



**UNIVERSITY
OF ALBERTA**

2026-2027

MASTER OF ENGINEERING

MINING 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 equip students with advanced knowledge, skills, and practical expertise in Mining Engineering. It aims to develop professionals who tackle the industry's complex challenges and emerging trends, particularly in geostatistics, mine design, mine planning, and production scheduling. The program also provides students with the necessary knowledge, skills, tools, and experience to contribute to the mining engineering industry and society.

LEARNING OUTCOMES

- Develop advanced knowledge and skills in mining engineering principles, practices, and technologies to effectively plan, design, and manage mining operations in a safe, efficient, and environmentally sustainable manner
- Implement necessary tools and techniques to analyze complex mining problems using computer-based models, simulations, and data analysis methods
- Collaborate effectively with team members on capstone projects and communicate effectively with team members and other target audiences
- Develop the foundational knowledge and awareness for life-long learning to continue professional growth, thus being adaptable to the ever-evolving industry needs
- Understand ethical and professional responsibilities and make informed judgments considering the impact of engineering solutions in global, economic, environmental, and societal contexts



Students gather in common spaces in Donadeo ICE, where floor-to-ceiling windows overlook the river valley.



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	MIN E 610 Principles of Mining Engineering ¹ MIN E 612 Principles of Geostatistics ² CIV E 680 Engineering Properties of Soils ²
WINTER 2027	MIN E 651 Application of Mine Planning and Design ² Two courses related to Mining Engineering, as approved by MEng Academic Advisor ²
FALL 2027	ENGG 700 Technical Communication ³ One MIN E course ² One elective course: any 500-, 600-, or 700-level Engineering or Science electives, as approved by MEng Academic Advisor ³
WINTER 2028	MIN E 900 Capstone project (Directed Research)

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

MINING GRADUATE COORDINATOR

Dr. Yashar Pourrahimian – 6-243 Donadeo ICE
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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.

CREATIVITY THROUGH COLLABORATION

M.ENG. DESIGN CAPSTONE

The Capstone course encourages teamwork and problem-solving skills, equipping students for success as they transition from academia to industry.

Our Capstone design-build course offers MEng in Structural and Construction Engineering a unique, hands-on learning experience under the guidance of experienced industry professionals. Through this course, students form interdisciplinary teams and engage with real-world challenges that reflect the complexity and dynamics of professional engineering projects.

Throughout the term, students assume roles similar to those of contractors and consultants, navigating technical, logistical, and collaborative aspects of project delivery. The weekly three-hour sessions combine lectures on essential topics—including design thinking, quality and risk management, sustainability, and professional communication—with dedicated time for team collaboration. Emphasis is placed on developing the ability to communicate technical concepts to non-technical audiences, a skill critical to success in the workplace.

For example, in Winter 2024, the final project involved preparing comprehensive proposals for installing a solar array over the iconic Butterdome. This was not a hypothetical assignment—the request for proposals (RFP) was developed in consultation with the University of Alberta’s Project Management Office, presenting a genuine opportunity for students to influence potential implementation on campus. Student feedback underscores the course’s real-world relevance and educational value:

“The guest speakers were especially beneficial. They shared real-world experiences and showcased their projects, which helped us apply these processes to our own projects.”

— Goldy Thevaruparambil Raju

“The collaboration in this course provided a rich learning environment and equipped me with valuable skills in working with construction engineers. It was truly enlightening to witness how our diverse perspectives complemented each other, leading to more comprehensive project outcomes.”

— Belal Abdelbaky Elshal, Structural Engineering

This course exemplifies our commitment to providing MEng students with applied, interdisciplinary learning experiences that prepare them for the challenges and expectations of the engineering profession.



