SCHULICH School of Engineering

UNIVERSITY OF CALGARY

Master of Engineering (MEng) in Geomatics 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 program in the Department of Geomatics Engineering

Four themes are available within our MEng program, each of which requires completion of 10 courses.

1. Systems for Environmental Monitoring 2. Navigation and Autonomy

3. Digital Imaging Systems 4. Geospatial Intelligent Systems

Students are encouraged to connect with the GPD of Geomatics Engineering to discuss their course selections.

For additional options review the Appendix at the end of this document.

https://grad.ucalgary.ca/future-students/explore-programs/geomatics-engineering-meng-course

MEng in Geomatics Engineering

Theme 1: Systems for Environmental Monitoring

YEAR 1

ENGG core	1	required	**ENGG 680**	Introduction to Digital Engineering	Fall
ENGG core	2	required	**ENGG 684**	Introduction to Project Management	Fall
ENGG core	3	required	**ENGG 683**	Innovation and Entrepreneurship	Winter
Elective	4	elective		Choose a recommended course	Winter
Elective	5	elective		Choose a recommended course	Winter

YEAR 2

ENGG core	6	required	**ENGG 687**	Ethics, Law and the Engineering Profession	Fall
Elective	7	elective		Choose a recommended course	Fall
Elective	8	elective		Choose a recommended course	Fall
Elective	9	elective		Choose a recommended course	Winter
Elective	10	elective		Choose a recommended course	Winter

Recommended courses for Theme 1: Systems for Environmental Monitoring

Supplement with other courses, if required (see Appendix)

Fall term	ENEN 635	Winter term	ENGG 686
Fall term	ENGO 612	Winter term	ENGO 645
Fall term	ENGO 641	Winter term	ENGO 659
Fall term	ENGO 656	Winter term	ENGO 623
Fall term	ENGO 664		

Theme 2: Navigation and Autonomy

YEAR 1

ENGG core	1	required	**ENGG 680**	Introduction to Digital Engineering	Fall
ENGG core	2	required	**ENGG 684**	Introduction to Project Management	Fall
ENGG core	3	required	**ENGG 683**	Innovation and Entrepreneurship	Winter
Elective	4	elective		Choose a recommended course	Winter
Elective	5	elective		Choose a recommended course	Winter

YEAR 2

ENGG core	6	required	**ENGG 687**	Ethics, Law and the Engineering Profession	Fall
Elective	7	elective		Choose a recommended course	Fall
Elective	8	elective		Choose a recommended course	Fall
Elective	9	elective		Choose a recommended course	Winter
Elective	10	elective		Choose a recommended course	Winter

Recommended courses for Theme 2: Navigation and Autonomy

Supplement with other courses, if required (see Appendix)

Fall term	ENGO 625	Winter term	ENGO 623
Fall term	ENGO 641	Winter term	ENGO 651
Fall term	ENGO 664	Winter term	ENGO 659
		Winter term	ENGO 685

Theme 3: Digital Imaging Systems

YEAR 1

ENGG core	1	required	**ENGG 680**	Introduction to Digital Engineering	Fall
ENGG core	2	required	**ENGG 684**	Introduction to Project Management	Fall
ENGG core	3	required	**ENGG 683**	Innovation and Entrepreneurship	Winter
Elective	4	elective		Choose a recommended course	Winter
Elective	5	elective		Choose a recommended course	Winter

YEAR 2

ENGG core	6	required	**ENGG 687**	Ethics, Law and the Engineering Profession	Fall
Elective	7	elective		Choose a recommended course	Fall
Elective	8	elective		Choose a recommended course	Fall
Elective	9	elective		Choose a recommended course	Winter
Elective	10	elective		Choose a recommended course	Winter

Recommended courses for Theme 3: Digital Imaging Systems

Supplement with other courses, if required (see Appendix)

Fall term	ENGO 632	Winter term	ENGG 686
Fall term	ENGO 641	Winter term	ENGO 623
Fall term	ENGO 656	Winter term	ENGO 645
Fall term	ENGO 664	Winter term	ENGO 659

Theme 4: Geospatial Intelligent Systems

YEAR 1

ENGG core	1	required	**ENGG 680**	Introduction to Digital Engineering	Fall
ENGG core	2	required	**ENGG 684**	Introduction to Project Management	Fall
ENGG core	3	required	**ENGG 683**	Innovation and Entrepreneurship	Winter
Elective	4	elective		Choose a recommended course	Winter
Elective	5	elective		Choose a recommended course	Winter

