

MASTER OF ENGINEERING ENGINEERING MANAGEMENT

Summary

- Degree offered: Master of Engineering (MEng)
- Registration status options: Full-time; Part-time
- Language of instruction: English
- Program option (expected duration of the program):
 - within two years of full-time study
- For immigration purposes, the summer term (May to August) for this program is considered a regularly scheduled break approved by the University. Students should resume full-time studies in September.
- Academic units: Faculty of Engineering (<https://engineering.uottawa.ca/>), Telfer School of Management (<http://www.telfer.uottawa.ca/en/>).

Program Description

The Engineering Management Program offers a Master of Engineering in Engineering Management and a Graduate Diploma in Engineering Management. The program is supervised by a committee composed of representatives from the Telfer School of Management and of the Faculty of Engineering.

Main Areas of Research

- Production and operations management
- Robotics and manufacturing management
- Reliability and maintainability engineering
- Human resource management, industrial and technology marketing
- Technical project management and control
- Research and development and innovation management
- Operation research
- Forecasting

Learning Outcomes

The objective of the Master of Engineering in Engineering Management program is to develop the knowledge and skills of engineers and scientists in the management of people, projects, resources and organizations in technical environments.

Other Programs Offered Within the Same Discipline or in a Related Area

- Graduate Diploma in Engineering Management

Fees and Funding

- Program fees:

The estimated amount for university fees (<https://www.uottawa.ca/university-fees/>) associated with this program are available under the section Finance your studies (<http://www.uottawa.ca/graduate-studies/programs-admission/finance-studies/>).

International students enrolled in a French-language program of study may be eligible for a differential tuition fee exemption

(<https://www.uottawa.ca/university-fees/differential-tuition-fee-exemption/>).

- To learn about possibilities for financing your graduate studies, consult the Awards and financial support (<https://www.uottawa.ca/graduate-studies/students/awards/>) section.

Notes

- Programs are governed by the general regulations (<http://www.uottawa.ca/graduate-studies/students/general-regulations/>) in effect for graduate studies.
- In accordance with the University of Ottawa regulation, students have the right to complete their assignments, examinations, research papers, and theses in French or in English.

Program Contact Information

Graduate Studies Office, Faculty of Engineering (<https://engineering.uottawa.ca/graduate-studies-office/>)
STE 1024
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Ottawa ON Canada
K1N 6N5

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Fax.: 613-562-5129
Email: engineering.grad@uottawa.ca

Twitter | Faculty of Engineering (<https://twitter.com/uOttawaGenie/?lang=en>)

Facebook | Faculty of Engineer (<https://www.facebook.com/uottawa.engineering/>)

Admission Requirements

For the most accurate and up to date information on application deadlines, language tests and other admission requirements, please visit the specific requirements (<https://www.uottawa.ca/graduate-studies/programs-admission/apply/specific-requirements/>) webpage.

To be eligible, candidates must:

- Have a bachelor's degree with a specialization or major in engineering or in science (or equivalent) with a minimum admission average of 70% (B).

Note: International candidates must check the admission equivalencies (<https://www.uottawa.ca/graduate-studies/international/study-uottawa/admission-equivalencies/>) for the diploma they received in their country of origin.

Language Requirements

Applicants must be able to understand and fluently speak the language of instruction (English) in the program to which they are applying. Proof of linguistic proficiency may be required.

Applicants whose first language is neither French nor English must provide proof of proficiency in the language of instruction.

Note: Candidates are responsible for any fees associated with the language tests.

Notes

- The admission requirements listed above are minimum requirements and do not guarantee admission to the program.
- Admissions are governed by the general regulations (<http://www.uottawa.ca/graduate-studies/students/general-regulations/>) in effect for graduate studies.
- Admission to the program is very competitive and preference will be given to candidates who have a few years of full-time work experience in engineering or a related field.

Transfer from the Diploma to the Master's Program

Students registered in the Graduate Diploma in Engineering Management may apply for transfer to the Master of Engineering degree in Engineering Management, obtain advanced standing for courses completed under the Graduate Diploma in Engineering Management, complete the remaining units, and finally obtain the Master of Engineering degree.

Students who have completed the Graduate Diploma in Engineering Management may apply for admission to the Master of Engineering in Engineering Management, obtain advanced standing for courses completed under the Graduate Diploma in Engineering Management, complete the remaining units, and obtain the Master of Engineering degree.

Advanced standing will not be granted for courses completed at other institutions under any circumstances.