M.Eng. Capstone Class Winter 2024

ADVANTAGES OF CAPSTONE DESIGN COURSE AND WORKING AS A TEAM

- **Diverse Perspectives:** Teams consist of individuals with different backgrounds, skills, and experiences, fostering creativity and innovation through unique viewpoints in problem-solving. Additionally, the course is designed with a well-defined timeline, ensuring everyone stays on track while contributing to the collective goals.
- **Division of Tasks:** Tasks are divided among team members based on their strengths and expertise, increasing efficiency and productivity. With clearly defined expectations and problem formulations, individuals can focus on their areas of strength, leading to better outcomes and effective time management.
- **Support and Collaboration:** Team members provide mutual support, share knowledge, and collaborate, leading to better decision-making and problem-solving as ideas are discussed collectively. The structured timeline and clear milestones further enhance collaboration, ensuring the team progresses cohesively toward the final goal.
- **Learning Opportunities:** Teamwork offers a chance to learn from others through acquiring new skills or understanding different approaches. A clear problem formulation helps guide this learning process, allowing individuals to focus on tackling well-defined challenges efficiently and effectively.
- **Personal Growth:** Working in a team enhances interpersonal skills such as communication, collaboration, and conflict resolution, which are valuable both personally and professionally. Additionally, a well-structured course timeline helps individuals practice and improve time management and goal-setting skills, further contributing to their professional development.

COURSE INFO

MIN E 610 PRINCIPLES OF MINING ENGINEERING

COURSE OBJECTIVES

This course provides students with the knowledge, techniques, principles, and fundamental subjects required for a career as a Mining Engineer. Moreover, the course covers advanced topics in this field.

LEARNING OUTCOMES

- Explain the life cycle of a mine and identify the relationship between mineral resources and ore reserves
- Identify the mining method most appropriate for ore extraction from a given deposit based on consideration of cost and market conditions, ore grades and stripping ratios, access, environmental limitations, and available infrastructure
- Identify and evaluate core risks in each surface and underground mining method
- Determine and select the suitable equipment for each mining method
- Explain and perform different steps of mine planning and scheduling
- Demonstrate awareness of major technological trends





MIN E 612 PRINCIPLES OF GEOSTATISTICS

COURSE OBJECTIVES

Geostatistical methods are presented for characterizing the spatial distribution of regionalized variables, such as ore grades, porosity, permeability, and contaminant concentrations. This class focuses on the geostatistical methodologies for quantifying spatial variability with variograms/covariance functions, estimation with kriging techniques, and stochastic simulation with Gaussian, indicator, and annealing-based methods. Important subjects such as uncertainty quantification, volume-variance relations, and modelling multiple variables will also be addressed. Case studies will be presented from mining, petroleum, and environmental engineering. Students will undertake a variety of theoretical and practical assignments.

LEARNING OUTCOMES

- Understand the importance of geological heterogeneity modeling for resources and reserves
- Describe the sequence of steps required for constructing a fit-for-purpose geostatistical model
- Appreciate how to calculate, interpret and model a variogram for spatial variability quantification
- Implement a kriging estimator for optimal block model estimates
- Explain how uncertainty is a consequence of natural variability and sparse data
- Express how optimal decisions can be made in the presence of geological uncertainty

COURSE INFO

MIN E 613

NON-PARAMETRIC AND MULTIVARIATE GEOSTATISTICS

COURSE OBJECTIVES

Cell-based geology modeling methods include indicator formalism for categorical data and truncated Gaussian simulation. Object-based and process-based approaches for fluvial reservoirs. Indicators for continuous variable estimation and simulation. Multivariate geostatistics, including models of coregionalization, cokriging, Gaussian cosimulation, Markov-Bayes simulation and multivariate data transformation approaches. Introduction to advanced simulation approaches including direct simulation, simulated annealing and multiple point simulation.

LEARNING OUTCOMES

- Understand the importance of categorical variable modeling in mineral resource and mining reserve calculations
- Explain the relevance and procedures for multivariate rock property modeling
- Describe the sequence of steps required for constructing a comprehensive geological, geomechanical and geometallurgical model
- Review the place of different techniques for different purposes

MIN E 614

RISK MANAGEMENT WITH GEOSTATISTICS

COURSE OBJECTIVES

Advanced methods for the modeling of heterogeneity, quantification of uncertainty and management of risk. The theory and place of historical and advanced methods in geostatistics. Matrix methods, alternative variogram measures, kriging with a trend, dual kriging, spectral simulation, direct simulation and multiple point statistics.

LEARNING OUTCOMES

- Achieve a high degree of confidence in advanced geostatistical modeling techniques for risk assessment

COURSE INFO

MIN E 620 ROCK MECHANICS

COURSE OBJECTIVES

The students will learn the latest rock mechanics, blasting and applied geophysics research and field applications supported by fundamentals and practical aspects of rock engineering in mining and civil engineering. Topics ranging from insitu stress measurements, electrical resistivity topography, ground penetrating radar, and learning to contour slopes of surface and underground excavations using blasting will be covered.

