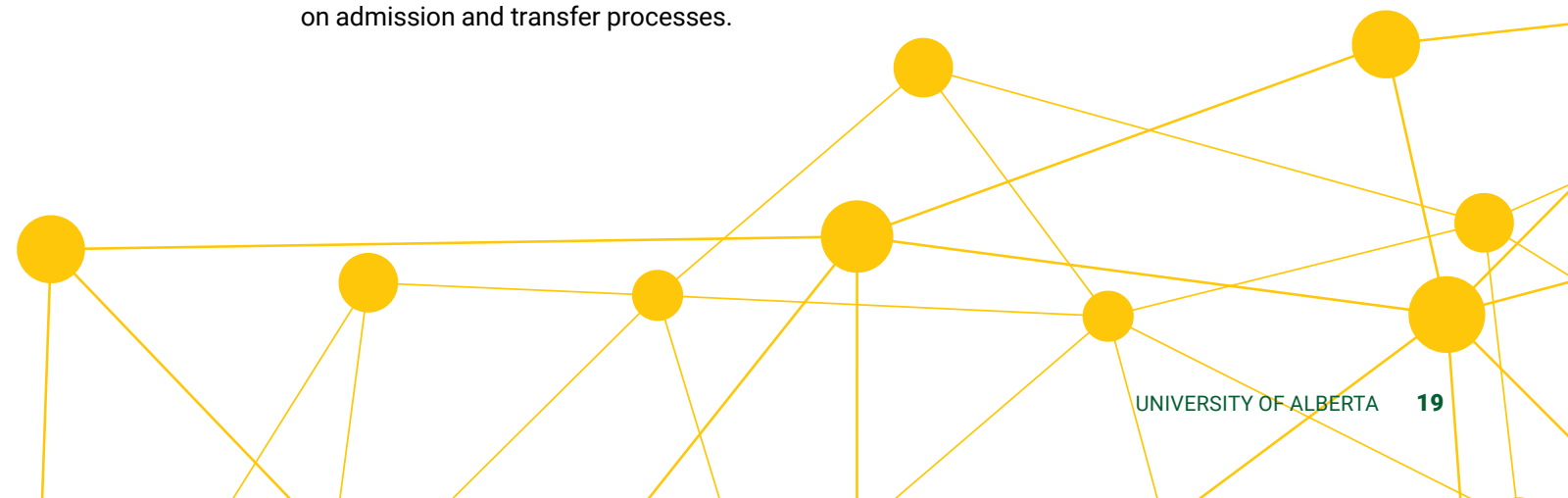
For admission, you must have successfully completed the following five Alberta grade 12 courses or their equivalents:

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

The admission average changes yearly. For historical admission averages by faculty, visit uab.ca/averages

For application deadlines and to apply, visit uab.ca/apply

If you are not applying directly from high school or are applying from outside of Alberta, please visit uab.ca/enggy for more information on admission and transfer processes.





GET AHEAD

Whether you are looking to explore engineering, prepare for your studies or volunteer, there are many ways you can engage with the Faculty of Engineering before joining us on campus.



My favorite part of B2E was definitely getting a little sneak peak into what engineering at the U of A is going to be like and meeting some other new people."

YUKI

3RD-YEAR CIVIL ENGINEERING
CO-OP STUDENT

BRIDGE2ENGG

Bridge2Engg is a pre-university support program designed to proactively help with your transition to engineering at the University of Alberta. The program focuses on connecting you with staff and students, garnering excitement about your program and building an understanding of how to succeed in your first year. Choose from three levels of engagement:

- Level 1 (Foundations) is free to all admitted students and provides introductory support videos, links and documents developed by current students in engineering and a discord server to interact with new students and Bridge2Engg student staff.
- Level 2 (Academic Essentials) provides targeted review content in calculus, physics, chemistry and an introduction to coding.
- Level 3 (ENGG Camp) is a three-week virtual program in August, where you'll collaborate with new and senior engineering students to solve real-world engineering problems, learn more about engineering as a career and the available university supports to help you succeed.

