



**UNIVERSITY
OF ALBERTA**

2026-2027

MASTER OF ENGINEERING

PETROLEUM 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

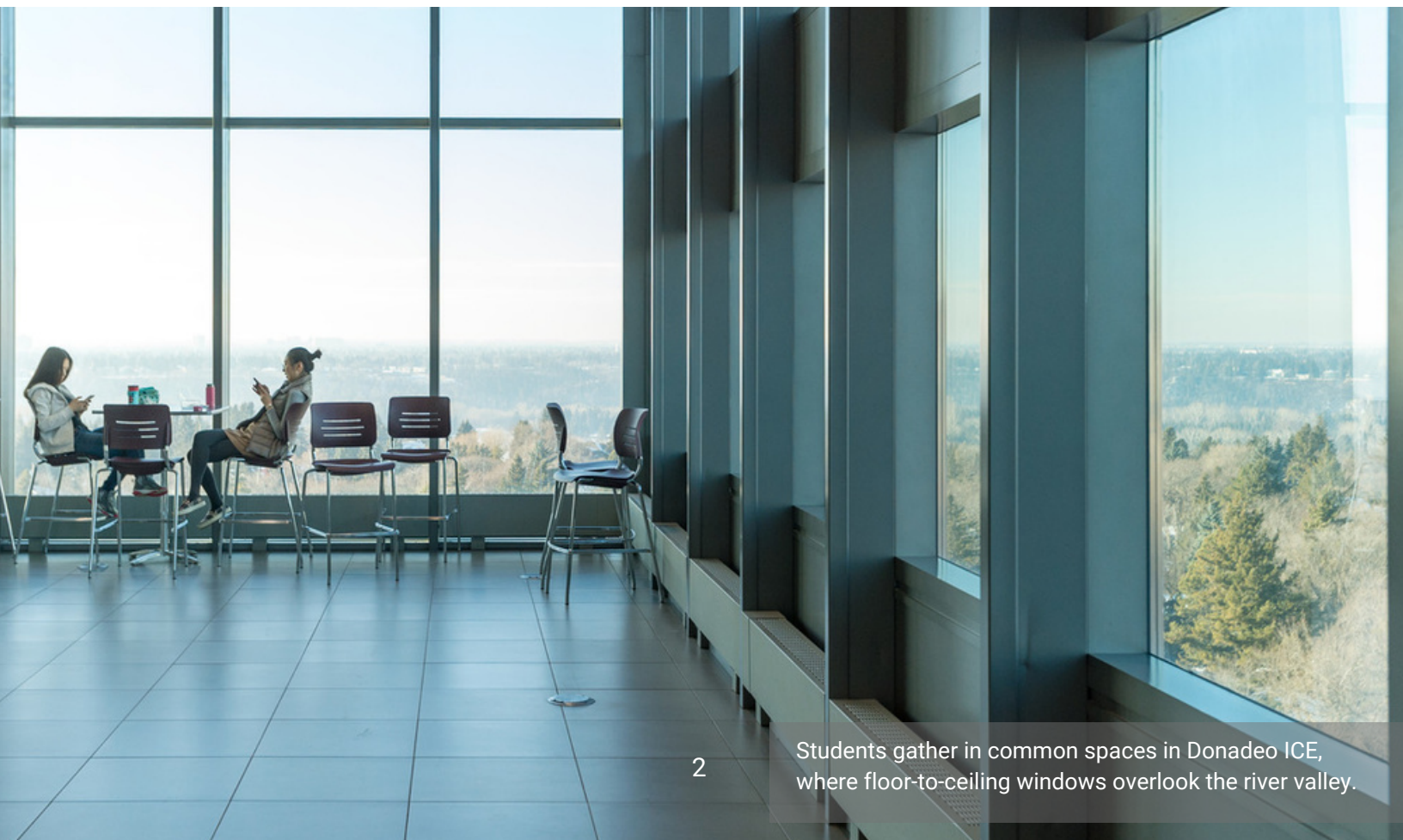
M.ENG. PROGRAM INFO

PROGRAM OBJECTIVES

For over 50 years, the University of Alberta has offered the only accredited BSc Petroleum Engineering degree in Canada. Our program is recognized nationally and internationally for the reputation of our faculty, the quality of our research, and the capabilities of our graduates. Students benefit from the challenges of oil extraction here in Alberta and our close ties with the oil and gas industry. Our research puts M.Eng. students in a position to achieve accelerated career growth because of the richness of their education and the need for Canadian-led expertise around the globe.

