



UNIVERSITY  
OF ALBERTA

# Faculty of Engineering **GRADUATE PROGRAMS**

Embark on a transformative journey with our graduate studies programs, designed to shape the future of aspiring scholars and professionals. A graduate degree opens doors to exciting career advancements, personal growth, increased earning potential, and lasting friendships.

Invest in your future with an MEng, MSc, or PhD from the University of Alberta's Faculty of Engineering. Explore the endless possibilities that await you on this thrilling path.

[ualberta.ca/engineering](https://ualberta.ca/engineering)



# ABOUT US

We are ranked as one of the top universities in the world and one of the top five in Canada. Plus we have one of the highest graduate student funding rates in Canada, on average. We provide engineering students with significant research funding and student financial support, which allows them to dedicate themselves to their studies.

With research and teaching strengths ranging from energy and minerals to climate and the environment to emerging and advanced technologies, we position our students and researchers to uncover the unknown and drive us toward a better world.

The Faculty of Graduate & Postdoctoral Studies and individual departments handle applications for Master's and PhD programs. For individual department contact information, see the last page of this booklet.

Most departments offer three graduate programs:

- Master of Science (MSc)
- Doctor of Philosophy (PhD)
- Course-based Master of Engineering (MEng)

## University of Alberta Rankings

RANKING BODY	WORLD	CANADA
Academic Ranking of World Universities	91	4
Quacquarelli Symonds	96	4
Times Higher Education	109	5





# WELCOME TO EDMONTON

Edmonton is Alberta's capital city and is one of the sunniest cities in Canada with an average of 2,300 hours of sunshine per year. The river valley that winds through the city has more than 160 kilometres of maintained pathways and 20 major parks.

## Housing options

You may choose from many housing options for students, both on campus and around Edmonton. International Student Services has online resources for finding a place to live, including temporary accommodations when you first arrive.

## Exceptional public schools

Our Kindergarten through Grade 12 public school system is one of the best in Canada. According to international testing results, Alberta's public education system ranks second in the world in reading and science and seventh in the world in math.

## Universal healthcare

Alberta Health Services provides health care to all Albertans in hospitals, at the doctor's office, and on the Internet. 811 is a telephone service providing free 24/7 nurse advice and general health information for Albertans.

## Transportation: bus, bike, train

Public transit buses and Light Rail Transit (LRT) connect the city along with well-maintained bike lanes and paths. Maps, schedules and fare info at: [edmonton.ca/edmonton-transit-system-ets](http://edmonton.ca/edmonton-transit-system-ets).

## Community

More than 150 neighbourhood community leagues provide plenty of opportunities to participate in social and recreational activities and get to know your neighbours.

Farmers' markets also offer small agricultural producers the opportunity to sell fresh produce, including meat and vegetables grown in the Edmonton area. The city supports community gardens for those who want to grow their own food but need the space to do it.

# BIOMEDICAL ENGINEERING

The Department of Biomedical Engineering is a joint department between the Faculty of Engineering and Faculty of Medicine & Dentistry.

## **The bridge between Medicine and Engineering**

Biomedical engineering is the application of engineering principles to problems across the biological, medical and health space. Researchers actively apply engineering advances to ultimately improve patient care and overall health outcomes.

## **Home to a dedicated, state-of-the-art MRI facility**

The Peter S. Allen MRI Research Centre is uniquely located within the University Hospital and has two scanners (3T and 4.7T) 100% dedicated to MRI engineering innovation and research.

## **Professors directly affect patient care and industry practice**

The Department of Biomedical Engineering has more than 30 members with primary and cross-appointments from traditional engineering departments and a variety of health sciences departments across campus, including surgery, kinesiology, rehabilitation and others. Our members have expertise in biomechanics, robotics, advanced prosthetics, imaging, sensors and instrumentation, biomaterials, and we apply novel computational methods including AI in our research.

## **RESEARCH AREAS**

- Advanced imaging
- Bioengineering
- Biomechanics
- Bionics
- Nanomedicine
- Precision Health Design

**CONTACT US: [bmeinfo@ualberta.ca](mailto:bmeinfo@ualberta.ca)**







The BME department leaders have supported me in my pursuit of scholarships and travel funding so that I could dedicate myself to research and share my findings at conferences. Overall, I know I made the right choice to pursue a PhD in BME at UofA.

**Heather E. Williams**  
PhD student, BME



My research centers on biomechanics and biomedical engineering, with extensive experience in both experimental and computational biomechanics. I work on vibrations and mechanics, applying my expertise to clinically relevant problems in osseointegration of bone-anchored implants, geometric characterization of anatomical structures, non-invasive diagnosis and monitoring approaches for scoliosis and bone and joint tissue mechanics.