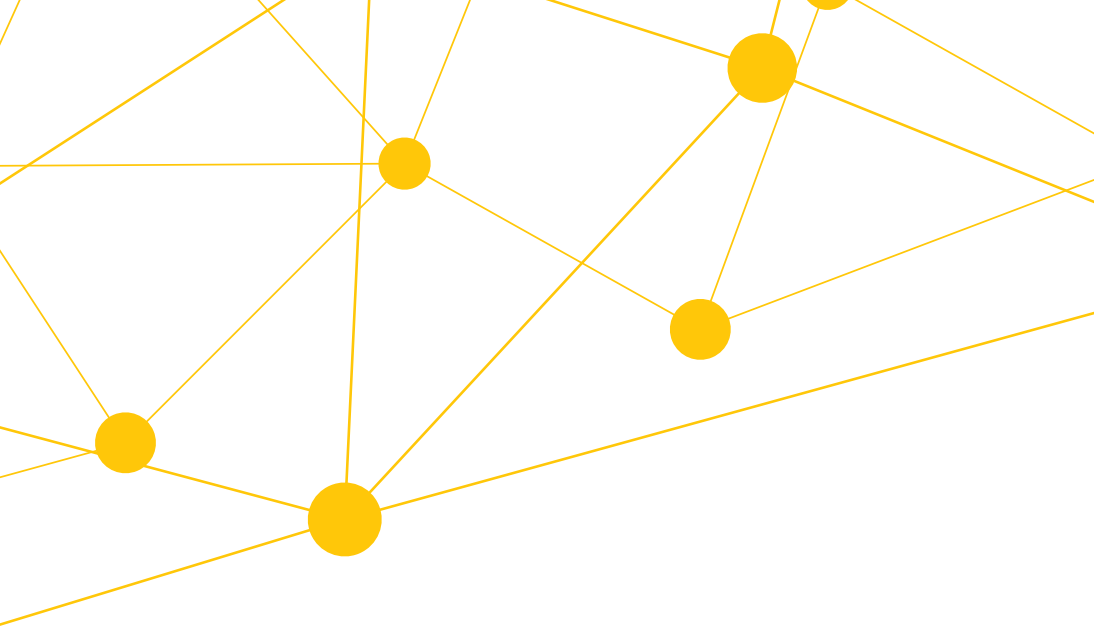
More details are available at uab.ca/b2e or by contacting b2e.info@ualberta.ca

FEM+ ENGINEERING MENTORSHIP PROGRAM

Are you thinking about engineering, but are unsure if it's the right fit? Consider an engineering student mentor! Fem+ is a hybrid seven-month program for high school students who are women, feminine-presenting or identifying, and non-binary, interested in exploring engineering's possibilities! Applications are open until September 30. Visit uab.ca/fem or email femprog@ualberta.ca

JUNIOR INSTRUCTOR WITH DISCOVERE

Are you wrapping up grade 12 and looking for a great summer volunteer opportunity? Get a jump start on your engineering studies with our DiscoverE program. As a junior instructor, you'll be eligible to receive a scholarship for your undergraduate study. You'll also build up your leadership skills and inspire future generations of engineers by sharing your passion and skills! uab.ca/DiscoverE



DELANEY

3RD YEAR CIVIL ENGINEERING

Delaney is a third-year Civil Engineering student and VP External for the Engineering Students' Society. She advocates for and empowers underrepresented groups in STEM through her involvement in UAWISE and FEM+, a Female Engineering Mentorship Program. Delaney ski raced competitively for 13 years growing up and now coaches alpine ski racing to children.

“

My high school music teacher always said, 'The world doesn't need another engineer. The world doesn't really need another anything; so why pursue anything?' The answer lies in humanity. The world doesn't need just another engineer – the world needs an engineer who cares. Over the past three years, I have explored this idea on how I can impact others. I've realized that science and art connect each other, and creativity is essential to STEM. I won't deny that technical training

contributes to being a successful engineer – but, without compassion, we cannot apply that knowledge in a way that enhances the potential of humankind. In a faculty I never thought I would belong in, I have witnessed this sentiment being echoed over and over again. Engineering faculty, staff, and students inspire me every day and have shown me what it means to be a leader. And I believe that is why the world needs another engineer.”

WE
**CAN'T WAIT
TO MEET YOU!**

FIND YOUR **PURPOSE**

uab.ca/engineering

ASK US

You've got questions,
and we've got advisors.

enginfo@ualberta.ca

uab.ca/advising

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**UNIVERSITY
OF ALBERTA**

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