Program Requirements Master's with Coursework

Requirements for this program have been modified. Please consult the 2022-2023 calendar (<https://catalogue.uottawa.ca/en/archives/>) for the previous requirements.

To receive the Master of Engineering in Engineering Management, a student enrolled in the program must successfully complete 30 units of academic work: 12 compulsory core course units and 18 optional course units. At least 3 units of optional courses must be from Engineering courses (EMP, GNG) and at least 3 units of optional courses must be from Management courses (ADM, MBA).

Compulsory core courses provide core principles pertaining to the analysis, planning, organization, funding and successful implementation of engineering-focused projects and operations. Mandatory core courses comprise 6 units of engineering-content courses and 6 units of management-content courses.

To receive this Master's degree, a student enrolled in the program must successfully complete 30 course units.

Students must meet the following requirements:

Compulsory Courses:

12 course units from:	12 Units
ADM 6260 Project Management I	
EMP 5100 Introduction to Engineering Management	
EMP 5111 Creativity and Innovation	
EMP 5235 Leadership Skills	
EMP 5241 Management Accounting	

EMP 5250 Introduction to Corporate Finance	
18 optional course units from the list of optional courses	18 Units

Note(s)

List of Optional Courses

Optional courses enable students to develop knowledge and skills in an area of interest. Optional courses must include at least 3 units of engineering (EMP, GNG) courses and at least 3 units of management (ADM, MBA) courses, from the list of optional courses. Although every effort is made towards offering listed optional courses every year, students accepted in the program should verify course availability and plan accordingly. Various other courses are offered on an irregular basis as Special Topics.

It is the student's responsibility to verify that they satisfy the prerequisites and language requirements for the elective courses that they wish to take and, after consultation with the academic advisor, to obtain permission from the professors teaching these courses.

ADM 6261	Project Management II	1.5 Units
ADM 6277	E-Business Energy Management	1.5 Units
ADM 6286	International E-Business Strategies for DTI	1.5 Units
ADM 6287	Business Intelligence Technologies and Big Data Analytics for DTI	1.5 Units
ADM 6420	Digital Marketing	1.5 Units
EMP 5101	Industrial Organization	3 Units
EMP 5102	Systems Engineering and Integration	3 Units
EMP 5103	Reliability, Quality and Safety Engineering	3 Units
EMP 5109	Topics in Engineering Management	3 Units
EMP 5116	Issues in Management and Operation of Communication Networks	3 Units
EMP 5117	Foundations of Software Engineering	3 Units
EMP 5118	Technology Project Management Practice	3 Units
EMP 5119	Project Information Management	3 Units
EMP 5120	Product Development and Management	3 Units
EMP 5121	Taguchi methods for efficient Engineering RD	3 Units
EMP 5122	Operational Excellence and Lean Six Sigma	3 Units
EMP 5169	Advanced Topics in Reliability Engineering	3 Units
EMP 5179	Manufacturing Systems Analysis	3 Units
EMP 5320	Marketing	3 Units
EMP 5330	Managing Talent Organizations	3 Units
EMP 5910	Directed Studies	3 Units
GNG 5120	Technology entrepreneurship for Engineers and Computer Scientists	3 Units
GNG 5123	Enterprise Architecture	3 Units
GNG 5124	Internet Technologies and Mobile Commerce	3 Units
GNG 5125	Data Science Applications	3 Units
GNG 5130	Communication and Influence for Engineers	3 Units
GNG 5131	Sales and Influence for Engineers	3 Units
GNG 5140	Engineering Design	3 Units
GNG 5301	Professional Skills and Responsibility	3 Units
GNG 5300	Topics in Engineering	3 Units
GNG 5310	Topics in Industry Practice	3 Units
GNG 5901	Industry Internship	

GNG 5902	Industry Internship Project	6 Units
MBA 5270	Knowledge and Information Management	1.5 Units

Minimum Requirements

Students who fail 6 units must withdraw from the program.

Research

Research Fields & Facilities

Located in the heart of Canada's capital, a few steps away from Parliament Hill, the University of Ottawa is among Canada's top 10 research universities.

uOttawa focuses research strengths and efforts in four Strategic Areas of Development in Research (SADRs):

- Canada and the World
- Health
- e-Society
- Molecular and Environmental Sciences

With cutting-edge research, our graduate students, researchers and educators strongly influence national and international priorities.

