



**UNIVERSITY
OF ALBERTA**

2026-2027

MASTER OF ENGINEERING

WATER RESOURCES ENGINEERING

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 OBJECTIVES

The M.Eng. program is designed to prepare students for engineering practice in modern Water Resources Engineering, involving areas of design, analysis, monitoring, maintenance, and management of water resources systems. It will also equip students with the required knowledge, skills, methods, tools, experience, and professional capability to contribute to the Civil Engineering industry and society at large.

Through this program, students will increase their knowledge, deepen their understanding, and upgrade their skills in subjects fundamental to Water Resources Engineering, enabling them to excel in their field.

LEARNING OUTCOMES

- Gain a comprehensive understanding of the principles, theories, and concepts relevant to water resources engineering, including hydrology, hydraulics, water quality, and water management
- Apply advanced technical skills and tools to analyze, design, and manage water resources systems effectively
- Integrate knowledge from multiple disciplines to develop holistic approaches to water resources management and collaborate effectively with professionals from various fields
- Critically analyze complex water resources engineering problems, evaluate alternative solutions, and make informed decisions considering technical, environmental, social, and economic factors
- Communicate technical information clearly and effectively, both in written reports and oral presentations, to both technical and non-technical audiences
- Prepare for professional practice in water resources engineering or further research by acquiring the necessary knowledge and skills to address real-world challenges and contribute to advancements in the field
- Understand ethical and professional responsibilities and make informed judgements considering the impact of engineering solutions on global, economic, environmental, and societal contexts





North Saskatchewan River
Photo: Chuankang Pei

M.ENG. PROPOSED COURSE SEQUENCE

The length of the program is two years. Students can accelerate the program or prolong it after approval from the M.Eng. Academic Advisor (see program contacts on page 4).

All general electives must be approved by M.Eng. Academic Advisor. Please refer to the Graduate Handbook for full program policies. For more information about graduate courses offered, visit our Grad Program page at <https://civileng-uofa.ca/Grad%20program/>

FALL 2026	CIV E 631 Engineering Fluid Mechanics ¹ CIV E 645 Water Resources Planning and Management ¹ Engg 700 Technical Communication ²
WINTER 2027	CIV E 635 Environmental Fluid Mechanics ¹ CIV E 636 River Ice Engineering ¹ CIV E 739 Open Channel Flow ²
FALL 2027	Three elective courses: any 500-, 600- or 700-level, Engineering or Science courses, as approved by the MEng Academic Advisor ²
WINTER 2028	CIV E 900 Capstone project (Directed Research)

1. Core courses; 2. Discipline-related elective

STUDENT SUPPORT

GRADUATE PROGRAM ADVISORS

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

Email: cgradvis@ualberta.ca

ASSOCIATE DEAN GRADUATE STUDENTS CEE/MP

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

M.ENG. ACADEMIC ADVISOR

Dr. Lijun Deng – 6-261 Donadeo ICE
Email: civmeng@ualberta.ca

WATER RESOURCES GRADUATE COORDINATOR

Dr. Wenming (William) Zhang – 7-271
Donadeo ICE
Email: wenming@ualberta.ca

STUDENT COACHING SERVICES

The Department of Civil and Environmental Engineering and the School of Mining and Petroleum Engineering are committed to fostering the academic and professional success of its M.Eng. students throughout the duration of their program.

To support this goal, students are offered tailored coaching and development services designed to help them clarify academic and career goals, identify and overcome challenges, and build on their personal and professional strengths. Through one-on-one sessions, group workshops, and targeted resources, students are guided in navigating the complexities of graduate studies, enhancing their communication and leadership skills, and preparing for success in the Canadian and global engineering workforce.

These services aim to empower students to take ownership of their academic journey, grow with confidence, and transition effectively into professional roles upon graduation.



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

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, Tuesday, and Friday (9 am -12 pm & 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 in line with Engineers Canada competencies and professional development hours count towards yearly professional requirements.

UNIVERSITY OF ALBERTA RANKINGS

	WORLD	CANADA
ACADEMIC RANKING OF WORLD UNIVERSITIES	101-150	5
QUACQUARELLI SYMONDS	96	4
TIMES HIGHER EDUCATION	116	5



LET'S TALK

SAVE THE DATE:

OUR ANNUAL INDUSTRY MIXER HAS BEEN SCHEDULED FOR FEBRUARY 2ND, 2027.

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.

