



**UNIVERSITY
OF ALBERTA**

2023-2024

MASTER OF ENGINEERING

ENVIRONMENTAL ENGINEERING

Students Kia Barrow and Kyra Jubinville sampling on the North Saskatchewan River. Photo: Maricor Arlos

WELCOME TO THE M.ENG. PROGRAM

The University of Alberta's Master of Engineering (M.Eng.) course-based programs are valuable for engineers at any career stage wishing to enhance their technical, managerial, and leadership skills. Our students learn from some of the top academics in their fields and train in internationally renowned facilities. Students participate in practical Alberta-focused projects that prepare them to demonstrate their skills and knowledge to potential employers.

M.Eng. students have access to the University of Alberta's Engineering Employment Center resources (job postings, workshops, networking opportunities, career fairs) and benefit from a dedicated student coach, who provides communications support.

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

M.ENG. PROGRAM INFO

PROGRAM OVERVIEW

Our Environmental Engineering M.Eng. program is designed to equip students with the knowledge and skills to address complex environmental challenges and contribute to sustainable development. The program integrates principles from various disciplines, including engineering and natural sciences – chemistry, biology, and microbiology, to provide a holistic approach to environmental problem-solving. Students will gain expertise in water and wastewater treatment, air pollution control, soil remediation, solid waste management, environmental impact assessment, and sustainable engineering practices.

LEARNING OUTCOMES

- Develop a strong foundation in the core principles of environmental engineering, including the ability to analyze and design engineering systems for water and wastewater treatment, air quality management, soil remediation, and solid waste management.
- Understand and follow national and international environmental regulations, standards, ethical principles and professional responsibilities, and industry trends regarding sustainable development and environmentally friendly practices in engineering design and decision-making.
- Develop strong communication and teamwork skills via capstone projects collaborating with peers from diverse backgrounds to develop comprehensive and integrated engineering solutions to emerging environmental challenges.
- Develop comprehensive skillsets for continuous learning and professional development to stay at the forefront of the ever-evolving environmental engineering industry.





North Saskatchewan River where students go to learn more about contaminant fate and transport.
 Photo: Maricor Arlos

M.ENG. PROPOSED COURSE SEQUENCE

The length of the suggested program is two years. Students can accelerate the program or prolong it after approval from the M.Eng. Academic Advisor.

Please refer to the Graduate Handbook for full program policies.

<p>FALL 2023</p>	<p>CIV E 620 (Environmental Eng Measurements I) CIV E 622 (Phys/Chem Water & Wastewater Treatment) CIV E 789 (Writing/Comm for Engineers)</p>
<p>WINTER 2024</p>	<p>CIV E 623 (Industrial Water & Wastewater Mgmt) CIV E 624 (Biological Waste Treatment Processes) CIV E 628 (Municipal Solid Waste Management)</p>
<p>FALL 2024</p>	<p>CIV E 729 or elective Plus two electives: any 500-, 600- or 700-level Engineering or Science courses within Environmental Engineering and Science or related field, as approved by the MEng Academic Advisor</p>
<p>WINTER 2025</p>	<p>CIV E 900 Capstone project (Directed Research – Environmental section)</p>

STUDENT SUPPORT

GRADUATE PROGRAM ADVISORS

Trina Catral – 7-387 Donadeo ICE
Christina Ezekowitz – 7-381 Donadeo ICE
Arlene Figley – 7-389 Donadeo ICE
Ellie Kim – 7-385 Donadeo ICE

Email: cgradvis@ualberta.ca

ASSOCIATE DEAN GRADUATE STUDENTS CEE/MP

Dr. Zaher Hashisho – 7-241 Donadeo ICE
Email: ad.ceegrad@ualberta.ca

ENVIRONMENTAL GRADUATE COORDINATOR

Dr. Yaman Boluk – 7-273 Donadeo ICE
Email: yaman@ualberta.ca

M.ENG. ACADEMIC ADVISOR

Dr. Yuntong (Amy) She – 7-259 Donadeo ICE
Email: civmeng@ualberta.ca

STUDENT COACHING SERVICES

The Department of Civil and Environmental Engineering is committed to supporting its M.Eng. students as they move through the program.

Students will be provided career and professional development supports throughout their program to aid them in developing their academic and career goals, recognizing and addressing challenges, and building upon their personal strengths to move past their limitations.

Dr. Robyn Braun will support students with their various writing projects and serve as instructor for the communications course. Dr. Braun will also serve as an additional resource and support for students as they navigate the program, the University, and the city of Edmonton.

Contact Dr. Braun at: robyn4@ualberta.ca

WORKING IN CANADA



INTERNATIONAL STUDENT SERVICES

International Student & Visitor Services (ISVS) provides programs, services and events for U of A international students. Their team of licensed immigration consultants and student advisors supports international students with adjusting to living in Edmonton, immigration and additional support to help international students succeed at the U of A.

