Master of Engineering (MEng) in Mechanical Engineering Program: Course Requirements 2024 - 2025

Student Status

Full-time students in the MEng program are normally registered during the Fall and Winter terms (September to April) with a regularly scheduled break during Spring/Summer terms (May to August).

Students will be considered full-time if they enroll in minimum of 2 courses (6 units) per term during each of the Fall and Winter terms.

Academic Standing

B- is the minimum passing grade for students enrolled in graduate programs at the University of Calgary. A student who receives a C+ or lower in any course will normally be required to withdraw from the program.

Students are also required to maintain a minimum Grade Point Average (GPA) of 3.0/4.0, each year. A student whose GPA is lower than 3.0 at the time of their registration anniversary will normally be required to withdraw from the program.

University of Calgary Calendar

Please refer to the University of Calgary Graduate Calendar for more detailed information on program regulations and requirements. The Graduate Calendar is available on-line at University of Calgary: Calendars (ucalgary.ca)

Created: March 2024

Course based MEng programs in the Department of Mechanical and Manufacturing Engineering

There are three pathways available within ŭKŜ MEng program, each of which require completion of 10 courses (30 units):

1. MEng in Mechanical Engineering without any specialization; with three themes.
2. Specialization in Pipeline Engineering
3. Specialization in Energy and Environment

MEng in Mechanical Engineering without Specialization

Theme 1: Mechatronics

YEAR 1					
ENME core	1	required	**ENME 600**	Introduction to Numerical Methods for Engineers	Fall
ENGG core	2	required	**ENGG 687**	Ethics, Law, and the Engineering Profession	Fall
ENME core	3	required	**ENME 646**	Finite Element for Engineers	Fall
Option (1 of 3)	4	option	**ENGG 682**	Sustainability Engineering	Fall
Option (1 of 3)	4	option	**ENGG 684**	Introduction to Project Management	Fall
ENME core	5	required	**ENME 615**	Sensors, Data and Signal Analysis	Winter
Theme 1	6	required	**ENME 641**	Advanced Control Systems	Winter
Option (1 of 3)	4	option	**ENGG 683**	Innovation and Entrepreneurship	Winter
YEAR 2					
ENME core	7	required	**ENME 665**	Advanced Materials Engineering	Fall
Theme 1	8	required	**ENME 661**	Mechatronics Design Laboratory I	Fall
Theme 1	9	required	**ENME 643**	Optimal and Adaptive Control	Winter
Theme 1	10	required	**ENME 662**	Mechatronics Design Laboratory II	Winter

Theme 2: Aerospace and Energy Systems

YEAR 1					
ENME core	1	required	**ENME 600**	Introduction to Numerical Methods for Engineers	Fall
ENME core	2	required	**ENME 646**	Finite Element for Engineers	Fall
Theme 2	3	required	**ENME 670**	Aerodynamics	Fall
Option (1 of 3)	4	option	**ENGG 682**	Sustainability Engineering	Fall
Option (1 of 3)	4	option	**ENGG 684**	Introduction to Project Management	Fall
ENME core	5	required	**ENME 615**	Sensors, Data and Signal Analysis	Winter
Theme 2	6	required	**ENME 637**	Thermal Systems Analysis	Winter
YEAR 2					
ENME core	7	required	**ENME 665**	Advanced Materials Engineering	Fall
ENGG core	8	required	**ENGG 687**	Ethics, Law, and the Engineering Profession	Fall
Theme 2	9	required	**ENME 597**	Turbomachinery	Fall
Option (1 of 3)*	4	option	**ENGG 683**	Innovation and Entrepreneurship	Winter
Theme 2	10	required	**ENEN 619.14**	Alternative Energy Systems	Winter

**Consider choosing this option course to maintain full-time status*

Theme 3: Advanced Manufacturing and Product Design

YEAR 1					
ENME core	1	required	**ENME 600**	Introduction to Numerical Methods for Engineers	Fall
ENGG core	2	required	**ENGG 687**	Ethics, Law, and the Engineering Profession	Fall
ENME core	3	required	**ENME 646**	Finite Element for Engineers	Fall
Option (1 of 2)	4	option	**ENGG 684**	Introduction to Project Management	Fall
ENME core	5	required	**ENME 615**	Sensors, Data and Signal Analysis	Winter
Option (1 of 2)*	4	option	**ENGG 683**	Innovation and Entrepreneurship	Winter
YEAR 2					
ENME core	6	required	**ENME 665**	Advanced Materials Engineering	Fall
Theme 3	7	required	**ENME 614**	Reliability-based Engineering	Fall
Theme 3	8	required	**ENMF 623**	CAD/CAM/CAE	Fall
Theme 3	9	required	**ENMF 673**	Manufacturing of Polymer Composites	Winter
Theme 3	10	required	**ENMF 618**	Manufacturing Optimization	Winter