**Lindsey Westover**  
Professor, Biomedical Engineering



# CHEMICAL AND MATERIALS ENGINEERING

Over the course of its 74 year history, the Department of Chemical and Materials Engineering has consistently been internationally recognized for its research, teaching and academic excellence, attracting some of the best and brightest people.

## Home to three major research centres

The Centre for Energy and Mineral Processing Technologies, the Canadian Centre for Welding and Joining, and the Institute for Oil Sands Innovation.

## Home to the Engineering Safety and Risk Management Program

The David and Joan Lynch School of Engineering Safety and Risk Management at the University of Alberta offers the only integrated ESRM program of its kind in Canada.

## Exceptional academics

Our department is home to 4 Tier One and 2 Tier Two Canada Research Chairs, 7 Fellows of the Canadian Academy of Engineering, and 2 Fellows of Royal Society of Canada.

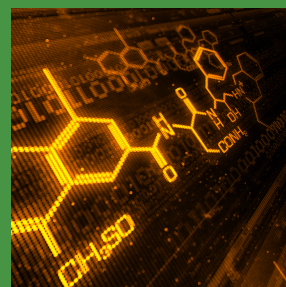
## Partnerships with local companies

Research partnerships mean graduate students can spend extended periods at industrial sites. Industrial participation in graduate training allows graduates to transition seamlessly into industry or entrepreneurial endeavours.

## RESEARCH AREAS

- Reaction engineering and catalysis
- Surface and Interfacial science, thermodynamics, transport phenomena
- Process systems engineering, control, automation, safety & risk management
- Metallic materials and mineral processing
- Advanced nano and functional materials
- Biochemical and biomedical engineering

**CONTACT US:** [chemmat@ualberta.ca](mailto:chemmat@ualberta.ca)





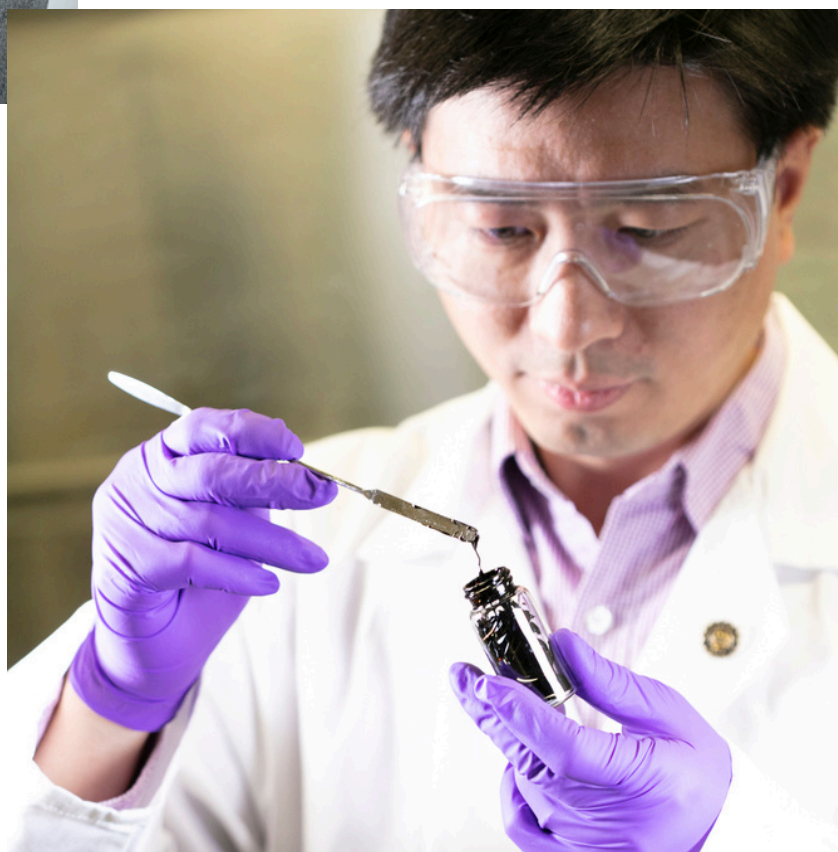


I have had the privilege of working in world-class facilities such as the nanoFAB for my research and have been supported by excellent mentors. This graduate program has given me the opportunity to attend conferences to expand my knowledge and share my work, develop my career through professional development sessions, and gain valuable teaching experience.