Since February 2023, the Department of Civil and Environmental Engineering and the School of Mining and Petroleum Engineering at the University of Alberta have hosted an annual networking mixer to support the professional development of Master of Engineering (MEng) students. This initiative is part of a broader program designed to enhance students' communication skills and prepare them for successful careers in engineering.

The three-hour event features guest speakers, professional networking opportunities, and a catered reception. This year, the event will be held in the heart of downtown Edmonton, at the Art Gallery of Alberta.

Distinguished University of Alberta engineering alumni deliver keynote presentations, sharing insights from their professional journeys. Their talks often emphasize practical advice on career growth, lifelong learning, and the value of hands-on experience. A common and compelling theme across all events has been the critical role of effective communication in engineering practice.

To help students maximize the value of this experience, a preparatory networking skills workshop is conducted in advance. This training session covers key topics such as professional attire, networking etiquette, initiating and sustaining conversations, making strong introductions, and post-event follow-up strategies.

Together, the mixer and its preparatory workshop form a vital component of our commitment to supporting graduate students as they develop into well-rounded, professionally prepared engineers in Canada.

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.



Grad students Aisha Elgarhy, Veronica Wambura, and Syeda Narmeen Zehra at the networking mixer.

Photo: Heather Egger

APEGA PROFESSIONAL DEVELOPMENT SERIES

In collaboration with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and the U of A Career Centre, our department offers a series of sessions to equip students with the professional tools, knowledge, and confidence they need to thrive after graduation and successfully transition into professional roles. 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.

A range of workshops are offered (in-person and online) which cover topics including:

- APEGA's Work Readiness Program
- Post-program Insights from a Graduate
- Upgrading your Resume
- Rapid Resume Review
- How to Have a Great Interview
- Mock Interviews
- Intercultural Competency
- Personal Branding
- Leveraging LinkedIn
- Mixer Preparation and Networking skills
- APEGA Requirements for Registration
- Breaking Down Job Postings
- Flourishing in the Workplace

A minimum attendance of 8 distinct sessions (over the duration of the program) is a graduation requirement for MEng students in CEE+MP. Some students may be eligible for an exemption. MEng Students will be automatically enrolled.

PD CREDIT: Students who attend a session AND complete the corresponding mini quiz will receive 1 hr of PD credit (per session). QUIZ + PD Credit component is **OPTIONAL**. The mini quizzes are not part of the graduation requirement.

About the Career Centre

The Career Centre is the source for career and employment information and expertise at the University of Alberta. We strive to empower the talented people of the U of A in developing the skills, knowledge, experiences, and connections they need to confidently manage their careers.

About APEGA

Created on April 10, 1920, the Association of Professional Engineers and Geoscientists of Alberta (APEGA) regulates the practices of engineering and geoscience in Alberta on behalf of the Government of Alberta through the Engineering and Geoscience Professions Act. They are the largest regulator of self-regulated professionals in Western Canada. Their main regulatory function is licensing individuals and companies that want to practise engineering and geoscience in Alberta. Applicants and companies that meet APEGA's standards for ethical, professional, and technical competency earn the right to practise and use reserved titles and designations.

COURSE INFO

CIV E 631 ENGINEERING FLUID MECHANICS

COURSE OBJECTIVES

The primary objective of the course is to significantly increase students' knowledge of engineering fluid mechanics. Students will learn to derive exact solutions to the Navier-Stokes equations and to apply potential flow theory to solve fluid flow problems. They will also acquire a deeper understanding of boundary layer theory, vorticity, and turbulence.

LEARNING OUTCOMES

- Understand the principles of mass, momentum, and energy conservation as they apply to incompressible flows
- Solve inviscid flow problems using potential flow theory and superposition
- Sketch streamlines, pathlines, and streaklines and use these concepts to elucidate flows
- Derive exact solutions to the Navier-Stokes equations for incompressible flows
- Predict the behaviour of turbulent flows using theory and empirical methods