LEARNING OUTCOMES

- Explore and develop the oil and gas fields
- Apply the principles of geology, physics, and the engineering sciences to the recovery, development, and processing of petroleum
- Recommend the best location for drilling a well
- Determine if the well contains significant quantities of hydrocarbons that can be recovered economically
- Make decisions regarding appropriate well completion techniques





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	PET E 630 Advanced Reservoir Engineering ¹ PET E 664 Advanced Drilling Engineering ¹ PET E 520 OR PET E 540 ²
WINTER 2027	PET E 631 Advanced Production Engineering ¹ PET E 649 Advanced Reservoir Simulation ¹ One of the following: • PET E 668 Flow Assurance ² • PET E 675 Advanced Petro Eng Thermodynamics ² • PET E 530 Geothermal Energy ²
FALL 2027	Engg 700 Technical Communication ³ One PET E course ² One elective course: any 500-, 600- or 700-level, Science or Engineering course, as approved by the MEng Academic Advisor ³
WINTER 2028	PETE 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

PETROLEUM GRADUATE COORDINATOR

Dr. Nobuo Maeda – 6-245 Donadeo ICE
Email: nobuo@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

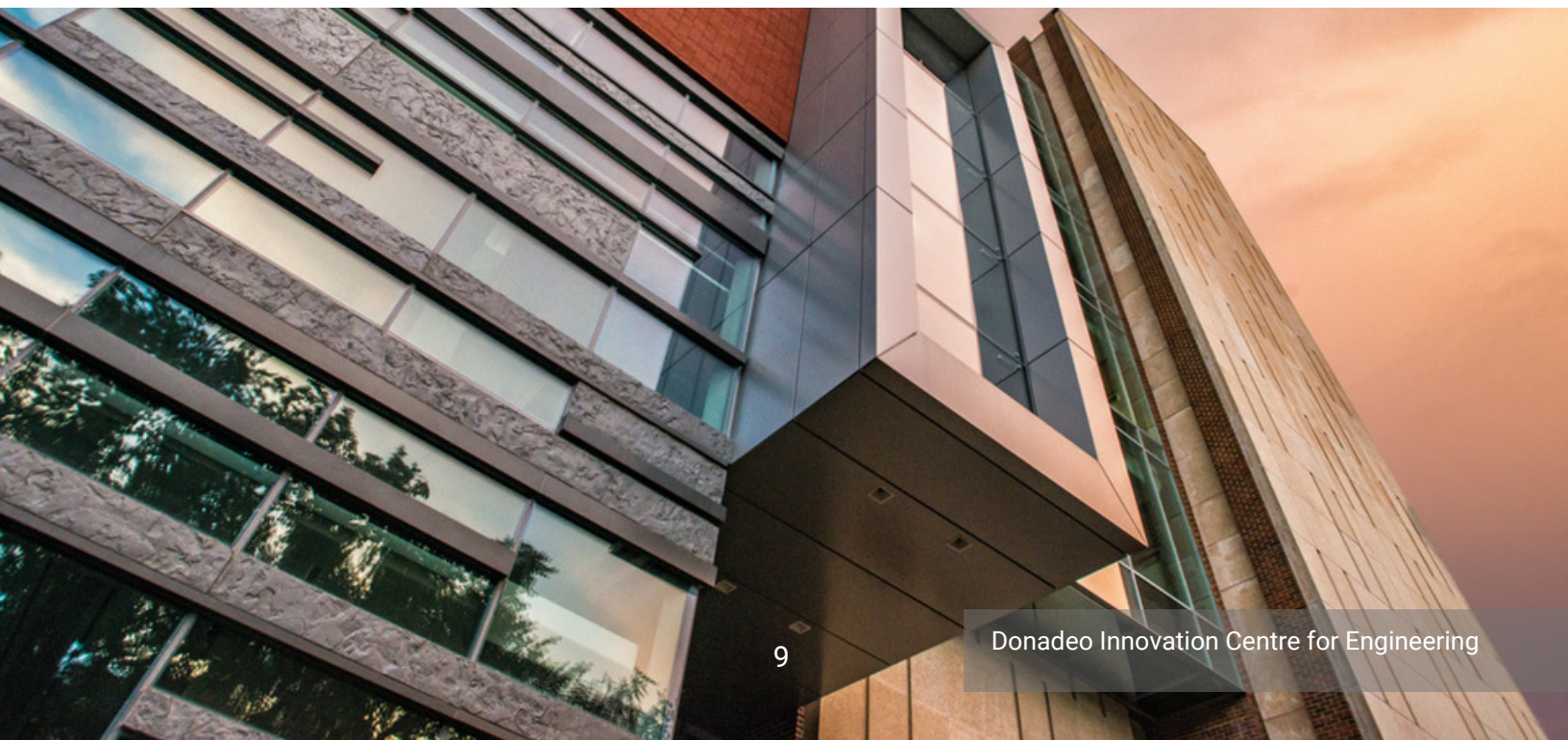
PET E 630 ADVANCED RESERVOIR ENGINEERING

