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
800 King Edward Ave.
Ottawa ON Canada
K1N 6N5
Tel.: 613-562-5347
Fax.: 613-562-5129
Email: engineering.grad@uottawa.ca

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 2019-2020 calendars (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 units of core courses, 12 units of optional courses, and a mandatory 6 units project course comprising applied research work of industrial relevance. 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.

Students must meet the following requirements:

Compulsory Courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADM 6261</td>
<td>Project Management I</td>
<td>1.5</td>
</tr>
<tr>
<td>EMP 5100</td>
<td>Introduction to Engineering Management</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5111</td>
<td>Creativity and Innovation</td>
<td>3</td>
</tr>
<tr>
<td>MBA 5235</td>
<td>Management Skills I</td>
<td>3</td>
</tr>
<tr>
<td>MBA 5241</td>
<td>Managerial Accounting Information and Decisions</td>
<td>3</td>
</tr>
<tr>
<td>MBA 5250</td>
<td>Introduction to Corporate Finance</td>
<td>3</td>
</tr>
</tbody>
</table>

12 course units from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADM 6281</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>ADM 6286</td>
<td>International E-Business Strategies for DTI</td>
<td>3</td>
</tr>
<tr>
<td>ADM 6287</td>
<td>Business Intelligence Technologies and Big Data Analytics for DTI</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5102</td>
<td>Systems Engineering and Integration</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5103</td>
<td>Reliability, Quality and Safety Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5109</td>
<td>Topics in Engineering Management</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5116</td>
<td>Issues in Management and Operation of Communication Networks</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5117</td>
<td>Foundations of Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5118</td>
<td>Technology Project Management Practice</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5119</td>
<td>Project Information Management</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5120</td>
<td>Product Development and Management</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5122</td>
<td>Operational Excellence and Lean Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5169</td>
<td>Advanced Topics in Reliability Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5179</td>
<td>Manufacturing Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5910</td>
<td>Directed Studies</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5120</td>
<td>Technology entrepreneurship for Engineers and Computer Scientists</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5123</td>
<td>Enterprise Architecture</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5124</td>
<td>Internet Technologies and Mobile Commerce</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5125</td>
<td>Data Science Applications</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5130</td>
<td>Communication and Influence for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5131</td>
<td>Sales and Influence for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5140</td>
<td>Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5300</td>
<td>Topics in Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

12 optional course units from the list of optional courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMP 6997</td>
<td>Major Consulting Project</td>
<td>6</td>
</tr>
</tbody>
</table>

Note(s)

1 After completing the 12 units of mandatory compulsory courses and at least 6 units of optional courses, all students must register for the mandatory compulsory capstone 6 units course (EMP 6997) Engineering Management Project, which comprises applied research work of industrial relevance done in teams.

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 theses courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADM 6420</td>
<td>Digital Marketing</td>
<td>1.5</td>
</tr>
<tr>
<td>EMP 5101</td>
<td>Industrial Organization</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5102</td>
<td>Systems Engineering and Integration</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5103</td>
<td>Reliability, Quality and Safety Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5109</td>
<td>Topics in Engineering Management</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5116</td>
<td>Issues in Management and Operation of Communication Networks</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5117</td>
<td>Foundations of Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5118</td>
<td>Technology Project Management Practice</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5119</td>
<td>Project Information Management</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5120</td>
<td>Product Development and Management</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5122</td>
<td>Operational Excellence and Lean Six Sigma</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5169</td>
<td>Advanced Topics in Reliability Engineering</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5179</td>
<td>Manufacturing Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EMP 5910</td>
<td>Directed Studies</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5120</td>
<td>Technology entrepreneurship for Engineers and Computer Scientists</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5123</td>
<td>Enterprise Architecture</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5124</td>
<td>Internet Technologies and Mobile Commerce</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5125</td>
<td>Data Science Applications</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5130</td>
<td>Communication and Influence for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5131</td>
<td>Sales and Influence for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5140</td>
<td>Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>GNG 5300</td>
<td>Topics in Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>
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
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)
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 fo 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 inprocess 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 Planning of Experiments in Engineering Design (3 units)
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)
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)
Course Component: Lecture
EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260 are corequisite to EMP 5179.

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 6997 Projet majeur en consultation / Major Consulting Project (6 crédits / 6 units)
Projet obligatoire de 6 unités réalisé par équipes. Projet majeur de recherche appliquée visant à apporter une solution à un problème de gestion de l’ingénierie proposé par une organisation (compagnie privée, université ou entreprise en démarrage). Supervisé par un professeur, approuvé par le directeur de programme, requiert une proposition de projet, un rapport d’étape de recherche et d’analyse, une présentation finale et un rapport final incluant des recommandations. Noté S (satisfaisant) ou NS (non satisfaisant) par le superviseur et le représentant du client. / Compulsory 6 units team-based major applied research project to address a specific engineering management challenge posed by an organizational client (e.g., private company, university or incubator start-up). Supervised by a professor, approved by the program director, requiring a project proposal, an interim research and analysis report, a final presentation and a final report with recommendations. Graded S (satisfactory) or NS (not satisfactory) by both the supervisor and the client’s representative.
Volet / Course Component: Recherche / Research
Prerequisite: EMP 5100, EMP 5111, MBA 5241, MBA 5250, MBA 5235, ADM 6260, and a further 6 units of program courses.