**Sophie Shi, PhD student, Materials Engineering**

Through extensive research in colloids, interface science, and molecular interactions, I have gained invaluable insights into physicochemical mechanisms, including applications like froth flotation and water treatment. Eager to share experiences and contribute, I look forward to connecting with fellow engineers to advance innovation and address tomorrow's challenges in chemical engineering and environmental processes.

**Hongbo Zeng, FCAE, FRSC,  
CRC (Tier 1), Professor in Chemical  
and Materials Engineering**





# CIVIL AND ENVIRONMENTAL

## AND THE SCHOOL OF MINING AND PETROLEUM ENGINEERING

The Department of Civil & Environmental Engineering and the School of Mining & Petroleum Engineering offer graduate students some of North America's finest instruction and facilities. Our state-of-the-art research and instructional labs are matched only by our team of professors and researchers, who are recognized as some of the top achievers and scientists in their fields.

### Industrial partnerships to support students

We have built strong relationships with local, national, and international organizations, including PCL Construction, Syncrude Canada, Suncor, Shell, Canadian National Railway, Canadian Pacific Railway, Canadian National Resources, Teck, and British Petroleum.

### World-class research facilities

The Department is home to the Canadian Rail Research Laboratory, Centre for Smart Transportation, Hole School of Construction Engineering, I.F. Morrison Structural Laboratory, Nasser School of Building Science and Engineering, and the GeoInnovation Environments.

### Outstanding academic achievements

Our faculty members include 12 NSERC Industrial Research Chairs, 6 University of Alberta Engineering Research Chairs, 6 Canada Research Chairs, and 10 Endowed or Foundation-supported chairs.

### RESEARCH AREAS

- Construction Engineering and Management
- Environmental Engineering and Science
- Geotechnical and Geoenvironmental Engineering
- Mining Engineering
- Petroleum Engineering
- Structural Engineering
- Transportation Engineering
- Water Resources Engineering
- Cross-disciplinary

**CONTACT US:** [cgradapp@ualberta.ca](mailto:cgradapp@ualberta.ca)





Reflecting on my journey, the University of Alberta stands out as not only a dream institution but also a nurturing ground that has immensely supported and guided my academic and research endeavours. I am incredibly thankful for the opportunity to grow and learn in such a supportive environment.

**Tae Hyun (Calvin) Chung**  
PhD student, Environmental Engineering



Our Department takes pride in its deep-rooted industry ties. We offer our students opportunities to investigate real-world engineering challenges under eight specializations or pursue an interdisciplinary degree tailored to their research interests and career goals.

**Zaher Hashisho**  
Professor, Environmental Engineering



# ELECTRICAL AND COMPUTER ENGINEERING

## Shape the future

Elevate your career with a graduate degree from the Department of Electrical and Computer Engineering. Our graduate students thrive in a dynamic environment, immersed in cutting-edge research and many extracurricular opportunities. Join us in shaping the future of technology and innovation.

## Interdisciplinary innovation

The ECE Department has more than 60 faculty, including 8 IEEE Fellows and 4 Canada Research Chairs. These faculty members engage in interdisciplinary work across engineering, the University, and industry. Additionally, the Department has two industrial professors and two academic teaching staff members.

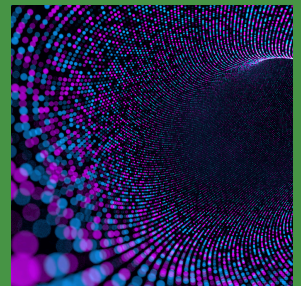
## State-of-the-art learning facilities

Our students have access to state-of-the-art facilities for collaborative research, including nanoFAB: a centralized, open-access research and development facility specializing in micro and nano-scale fabrication and characterization – the largest in Canada.

## RESEARCH AREAS

- Biomedical Engineering
- Communications
- Computer Engineering
- Control Systems
- Electromagnetics and Microwaves
- Energy Systems
- Integrated Circuits and Systems
- Microsystems and Nanodevices
- Photonics and Plasmas
- Signal and Image Processing
- Software Engineering and Intelligent Systems
- Solid State Electronics

**CONTACT US:** [ecegradm@ualberta.ca](mailto:ecegradm@ualberta.ca)







While we may look at further education as a gateway to better opportunities and undeniably, that's true; it's also very important to engage with it for the love of learning and creating and so I consider myself very fortunate to be surrounded by a community that takes pride in that.

**Anoushka Ganguli**  
PhD student,  
Electrical Engineering



My research in the area of biosensing is targeted to improve the life of people with faster detections using bio-wearables, which can introduce quicker interventions and prevent complications. This will help improve the society's health and also reduce the pressure on healthcare. The research in the area of quantum materials will lead to improvement of future devices and electronics including flexible devices.