Research at the Faculty of Engineering

Areas of research:

- Chemical and Biological Engineering
- Civil Engineering
- Electrical Engineering and Computer Science
- Mechanical Engineering

For more information, refer to the list of faculty members and their research fields on **Uniweb**.

IMPORTANT: Candidates and students looking for professors to supervise their thesis or research project can also consult the website of the faculty or department (<https://www.uottawa.ca/graduate-studies/students/academic-unit-contact-information/>) of their program of choice. Uniweb does not list all professors authorized to supervise research projects at the University of Ottawa.

Courses

EMP 5100 Introduction to Engineering Management (3 units)

Introduction to management. The structure of engineering organizations. Planning and control in engineering management.

Course Component: Lecture

EMP 5101 Industrial Organization (3 units)

Principles of organization. Production process. Organization and planning of production. Planning and control in engineering management.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5101.

EMP 5102 Systems Engineering and Integration (3 units)

Introduction to modeling methods employed for the planning and design of subsystems and complex systems. System structure and modularity. System-human interfacing. System integration process. Configuration management. Reengineering. Reverse engineering. Concurrent engineering.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5102.

EMP 5103 Reliability, Quality and Safety Engineering (3 units)

Failure rate. Repair time. System reliability estimation. Maintainability. Statistical quality control. Statistical process control. Quality management. Life cycle management. Safety engineering issues.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5103.

EMP 5109 Topics in Engineering Management (3 units)

Current topics in industrial practice

Course Component: Lecture

Corequisite: EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260

EMP 5111 Creativity and Innovation (3 units)

Factors which enhance individual and group creativity in organizations and its translation into successful technological innovations. The invention/innovation process. Creative problem-solving techniques. Entrepreneurship. Organizational climate for stimulating invention. Management of research and development. Project selection. Elements of financial decision-making. Organization design for innovation.

Course Component: Lecture

EMP 5112 Tech. Policy and R. and D. Management (3 units)

Relationship between R & D and economic progress. Elements of the Canadian policy on technology; R & D activities in the private and public sectors; government incentives and support programs; comparison with the policies of other industrial countries. Technology planning and R & D management in a Canadian setting; technology forecasting, staffing, structure, strategy and support for R and D.

Course Component: Lecture

Prerequisite: MBA 5330. Courses EMP 5112, ADM 6263 or ADM 6264 cannot be combined for units.

EMP 5116 Issues in Management and Operation of Communication Networks (3 units)

Selected topics and emerging issues in management and operation of public and corporate communication networks: real-time and distributed systems; multimedia communications; integrated services network.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5116.

EMP 5117 Foundations of Software Engineering (3 units)

Foundations of software engineering for nonsoftware engineers; basic principles of software engineering; practical laboratories and programming examples using modern programming languages.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5117. Experience with programming in at least one common language over the last decade. Cannot count for units in CEG, CSI and SEG programs.

EMP 5118 Technology Project Management Practice (3 units)

Technological project management process. Project team management involving multiple technological and engineering experts. Configuration management during project development. Coordination of outsourcing in large multinational projects. Management of in-process change of technology.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5118.

EMP 5119 Project Information Management (3 units)

Topics relating to the contractual relationship within the project team, including the different types of contracts and their application, the preparation of project documents, the evaluation of different types of project organization structures and associated project delivery systems, bidding strategies, network analysis using deterministic and stochastic methods for time and cost management.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5119.

EMP 5120 Product Development and Management (3 units)

Product development and management, including engineering aspects of the process. The latest trends and practices, insight into processes which facilitate product management and development, understanding of product management and development practices via case studies, development of the leadership and management skills required to create, initiate, develop, bring to market and implement new technological products and services.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5120.

EMP 5121 Taguchi methods for efficient Engineering R&D (3 units)

Two-level statistical experimental methods as applied to engineering design; analysis of means, analysis of variance, contrasts, multifactorial analysis of variance, fractional factorial design, screening designs, product variation and an introduction to the Taguchi approach.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5121.

EMP 5122 Operational Excellence and Lean Six Sigma (3 units)

Lean Six Sigma Green Belt tools and techniques, operational efficiency, waste and variability reduction, continuous improvement, the pursuit of perfection. DMAIC (define, measure, analyze, improve and control), process mapping, data collection and analysis, root cause problem solving, the cost of quality, mistake proofing, change management.

Course Component: Lecture

The courses EMP 5122, GNG 5122 cannot be combined for credits.