COURSE OBJECTIVES

Single and multiphase flow in porous media: concepts of relative permeability, capillary pressure, and wettability. Immiscible and miscible displacement processes in porous media. Overall reservoir performance (tank model): Mechanics of primary production and material balance equation of gas, gas condensate, volatile and black oil reservoirs. Graphical and analytical decline curve analysis. Diffusivity equation and pressure transient in oil and gas reservoirs.

LEARNING OUTCOMES

- Learning fundamental concepts including interfacial phenomena, wettability, capillary pressure, and relative permeability, and their applications in analyzing reservoir rock-fluid interactions
- Modelling fluid flow in porous media under steady state, pseudo-steady state, and unsteady state conditions
- Streamline modelling for applications such as tracer test, waterflooding, and well-pattern design
- Analyzing well-testing data to estimate reservoir parameters such as permeability, reservoir drainage area and shape, and initial reservoir pressure
- Modelling miscible and immiscible displacement in porous media for different applications such as enhanced oil recovery
- Modeling fluid-flow in fractured reservoirs for application such as production data analysis and forecasting, and reservoir characterization



COURSE INFO

PET E 631 ADVANCED PRODUCTION ENGINEERING

COURSE OBJECTIVES

Inflow performance relationships. Analysis of multiphase flow through pipes and restrictions using flow correlations and mechanistic methods. Flow pattern prediction for vertical, horizontal and inclined pipes. Total system analysis, production optimization. Design of artificial lift systems.

LEARNING OUTCOMES

- Build inflow performance relationships for vertical wells based on field data or correlations
- Build inflow performance relationships for a well producing multiple layers based on field data or correlations
- Carry out pressure traverse calculations along a tubing (vertical or slanted) using empirical or semi-empirical multiphase flow models
- Perform nodal analysis based on vertical lifting performance and inflow performance analysis
- Analyze the effect of operation parameters on the productivity of a given oil well using nodal analysis
- Optimize a well's productivity using nodal analysis

PET E 636 COMPUTATIONAL METHODS FOR TRANSPORT PHENOMENA IN POROUS MEDIA

COURSE OBJECTIVES

Implementation of analytical and numerical techniques for single- or two-phase flow and transport modeling in porous media; Development and formulation of numerical and computer algorithms for flow modeling; Applications in subsurface reservoir simulation is emphasized.

LEARNING OUTCOMES

- Derive basic flow equations and analytical solutions for various scenarios
- Develop and implement finite-difference and finite-volume based solutions to describe single- and two-phase flow problems in 1-D and 2-D with the appropriate boundary and initial conditions
- Develop an understanding in selected special topics in simulation (error propagation, reservoir heterogeneities, streamline simulation, and history matching)

COURSE INFO

PET E 649 ADVANCED RESERVOIR SIMULATION

COURSE OBJECTIVES

Simulation of recovery processes and various EOR methods such as water flooding, chemical flooding and gas flooding; PVT modeling; multiphase flash, compositional and thermal simulation. Modeling naturally fractured reservoirs.