LEARNING OUTCOMES

- Develop an advanced understanding of the principles and theories of rock mechanics to analyze and predict the behavior of rock materials under different loading conditions
- Acquire proficiency in conducting laboratory tests and interpreting experimental data to determine the mechanical properties of rocks
- Gain practical skills in numerical modeling techniques and software applications commonly used in rock mechanics
- Explore advanced topics in rock mechanics to develop the ability to apply advanced concepts in practical engineering scenarios
- Explain electrical resistivity topography and ground penetrating radar techniques for subsurface imaging



COURSE INFO

MIN E 630 UNDERGROUND MINING AND BULK MATERIALS HANDLING

COURSE OBJECTIVES

This course is mainly designed to provide students with an in-depth understanding of underground mining methods and associated bulk materials handling methods, covering aspects such as mine layout, design, unit operations, process, specialized equipment, stope stability, and mine safety.

LEARNING OUTCOMES

- Describe and distinguish the concept of various underground mining methods
- Rank underground mining methods and select the most appropriate one according to the economics, style of mineralization, and the rock mass classification
- Design mine stope, pillar, backfill, and blasting in underground mining
- Summarize the characteristics of bulk materials in loading, transport, and storage
- Conduct the design of bins, hoppers, and feeders
- Manage various mine transport methods and solve related technical problems regarding carrying capacity and power consumption

MIN E 641 DISCRETE-EVENT SIMULATION

COURSE OBJECTIVES

Advanced methods for the modeling of heterogeneity, quantification of uncertainty and management of risk. The theory and place of historical and advanced methods in geostatistics. Matrix methods, alternative variogram measures, kriging with a trend, dual kriging, spectral simulation, direct simulation and multiple point statistics.

LEARNING OUTCOMES

- Understand the importance of geological heterogeneity modeling for resources and reserves
- Describe the sequence of steps required for constructing a fit-for-purpose geostatistical model
- Appreciate how to calculate, interpret and model a variogram for spatial variability quantification
- Implement a kriging estimator for optimal block model estimates
- Explain how uncertainty is a consequence of natural variability and sparse data
- Express how optimal decisions can be made in the presence of geological uncertainty

COURSE INFO

MIN E 651 APPLICATION OF MINE PLANNING AND DESIGN

COURSE OBJECTIVES

The course integrates theory and applications by means of undertaking a design project using mine planning software. Emphasis is placed on pit limit optimization, strategic mine planning, short-term planning, and open pit mine design. To complement theory presented in MINE 631, a mine planning and design project with comprehensive instructions and hands-on experience using commercial general mine planning (GMP) software to complete is undertaken.

LEARNING OUTCOMES

- Construct and Analyze Geological Models: Create accurate geological, surface, and solid models from drillhole data, and use these models to make informed decisions in mine planning.
- Implement Block Modeling Techniques: Utilize basic statistical tools and variography to develop and analyze block models, enabling effective resource classification.
- Optimize Open Pit Designs: Perform open pit limit optimization and pushback analysis, integrating production scheduling to achieve optimal mining sequences.
- Design Complex Pit Layouts: Apply practical knowledge in pit design, including the use of polyline tools, ramp and slot design, and waste dump planning, to create efficient mine layouts.
- Evaluate and Optimize Economic Parameters: Use tools such as Whittle for pit design export and scheduling, and apply Lane's theory for cutoff optimization to enhance the economic outcomes of mining operations.

MIN E 661 ADVANCED APPLICATIONS OF SIMULATION AND MODELLING

COURSE OBJECTIVES

The course integrates theory and applications by means of undertaking a real-world simulation project using Arena discrete event simulation software. Emphasis is placed on transporters, customization of simulation using VBA, pseudo agent-based modeling, simulation based optimization, verification and validation techniques, and experimental design. To complement theory presented in MINE 641, a simulation modeling project with comprehensive new theoretical simulation topics are presented.

LEARNING OUTCOMES

- Demonstrate an in-depth understanding of advanced principles and methodologies of discrete event simulation

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

MIN E 900 CAPSTONE DIRECTED RESEARCH PROJECT MINING SECTION

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