You can book time with their team of licensed immigration consultants, who can assist you with study permits and extensions, immigration, and working in Canada. Drop-in appointments are available Monday to Friday (1–3 pm) by visiting the International Services Centre (142 Telus Centre) or book an appointment online at: ualberta.ca/international/about-uai/contact-us/international-services-centre

POST GRADUATION WORK PERMIT

The Post-Graduation Work Permit Program (PGWPP) allows students who have graduated from eligible Canadian designated learning institutions (DLIs) to obtain an open work permit to gain valuable Canadian work experience. Our program also provides academic credentials that are recognized by Alberta licensing organization (APEGA) for students with an undergraduate program in a foreign engineering program.

To work in Canada after you graduate, you must apply for a work permit under the Post-Graduation Work Permit Program (PGWPP). Check the [University's ISVS](#) and the [Government of Canada](#) websites for more information about the post-graduation work permit program.

Our program's learning outcomes are inline with Engineers Canada competencies and professional development hours count towards yearly professional requirements.

UNIVERSITY OF ALBERTA RANKINGS

	WORLD	CANADA
ACADEMIC RANKING OF WORLD UNIVERSITIES	91	4
QUACQUARELLI SYMONDS	111	4
TIMES HIGHER EDUCATION	118	6



WELCOME HOME

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

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. Alberta's students rank No. 2 in the world for reading and science and in the top 12 for math.



UNIVERSAL HEALTH CARE

[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.

COMMUNITY

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

Plus farmers' markets offer small agricultural producers the opportunity to sell fresh produce, including meat and vegetables that are 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.



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



INDUSTRY NETWORKING MIXER

Academic knowledge is only part of the equation when preparing students for the workforce. Therefore, we commit to helping our students develop communication skills and professional networks.

In February 2023, the Department of Civil and Environmental Engineering and the School of Mining and Petroleum hosted a networking mixer for our Master of Engineering students. The mixer was part of an ongoing program to support grad students by providing communications training and professional development opportunities.

The mixer, held at the prestigious Royal Glenora Club in Edmonton's River Valley, brought together about 100 grad students and more than a dozen industry representatives for three hours of speakers, professional networking, and delicious food.

Structural engineer at DIALOG and UofA graduate Cam Franchuk gave an inspirational talk reflecting on what he's learned over his 21 years as an engineer. He gave practical advice about lifelong learning and getting your boots muddy, but a recurrent and appropriate overarching theme was the importance of communication. After his presentation, each industry representative came to the podium to introduce themselves, their company, and their work. The last part of the evening was dedicated to mingling and conversation between industry professionals and students.

Our students prepared for the event with a mock mixer training workshop earlier in the week. Dr. Robyn Braun, the Department's Instructor of Communications, and consultants from WorkSpark covered professional dress, conversation starters, handshakes, introducing yourself, and following up after the event.

The mixer and preparation workshop are just part of the support we provide graduate students to help them develop as professional engineers in Canada.



M.Sc. students Aisha Elgarhy, Veronica Wambura, and Syeda Narmeen Zehra at the graduate networking mixer.
Photo: Heather Egger

BENEFITS OF NETWORKING

Career opportunities Networking allows students to connect with potential employers, learn about job opportunities, and gain insights into the engineering profession.

Industry insights By connecting with professionals in their field, students can stay up-to-date with industry news and developments, helping them make informed career decisions.

Mentorship Networking provides students with the opportunity to connect with experienced professionals who can offer guidance and support as they navigate their career path.

Collaboration Working with others can help graduate students develop new skills, gain experience, and expand their engineering knowledge.

Personal development Networking helps students develop essential skills such as communication, teamwork, and interpersonal competence. By attending events, meeting new people, and building relationships, students develop confidence and expand their professional network.

Our department supports students with opportunities to develop professional communication skills and access to career resources.

We support our students in developing effective communication, teamwork, and adaptability through industry networking events, experiential learning opportunities, and professional development.

Through our professional development and communications support team, we help students develop their resumes, practice interviewing skills, and connect with potential employers. We also provide students with access to job fairs, networking events, and other professional development opportunities to help them build relationships and make valuable industry connections.