EMP 5169 Advanced Topics in Reliability Engineering (3 units)

Overview of classical reliability concepts. Fault tree construction and evaluation. Common cause failure analysis of engineering systems. Human reliability modelling in engineering systems. Human unreliability data banks. Reliability of information and communication systems.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5169.

EMP 5179 Manufacturing Systems Analysis (3 units)

Introduction to manufacturing systems. Manufacturing system selection and cost justification. Analysis of manufacturing operations. Flexible and agile manufacturing. Group technology and cellular manufacturing. Transfer line and assembly line systems. Analysis of material transport and storage systems. Manufacturing Process Planning. Tolerance analysis and Taguchi methods. Design for manufacturing and assembly. Just-in-time production. Quality function deployment.

Course Component: Lecture

EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5179.

EMP 5235 Leadership Skills (1.5 unit)

Power of self-awareness. Exercises for self-exploration. Interpersonal skills. Communication as essential to leadership. Strategies for leadership development. High performing teams and facilitating team process. Course delivery involves class discussions, experiential exercises, guest speakers and case studies.

Course Component: Lecture

The courses EMP 5235, MBA 5235 cannot be combined for units.

EMP 5241 Management Accounting (1.5 unit)

This course focuses on the role of the accounting function internal to the organization. It takes a broad view of managerial accounting, introducing students to various costing systems, cost behaviour patterns and cost structures. It demonstrates the use of accounting for the evaluation of product, managerial and divisional performance thus helping students to understand what accounting can do for decision makers and how accounting choices affect decisions. Emphasis on the strategic importance of aligning accounting systems with firm technologies and goals. Current issues in management accounting and internal reporting are discussed.

Course Component: Lecture

The courses EMP 5241, MBA 5241 cannot be combined for units.

EMP 5250 Introduction to Corporate Finance (1.5 unit)

Financial management and the financial environment. Risk and rates of return. Discounted cash flow analysis. Bond valuation, preferred share, common share and corporate valuation models.

Course Component: Lecture

The courses EMP 5250, MBA 5250 cannot be combined for units.

EMP 5320 Marketing (3 units)

Principles of market-driven managerial decision making: consumer, competitor, and company analysis, market segmentation, definition of target markets, and product positioning. Management of marketing function: product and pricing decisions, channels of distribution, marketing communications. Marketing as creating customer value and benefits to the organization and its stakeholders.

Course Component: Lecture

The courses EMP 5320, MBA 5320 cannot be combined for units.

EMP 5330 Managing Talent & Organizations (3 units)

The strategic advantage of designing effective organizations and talent management systems to achieve organizational outcomes. Topics include: job performance, organizational commitment, thriving workplaces, motivation, and team dynamics. Talent management processes to acquire, develop, and engage employees. Equity, diversity, and inclusion. Organizational culture, power and politics, and current topics related to talent management.

Course Component: Lecture

The courses EMP 5330, MBA 5330 cannot be combined for units.

EMP 5910 Études dirigées / Directed Studies (3 crédits / 3 units)

Étude approfondie dans un domaine de la gestion en ingénierie sous la supervision d'un professeur et donnant lieu à un rapport écrit. / Advanced study in an area of engineering management under the supervision of a professor and leading to a written report.

Volet / Course Component: Recherche / Research

Permission du Département est requise. / Permission of the Department is required.

EMP 6277 E-Business Energy Management (1.5 unit)

Reduction of e-business power requirements by locating data centres in areas with low cost electricity and where cold outside air can be used for cooling, e.g. British Columbia, Québec, Finland, Iceland and Sweden. Reduction of power requirements in other industries, e.g. using smart grid, smart buildings and smart cities. Calculation of energy requirements for specific e-business services, e.g. e-banking, e-newspapers, media download, media streaming and web-based advertising. Review of current international standardization work on sustainability for and by IT.

Course Component: Lecture

The courses ADM 6277, EMP 6277 cannot be combined for units.

EMP 6362 Project Management (3 units)

Introduction to project management. Project life cycle management overview (initiation, planning, execution, monitoring and control, and closure). Basic project management concepts, approaches, methods, tools and techniques. Topics covered include: identifying project needs and objectives; aligning projects with organizational strategy; managing stakeholder expectations; writing the project charter and the project plan; delivering projects; monitoring and control; understanding and measuring project success, delivering long-term and sustainable impacts.

Course Component: Lecture

The courses MBA 6362, EMP 6362 cannot be combined for units.