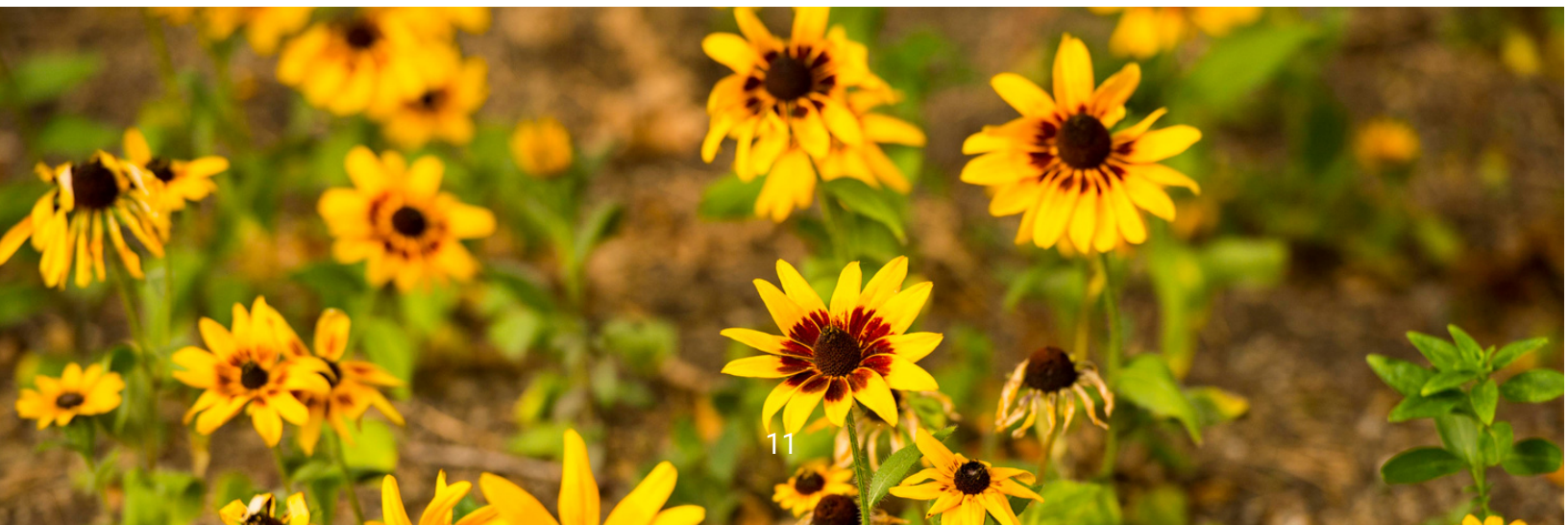
PET E 664 ADVANCED DRILLING ENGINEERING

COURSE OBJECTIVES

Discuss factors controlling drilling cost, introduce concepts for drilling performance evaluation and optimization of drilling operational parameters. Introduce design concepts of drilling directional, horizontal, and multilateral wells. Discuss solutions of the problems encountered in drilling directional, horizontal and multilateral wells. Discuss the design considerations of modern drilling technologies such as, underbalanced drilling, and managed pressure drilling.

LEARNING OUTCOMES

- Learn design concepts behind specific drilling engineering problems and apply knowledge to solve advanced drilling engineering problems (e.g. design of highly inclined, horizontal wells, underbalanced drilling, managed pressure drilling)
- Learn how to prepare safe and cost-efficient drilling programs
- Learn how to design and develop 3-D directional well plans



COURSE INFO

PET E 668 FLOW ASSURANCE

COURSE OBJECTIVES

Overview of flow assurance in oil and natural gas flowlines and pipelines. Fundamentals of surfaces and dispersions, nucleation and crystal growth, multiphase flows. Introduction to fast-forming and slowly-forming flow assurance risk factors; gas hydrates, demulsification, dehydration, wax deposition, asphaltene precipitation, scale formation, sand erosion, pipeline corrosion, sensing and mitigation strategies.

LEARNING OUTCOMES

- Name and describe fast- and slowly- forming flow assurance risk factors in oil and gas pipelines
- Articulate the roles of various types of dispersions that impact the range of flow assurance risk factors in different ways
- Contrast different modes of nucleation and crystal growth of undesirable phases
- Articulate various flow patterns and flow pattern transitions in two-phase flows of liquid and gas and two-phase flows of condensed phases, instabilities that lead to said flow pattern transitions, and modes of accumulation of one phase over the other
- Name and describe the contemporary prevention strategies of each major flow assurance risk factor and articulate the compatibility issues involved
- Name and describe the contemporary remediation strategies



COURSE INFO

PET E 675

ADVANCED PETROLEUM ENGINEERING THERMODYNAMICS

COURSE OBJECTIVES

Thermodynamics and phase equilibrium in pressure-volume-composition relationships in petroleum fluids (oil/gas mixtures). Thermodynamic concepts and laws, phase equilibrium conditions, chemical potentials and fugacity, equilibrium conditions with curved interfaces due to underground capillary effect, phase diagrams of petroleum reservoir fluids, equation of state modelling designed for petroleum fluids, phase equilibrium computations and Tangent-Plane Distance (TPD) analysis, use of PVT software and analysis of petroleum fluid phase behavior and properties.

LEARNING OUTCOMES

- Understand the basic concept of thermodynamics which is the foundation of phase behaviour modelling and other petroleum engineering applications
- Contrast different thermodynamic conditions which are encountered in petroleum engineering
- Understand the confinement effect and its implications in petroleum fluid flow and phase behaviour
- Conduct phase behaviour modelling to obtain petroleum fluid properties at various pressure and temperature conditions
- The knowledge from phase behaviour modelling can be applied to on-field decision-making



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

PET E 900 CAPSTONE DIRECTED RESEARCH PROJECT **PETROLEUM SECTION**

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

NOTES