**Consider choosing this option course to maintain full-time status*

MEng in Mechanical Engineering with Pipeline Engineering Specialization

YEAR 1					
ENME core	1	required	**ENME 634**	Pipeline Geotechnical Engineering	Fall
ENME core	2	required	**ENME 630**	Fundamentals of Liquid Hydraulics in Pipeline Systems	Fall
ENME core	3	required	**ENME 640**	Stress Corrosion Cracking of Materials	Fall
ENME core	4	required	**ENME 622**	Pump and Compressor Stations	Winter
ENME core	5	required	**ENME 626**	Corrosion Science in the Pipelines Industry	Winter
ENME core	6	required	**ENME 624**	Fundamentals of Pipeline Economics	Winter
YEAR 2					
Elective	7	elective	**Elective 1**	Choose an elective course	Fall
Elective	8	elective	**Elective 2**	Choose an elective course	Fall
Elective	9	elective	**Elective 3**	Choose an elective course	Winter
Elective	10	elective	**Elective 4**	Choose an elective course	Winter

Elective courses (choose 4): Students in Pipeline Engineering Specialization can choose any 4 graduate (600 or 700 level) or senior undergraduate (500 level) engineering courses as their elective courses.

MEng pipeline approved courses:

ENME 619.55	Engineering Integrity Management in Pipeline Systems	Not offered in 2024/2025, May be available for 2025/2026
ENME 620	Geomatics Engineering for Pipeline Systems	Not offered in 2024/2025, May be available for 2025/2026
ENME 622	Pump and Compressor Stations	Winter 2025
ENME 624	Fundamentals of Pipeline Economics	Winter 2025
ENME 626	Corrosion Science in the Pipelines Industry	Winter 2025
ENME 628	Pipeline Coatings	Not offered in 2024/2025, May be available for 2025/2026
ENME 630	Fundamentals of Liquid Hydraulics in Pipeline Systems	Fall 2024
ENME 632	Fundamentals of Gas Hydraulics in Pipeline Systems	Not offered in 2024/2025, May be available for 2025/2026
ENME 634	Pipeline Geotechnical Engineering	Fall 2024
ENME 636	Structural Analysis of Buried Steel Pipeline Systems	Not offered in 2024/2025, May be available for 2025/2026
ENME 638	Failure and Fracture Mechanics in the Pipeline Industry	Not offered in 2024/2025, May be available for 2025/2026
ENME 640	Stress Corrosion Cracking of Materials	Fall 2024
ENME 667	Fracture Mechanics	Not offered in 2024/2025, May be available for 2025/2026
ENME 669	Fatigue of Materials	Not offered in 2024/2025, May be available for 2025/2026

MEng in Mechanical Engineering with Energy and Environment Specialization

YEAR 1					
ENME core	1	required	**ENME 600**	Introduction to Numerical Methods for Engineers	Fall
ENGG core	2	required	**ENGG 687**	Ethics, Law and the Engineering Profession	Fall
Option (1 of 2)	3	option	**ENME 646**	Finite Element for Engineers	Fall
Option (1 of 3)	4	option	**ENGG 682**	Sustainability Engineering	Fall
Option (1 of 3)	4	option	**ENGG 684**	Introduction to Project Management	Fall
Option (1 of 3)	4	option	**ENGG 683**	Innovation and Entrepreneurship	Winter
Option (1 of 2)	3	option	**ENME 672**	Computational Fluid Dynamics	Winter
ENME core	5	required	**ENME 615**	Sensors, Data and Signal Analysis	Winter
YEAR 2					
ENME core	6	required	**ENME 665**	Advanced Materials Engineering	Fall
ENEN Core	7	required	**ENEN 671**	Energy and Environment	Fall
ENEN Elective	8	elective	**Elective 1**	Choose an elective course from the list below	Fall
ENEN Elective	9	elective	**Elective 2**	Choose an elective course from the list below	Winter
ENEN Elective	10	elective	**Elective 3**	Choose an elective course from the list below	Winter

Elective courses: Choose 3 ENEN specialization-specific courses.

ENEN 603*	Principles of Environmental Engineering	Fall
ENEN 625	Numerical Methods for Engineers	Fall
ENEN 635	Environmental Modelling	Fall
ENEN 695	Water and Wastewater Pollution, Treatment and Control	Fall
ENEN 697 (ENCH 643)	Air Pollution Mitigation for Environmental Engineers	Fall
ENEN 605*	Environmental Chemistry and Microbiology	Winter
ENEN 619.14	Alternate Energy Systems	Winter
ENEN 621	Experimental Design and Error Analysis	Winter
ENEN 653	Contaminated Soil Remediation	Winter
ENEN 665 (ENCH 665)	Wastewater Issues for the Oil and Gas Industry	Winter
ENEN 693	Life Cycle Assessment	Winter

**Choose either ENEN 603 or ENEN 605. Credit for both these courses will not be granted.*