INSTRUCTOR OF COMMUNICATIONS

Dr. Robyn Braun – 7-240 Donadeo ICE
Email: robyn4@ualberta.ca

WORKSPARK CONSULTING

Professional development workshops in resume writing and networking
Web: workspark.ca

COURSE INFO

CIV E 620 ENVIRONMENTAL ENGINEERING MEASUREMENTS I

COURSE OBJECTIVES

- Introduce the theory and procedures for determining the quality of natural water, potable water, municipal and industrial wastes.
- Introduce the fundamental parameters and concepts for environmental quality evaluation.
- Perform basic experimental analyses for evaluating key parameters in water analysis

LEARNING OUTCOMES

- Demonstrate knowledge of chemical principles and processes of various fundamental environmental phenomena and processes
- Apply basic chemical concepts to analyze chemical processes involved in different environmental problems
- Perform common environmental experiments relating to water and wastewater quality, and know which tests are appropriate for given environmental problems
- Demonstrate the ability to write clear technical laboratory reports

CIV E 622 PHYSICAL/CHEMICAL WATER AND WASTEWATER TREATMENT

COURSE OBJECTIVES

This course is an introduction to the theory and application of the concepts and fundamentals of physical and chemical treatment processes used in the practice of Environmental Engineering. Although the applications will be mainly in the drinking water and municipal wastewater treatment area, the concepts are applicable to many other areas of Environmental Engineering.

LEARNING OUTCOMES

- Fully understand and apply theory behind different physical/chemical methods used in water and wastewater treatment processes;
- Define and describe approaches, unit operations, processes, and equipment used in water and wastewater treatment practice as well as concepts of process and facility design.
- Develop reasonable working knowledge that can be used to design an efficient, cost-effective, multibarrier approach to water treatment; and
- Improve critical thinking and communication skills both in verbal and written format.

COURSE INFO

CIV E 623 INDUSTRIAL WATER AND WASTEWATER MANAGEMENT

COURSE OVERVIEW

Industrial water quantity and quality requirements. Characteristics of wastes, inplant controls, product recovery; effluent characteristics, chemical and toxic properties, pretreatment and treatment design theory and methodology, water reclamation and reuse regulations.



Seth Bumagat from Arlos Lab preparing biota samples for analysis of emerging contaminants.
Photo: Maricor Arlos

COURSE INFO

CIV E 624 BIOLOGICAL WASTE TREATMENT PROCESSES

COURSE OBJECTIVES

The objective of this course is to study the theoretical and applied aspects of biological waste treatment processes in environmental engineering, as well as fundamental knowledge of environmental microbiology that is necessary to understand the biological processes. In order to teach important design calculations, biofilm processes and activated sludge processes, as they are utilized in biological wastewater treatment, will be used as examples to explain load-based design approach and kinetics-based design approach, respectively. A term project will require students to explore on the role of research in advancement of the knowledge and design practice of biological waste treatment processes.

CIV E 628 MUNICIPAL SOLID WASTE MANAGEMENT

COURSE OBJECTIVES

Principles of municipal waste management to protect public health, municipal waste streams, waste stream analysis and prediction. Refuse collection, storage and hauling methods, and facilities. Engineering design and operation of solid waste processing, treatment and disposal methods: resource recovery, recycling programs, incineration, composting, landfilling, and novel techniques. Solid waste legislation and policies. Environment impacts, impact management and facility siting of waste facilities.

LEARNING OUTCOMES

By the end of this course students will be able to:

- Define and explain advanced fundamental and engineering concepts of waste management and treatment concerning composition, properties, treatment or transformation processes.
- Prepare preliminary engineering design calculations related to waste treatment facilities.
- Identify relevant legislation and regulations, future trends in waste management industry, and resource recovery options from various waste streams.
- Make an oral presentation related to waste management and treatment practices, and critically analyze in a written report.

COURSE INFO

CIV E 789 WRITING/COMMUNICATION SKILLS FOR ENGINEERS

COURSE OBJECTIVES

This course introduces M.Eng. students to the development of standard documents used in an engineering career, as well as the fundamentals of technical writing and communication, and of effective professional communication.

LEARNING OUTCOMES

- Communicate effectively and respectfully in diverse settings, in person and via standard business documents, such as email.
- Identify and abide by the rules of plagiarism and academic and professional standards of communication.
- Evaluate their own writing process and institute changes when necessary.
- Solicit and provide actionable feedback on writing and other forms of communication.
- Recognize and produce standards for specific technical documents.
- Research and consider the context, audience, and purpose of their writing projects.
- Write a thesis statement and organize their writing at various levels, from document-level through to sentence structure.
- Identify active and passive voice, and use each appropriately.
- Recognize and evaluate rhetorical devices, strategies, and techniques.

CIV E 900 CAPSTONE DIRECTED RESEARCH PROJECT ENVIRONMENTAL

The Department of Civil and Environmental Engineering offers the Capstone project course to M.Eng. students in the Environmental Engineering stream.

Students will complete directed research projects as part of this course using the knowledge they have gained throughout their undergraduate and graduate programs.

Please see the M.Eng. Academic Advisor for information about the directed research project.