YEAR 2

ENGG core	6	required	**ENGG 687**	Ethics, Law and the Engineering Profession	Fall
Elective	7	elective		Choose a recommended course	Fall
Elective	8	elective		Choose a recommended course	Fall
Elective	9	elective		Choose a recommended course	Winter
Elective	10	elective		Choose a recommended course	Winter

Recommended courses for Theme 4: Geospatial Intelligent Systems

Supplement with other courses, if required (see Appendix)

Fall term	ENEN 635	Winter term	ENGG 686
Fall term	ENGO 603	Winter term	ENGO 605
Fall term	ENGO 641	Winter term	ENGO 645
		Winter term	ENGO 651

APPENDIX - MEng in Geomatics Engineering

1. Course Requirements

In addition to Faculty of Graduate Studies requirements and Schulich School of Engineering, the Department requires: A minimum of 30 units (10 courses), of which at least 24 units (8 courses) must be graduate courses, with no fewer than 12 units (4 courses) of Geomatics Engineering specific graduate courses.
https://www.ucalgary.ca/pubs/calendar/grad/current/engineering-geomatics-engo.html

2. Course Offerings (2023-24)

Take the following 4 courses (required ENGG courses)		
ENGG 680	Introduction to Digital Engineering	Fall
ENGG 684	Introduction to Project Management	Fall
ENGG 687	Ethics, Law, the Engineering Profession	Fall
ENGG 683	Innovation and Entrepreneurship	Winter

Take at least 4 of the following courses (some of these courses may not be offered every academic year)		
ENGO 603	Fundamentals of Infrastructure Asset Management	Fall
ENGO 610	Geospatial Vision	Fall
ENGO 612	Wellbore Positioning by MWD Sensors in the Directional Drilling	Fall
ENGO 625	Advanced GNSS Theory and Applications	Fall
ENGO 632	Advanced Photogrammetric & Ranging Techniques	Fall
ENGO 641	Design & Implementation of GIS	Fall
ENGO 642	Optical Imaging Metrology	Fall
ENGO 656	Hydrographic Surveying	Fall

ENGO 664	Data Analysis in Engineering	Fall
ENEN 635	Environmental Modeling	Fall
ENGO 605	Advanced Topics in Asset Management	Winter
ENGO 623	Inertial Surveying and INS/GPS Integration	Winter
ENGO 645	Spatial Databases and Data Mining	Winter
ENGO 651	Advanced Geospatial Topics	Winter
ENGO 659	Digital Imaging and Applications	Winter
ENGO 685	Wireless Location	Winter
ENGO 697	Directed Studies (Available after the second term of study; supervisor required)	Fall/Winter/Spring/Summer
ENGO 601	Graduate Project (Available after the second term of study; supervisor required)	Fall/Winter/Spring/Summer

Take <u>up to 2</u> of the following courses

Engineering graduate courses

ENGG 682	Sustainability Engineering	Fall
ENGG 681	Engineering Tools	Winter
ENGG 686	Climate Change Adaptation for Engineers	Winter

ENGO undergraduate courses

ENGO 435	Remote Sensing	Fall
ENGO 579	Survey Law and Practice	Fall
ENGO 583	Environmental Modelling (same as ENEN 635)	Fall

ENGO 423	Geodesy	Winter
ENGO 431	Principles of Photogrammetry	Winter
ENGO 455	Land Tenure and Cadastral Systems	Winter
ENGO 465	Satellite Positioning	Winter
ENGO 581	Land Use Planning	Winter

Courses offered by other Departments/Faculties (other courses can also be considered subject to GPD approval)

ENEL 645	Data Mining & Machine Learning	Fall
ENEL 671	Adaptive Signal Processing	Fall
GEOG 680	Principles of Digital Cartography and Geovisualization	Fall
GEOG 682	Fundamentals of Geographic Information Science	Fall
GEOG 684	Fundamentals of Remote Sensing	Fall
GEOG 686	Applied Statistics Geospatial Analysis	Fall
GOPH 671	Inverse Theory and Applications I	Fall
CPSC 615	Computational Techniques for Graphics and Visualization	Winter
GEOG 633	Research and Applications in Remote Sensing	Winter
GEOG 639	Advanced Spatial Analysis and Modelling	Winter
GEOG 647	Advanced Research and Applications in Geographic Information Systems	Winter
GOPH 673	Inverse Theory and Applications II	Winter