**Manisha Gupta**  
Professor, Electrical & Computer Engineering



# MECHANICAL ENGINEERING

The Department of Mechanical Engineering at the University of Alberta is among Canada's most productive, recognized, well-funded and reputable Mechanical Engineering departments.

## Offering something to suit everyone

Our students learn in a thriving, dynamic environment rich in research and extracurricular opportunities. We have something for everyone: Robotics and autonomous vehicles, advanced materials and manufacturing, hydrogen production and fuel cells, biomechanics, fluid and solid mechanics, and materials.

## Study in state-of-the-art facilities

Particle synthesis and characterization; high-rate mechanical testing and shock physics setups; cooperative human-robotic platforms; metal and ceramic advanced manufacturing and thermal spraying; and a large specialized wind tunnel.

## Bridging academia and industry

Through research partnerships, graduate students can spend extended periods at industrial sites. This industrial participation in graduate training equips graduates to transition seamlessly into industry or entrepreneurial endeavors.

## RESEARCH AREAS

- Biomechanical, Biomechanics and Human Mechanical Systems
- Design and Manufacturing
- Energy and Environment
- Engineering Management
- Fluid Mechanics
- Mechanical Systems and Controls
- Mechanics and Materials
- Reliability Engineering, Standards, Safety Engineering

**CONTACT US:** [mece@ualberta.ca](mailto:mece@ualberta.ca)







In addition to the valuable opportunity to learn from world-renowned experts in my field of research, the diverse range of projects I've been a part of during my time as a Ph.D student have helped me to grow both personally and professionally.

**Kineshta Pillay, PhD student  
Mechanical Engineering**

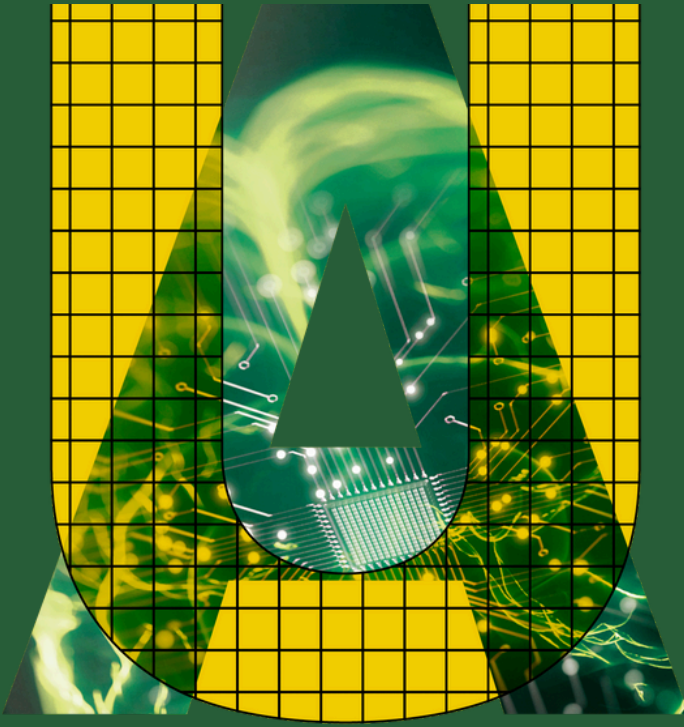


My research is focused on converting natural gas into hydrogen. We investigate how heat, catalysts, and electron beams can break carbon-hydrogen bonds to form hydrogen gas and solid carbon products. This technology has the potential to produce hydrogen with near-zero greenhouse gas emissions.

**Jason S. Olfert  
Professor, Mechanical Engineering**







# HOW TO APPLY

To enrol in graduate studies in engineering, start by contacting the department offering the area of study you are interested in.

Individual departments may have variable application and entry dates and different application procedures. To learn more about an individual department, check out its departmental site.

Department of Biomedical Engineering

[uab.ca/biomed](http://uab.ca/biomed)

Department of Chemical and Materials Engineering

[uab.ca/cme](http://uab.ca/cme)

Department of Civil and Environmental Engineering  
and School of Mining and Petroleum Engineering

[uab.ca/civil](http://uab.ca/civil)

Department of Electrical and Computer Engineering

[uab.ca/eceng](http://uab.ca/eceng)

Department of Mechanical Engineering

[uab.ca/mece](http://uab.ca/mece)

All graduate students are registered in the Faculty of Graduate & Postdoctoral Studies (GPS) regardless of their study area. Visit [uab.ca/graduatestudies](http://uab.ca/graduatestudies) for more information on applying to graduate programs at the University of Alberta.