



Master of Engineering (MEng) in Mechanical Engineering Program Course Requirements 2023-2024

Student Status

Graduate calendar states that students in course-based credentials (i.e., certificates, diplomas, or master's degrees) will be considered full-time if they enroll in 6 units or more per term during each of the Fall and Winter Terms and 3 units or more per term during each of the Spring and Summer Terms.

Full-time students in the MEng (course-based) program are registered during the fall and winter terms (September to April) with a regularly scheduled break during Spring/Summer terms (May to August). To maintain the full-time status, students need to be enrolled in minimum 2 courses (6 Units) per fall and winter terms.

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

There are three pathways available within our MEng program, each of which require completion of 10 courses.

1. MEng in Mechanical Engineering - no specialization (three thematic areas)
2. Specialization in Pipeline Engineering
3. Specialization in Energy and Environment

<https://grad.ucalgary.ca/future-students/explore-programs/mechanical-and-manufacturing-engineering-meng-course>

MEng in Mechanical Engineering without Specilization

Theme 1: Mechatronics

YEAR 1

ENME core	1	required	ENME 631	Numerical Methods for Engineers	Fall
ENGG core	2	required	ENGG 687	Ethics, Law and the Engineering Profession	Fall
Option (1 of 3)	3	option	ENGG 682	Sustainability Engineering	Fall
Option (1 of 3)	3	option	ENGG 684	Introduction to Project Management	Fall
ENME core	4	required	ENME 647	Finite Element Method	Winter
ENME core	5	required	ENME 615	Sensors, Data and Signal Analysis	Winter
Option (1 of 3)	3	option	ENGG 683	Innovation and Entrepreneurship	Winter

YEAR 2

ENME core	6	required	ENME 665	Advanced Materials Engineering	Fall
Theme 1	7	required	ENME 641	Advanced Control Systems	Fall
Theme 1	8	required	ENME 661	Mechatronics Design Laboratory I	Fall
Theme 1	9	required	ENME 650	Mobile Robotics	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 631	Numerical Methods for Engineers	Fall
ENGG core	2	required	ENGG 687	Ethics, Law and the Engineering Profession	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 647	Finite Element Method	Winter
ENME core	6	required	ENME 615	Sensors, Data and Signal Analysis	Winter

YEAR 2

ENME core	7	required	ENME 665	Advanced Materials Engineering	Fall
Theme 2	8	required	ENME 597	Turbomachinery	Fall
Theme 2	9	required	ENME 637	Thermal Systems Analysis	Fall
Option (1 of 3)	4	option	ENGG 683	Innovation and Entrepreneurship	Winter
Theme 2	10	required	ENEN 619.14	Alternative Energy Systems	Winter

Theme 3: Advanced Manufacturing and Product Design

YEAR 1

ENME core	1	required	ENME 631	Numerical Methods for Engineers	Fall
ENGG core	2	required	ENGG 687	Ethics, Law and the Engineering Profession	Fall
Option (1 of 3)	3	option	ENGG 682	Sustainability Engineering	Fall
Option (1 of 3)	3	option	ENGG 684	Introduction to Project Management	Fall
ENME core	4	required	ENME 647	Finite Element Method	Winter
ENME core	5	required	ENME 615	Sensors, Data and Signal Analysis	Winter
Option (1 of 3)	3	option	ENGG 683	Innovation and Entrepreneurship	Winter

YEAR 2

ENME core	6	required	ENME 665	Advanced Materials Engineering	Fall
Theme 3	7	required	ENGG 523	Bio-inspired Design	Fall
Theme 3	8	required	ENMF 623	CAD/CAM/CAE	Fall
Theme 3	9	required	ENMF 619.03	Manufact of Polymer Composites	Winter
Theme 3	10	required	ENMF 618	Manufacturing Optimization	Winter

MEng in Mechanical Engineering with Pipeline Engineering Specialization

YEAR 1

ENME core	1	required	ENME 624	Fundamentals of Pipeline Economics	Fall
ENME core	2	required	ENME 634	Pipeline Geotechnical Engineering	Fall
ENME core	3	required	ENME 667	Fracture Mechanics	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 628	Pipeline Coatings	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): Any graduate-level engineering courses (if chosen course is outside of the Department of Mechanical and Manufacturing, prior approval is required)

Approved courses (choose 6):	ENME 619.55	Engineering Integrity Management in Pipeline Systems	Not offered in 2023/2024, May be available for 2024/2025
	ENME 620	Geomatics Engineering for Pipeline Systems	Not offered in 2023/2024, May be available for 2024/2025
	ENME 622	Pump and Compressor Stations	Winter 2024
	ENME 624	Fundamentals of Pipeline Economics	Fall 2023
	ENME 626	Corrosion Science in the Pipelines Industry	Winter 2024
	ENME 628	Pipeline Coatings	Winter 2024
	ENME 630	Fundamentals of Liquid Hydraulics in Pipeline Systems	Not offered in 2023/2024, May be available for 2024/2025
	ENME 632	Fundamentals of Gas Hydraulics in Pipeline Systems	Not offered in 2023/2024, May be available for 2024/2025

ENME 634	Pipeline Geotechnical Engineering	Fall 2023
ENME 636	Structural Analysis of Buried Steel Pipeline Systems	Not offered in 2023/2024, May be available for 2024/2025
ENME 638	Failure and Fracture Mechanics in the Pipeline Industry	Not offered in 2023/2024, May be available for 2024/2025
ENME 640	Stress Corrosion Cracking of Materials	Not offered in 2023/2024, May be available for 2024/2025
ENME 667	Fracture Mechanics	Fall 2023
ENME 669	Fatigue of Materials	Not offered in 2023/2024, May be available for 2024/2025

MEng in Mechanical Engineering with Energy and Environment Specialization

YEAR 1

ENME core	1	required	ENME 631	Numerical Methods for Engineers	Fall
ENGG core	2	required	ENGG 687	Ethics, Law and the Engineering Profession	Fall
Option (1 of 3)	3	option	ENGG 682	Sustainability Engineering	Fall
Option (1 of 3)	3	option	ENGG 684	Introduction to Project Management	Fall
Option (1 of 3)	3	option	ENGG 683	Innovation and Entrepreneurship	Winter
Option (1 of 2)	4	option	ENME 647	Finite Element Method	Winter
Option (1 of 2)	4	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 Elective	7	elective	Elective 2	Choose an elective course from the below list	Fall
ENEN Elective	8	elective	Elective 1	Choose an elective course from the below list	Fall
ENEN Core	9	required	ENEN 671	Energy and Environment	Winter
ENEN Elective	10	elective	Elective 3	Choose an elective course from the below list	Winter

Electives (choose 3 ENEN specialization-specific courses)

Recommended courses

ENEN 603*	Principles of Environmental Engineering	Fall
ENEN 625	Numerical Methods for Engineers	Fall
ENEN 635	Environmental Modelling	Fall
ENEN 665 (ENCH 665)	Wastewater Issues for the Oil & Gas Industry	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	Alternative Energy Systems	Winter
ENEN 621	Experimental Design and Error Analysis	Winter
ENEN 653	Contaminated Soil Remediation	Winter
ENEN 693	Life Cycle Assessment	Winter

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