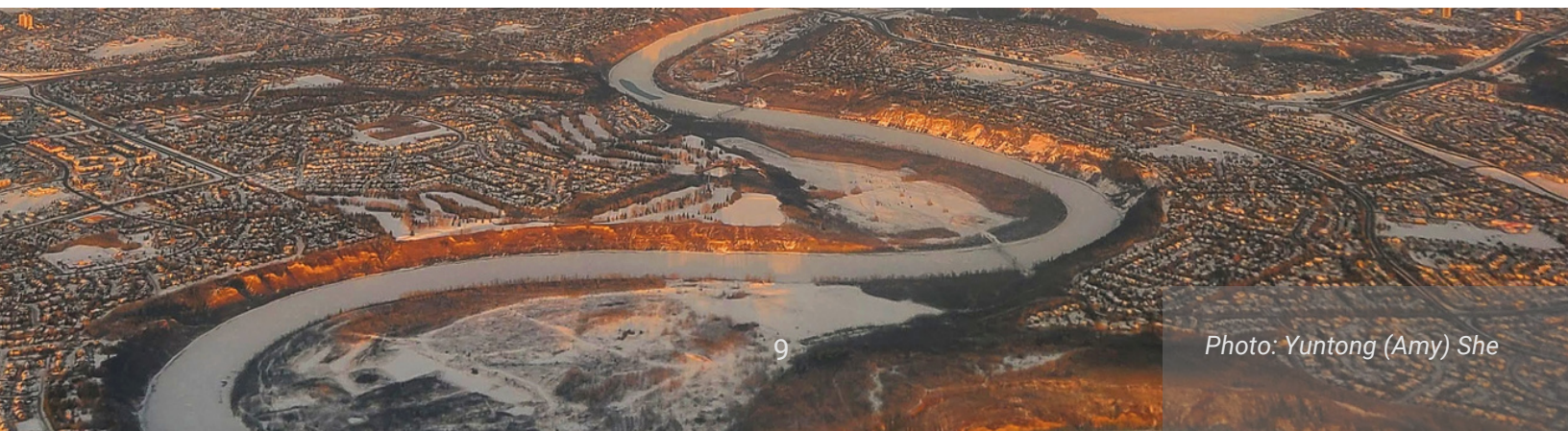
CIV E 635 ENVIRONMENTAL FLUID MECHANICS

COURSE OBJECTIVES

This course studies the transport and mixing (or fate) of pollutants and nutrients in natural and man-made aquatic systems and in atmosphere.

LEARNING OUTCOMES

- Understand the fundamentals in transport and mixing of pollutants and nutrients in natural and man-made aquatic systems and in atmosphere
- Calculate and assess the transport and mixing of pollutants and nutrients in different environments
- Design engineering structures (e.g., diffusers) to minimize environmental impacts of pollutants



Flocculated frazil ice particles produced in our cold room laboratory. The image was captured under cross-polarised light, causing the crystals to appear coloured.

Photo and cover: Vincent McFarlane



CIV E 636 RIVER ICE ENGINEERING

COURSE OBJECTIVES

This course focuses on topics in River Ice Engineering, focusing on the hydraulics and engineering aspects of river ice. It involves a combination of lectures, assigned readings, interactive discussions, and hands-on calculations.

LEARNING OUTCOMES

- Understand various river ice processes during the winter season
- Conduct hydraulic modeling under ice affected conditions
- Obtain knowledge of available techniques for ice jam flood forecasting and mitigation
- Understand the strength characteristics of ice and design for different loading scenarios
- Obtain up-to-date knowledge of the field and identify gaps and potential research areas
- Broaden the view of ice effects in various engineering applications
- Improve technical writing, communication, and presentation skills

COURSE INFO

CIV E 641 ADVANCED SURFACE WATER HYDROLOGY

COURSE OBJECTIVES

The objective of the course is to provide a comprehensive understanding of hydrology and its various components, including the world's water resources, hydrologic processes, atmosphere, hydrosphere, cryosphere, and the impacts of climate change.

LEARNING OUTCOMES

- Understand the world's water resources, the hydrologic cycle, and the various forms of water on Earth
- Comprehend physical hydrologic and atmospheric processes, including the influence of phenomena like ENSO
- Learn about precipitation, evaporation, and their related physical processes and models
- Study soil moisture, infiltration processes, and the cryosphere, including snowpacks, glaciers, and permafrost
- Explore the impacts of climate change on the cryosphere and global sea-level rise
- Gain knowledge of hydrologic applications, modelling techniques, and deterministic hydrologic models like the Sacramento model

CIV E 645 WATER RESOURCES MANAGEMENT AND PLANNING

COURSE OBJECTIVES

The course material applies economics, operations research, management science, systems modeling and analysis, and statistics to water resources problems for the design, analysis, operation, and management of various types of water projects. The tools used are meant for water quantity management. The design and operations of hydro systems are addressed, using operation research techniques such as linear programming, dynamic programming, nonlinear programming, and simulation modelling.

LEARNING OUTCOMES

In the context of water quantity management and operations of hydro systems, the students will

- Learn the fundamentals of economic analysis of water resources projects
- Understand and solve linear programming (LP) problems with the Simplex method, with a focus on water problems
- Understand the basics of dynamic programming
- Understand and solve nonlinear programming (NLP) problems through calculus, line search algorithms, and the generalized reduced gradient approach
- Learn the basics of simulation and the system dynamics methodology
- Apply optimization tools to analyze a water resources problem relevant to Alberta



Photo taken just after the 2019 Ottawa River flood by Yuntong (Amy) She

CIV E 649 NATURAL RESOURCES MANAGEMENT

COURSE OBJECTIVES

The aim of the course is to expose students to complex systems: key systems topics and concepts; system structure and behaviour; and qualitative and quantitative analytical methods for assessing the systemic interactions and behavioural outcomes of alternative management options. Key concepts include sustainability, systems thinking, risk and its management, and life cycles of products and infrastructure. Key methods include system dynamics modelling, risk management, and life cycle assessment.

LEARNING OUTCOMES

- Understand sustainable development and measurement through indicators
- understand systems thinking and system dynamics modelling
- Understand Risk assessment and management
- Have certain knowledge of life-cycle assessment

CIV E 739 ADVANCED TOPICS IN FLUID MECHANICS AND HYDRAULICS - OPEN CHANNEL FLOW

COURSE OBJECTIVES

This course is focused on the principles of open channel flow, including: open channel flow classifications; energy and momentum principles; critical flow; uniform, gradually varied, and rapidly varied flow; unsteady flow; and flood routing. Students will learn the theory required to analyse and solve open channel flow problems, and will gain experience modelling open channel flows using industry standard software.

LEARNING OUTCOMES

- Acquire fundamental knowledge of open channel hydraulics including uniform flow, gradually varied flow, rapidly varied flow, unsteady flow, and flood routing
- Analyse and solve theoretical open channel flow problems
- Understand fundamental open channel flow principles and apply them to solving practical issues
- Understand and apply best practices for modelling open channel flows

COURSE INFO

ENGG 700 TECHNICAL AND PROFESSIONAL COMMUNICATION

COURSE OBJECTIVES

Engineers spend much of their professional lives communicating—working with colleagues, leading teams, negotiating ideas, presenting recommendations, engaging stakeholders, and producing technical documents that inform important decisions. This course develops the communication competencies required for professional engineering practice. Students will explore interpersonal, team, and organizational communication alongside written, visual, and oral communication in engineering contexts. Topics include communication strategies for collaboration and leadership, giving and receiving feedback, conflict management, communicating with diverse audiences, presentations, visual communication, professional identity, ethical and inclusive communication, and the effective use of AI to support engineering communication.

LEARNING OUTCOMES

- Analyze and adapt communication strategies to suit different audiences, occasions, and purposes across interpersonal, organizational, and professional contexts.
- Explain and demonstrate concepts such as impression management, disclosure, perception, listening, conflict resolution, and relational maintenance in diverse interpersonal scenarios.
- Apply communication strategies for professionalism, ethical awareness, boundary setting, and workplace messaging, including email, instant messaging, social media, and internal communications.
- Develop and present engaging, audience-centered speeches using appropriate delivery methods, anxiety management techniques, and verbal and nonverbal strategies.
- Compose resumes and related documents (e.g., cover letters, thank you notes) that reflect audience needs, professional tone, and job-specific language and achievements.
- Write technical and business communication documents (e.g., reports, proposals, instructions) using appropriate formats, tone, style, and structure, while integrating feedback and revision practices.
- Design documents and presentations that combine clear prose with meaningful, ethically constructed visuals to effectively convey data and technical content.
- Demonstrate understanding of rhetorical situation, genre conventions, and audience expectations to shape message content, organization, and tone.
- Participate in group and team projects using appropriate interpersonal and organizational communication strategies, including leadership, feedback, and consensus-building techniques.
- Assess your own communication strengths and challenges, recognize the role of identity and culture in communication, and implement strategies for ongoing personal and professional growth.

COURSE INFO

CIV E 900 CAPSTONE DIRECTED RESEARCH PROJECT **WATER RESOURCES**

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

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

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

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