MASTER OF ENGINEERING MANAGEMENT (ONLINE)

Overview

Summary
• Degree offered: Master of Engineering Management (MEM)
• Registration status options: Part-time
• Language of instruction: English
• Program option (expected duration of the program):
  • within two years of full-time study
• 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 an online Master of Engineering-Management and a Graduate Diploma online 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
• Data analytics
• Production innovation management
• Technology project management
• Operations management
• Robotics and manufacturing

Learning Outcomes
The objective of the Master of 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 Online 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 academic 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.
Development in Research (SADRs):

uOttawa focuses research strengths and efforts in four Strategic Areas of research universities.

Parliament Hill, the University of Ottawa is among Canada's top 10 research universities. 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
- 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

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):

- Chemical and Biological Engineering
- Civil Engineering
- Electrical Engineering and Computer Science
- Mechanical Engineering
- Canada and the World
- Health
- e-Society
- Molecular and Environmental Sciences

Program Requirements

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

Master's with Coursework

To receive the Master of Engineering Management, a student enrolled in the program must successfully complete 30 units of academic work: 12 units of compulsory courses and 18 units of optional courses.

Students must meet the following requirements:

Compulsory Courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>MEM 5100</td>
<td>Introduction to Engineering Management</td>
<td>3</td>
</tr>
<tr>
<td>MEM 5241</td>
<td>Principles of Accounting and Finance for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>MEM 5231</td>
<td>Principles of Management and Leadership for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>MEM 6260</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>18 optional course units from the list of optional courses</td>
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List of optional courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>DTO 6106</td>
<td>User Research and User Experience Principles and Practice</td>
<td>3</td>
</tr>
<tr>
<td>DTO 6107</td>
<td>Interaction Design and Design Thinking</td>
<td>3</td>
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<tr>
<td>MEM 5111</td>
<td>Creativity and Innovation</td>
<td>3</td>
</tr>
<tr>
<td>MEM 5119</td>
<td>Project Information Management</td>
<td>3</td>
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<tr>
<td>MEM 5120</td>
<td>Product Development and Management</td>
<td>3</td>
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<tr>
<td>MEM 5121</td>
<td>Taguchi Methods for Engineering R D</td>
<td>3</td>
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<tr>
<td>MEM 5122</td>
<td>Operational Excellence and Lean Six Sigma</td>
<td>3</td>
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<tr>
<td>MEM 5265</td>
<td>Business Intelligence and Performance Management</td>
<td>3</td>
</tr>
<tr>
<td>MEM 5280</td>
<td>Principles of Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MEM 5300</td>
<td>Principles of Data Analytics</td>
<td>3</td>
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<tr>
<td>MEM 6100</td>
<td>Complex Project Management</td>
<td>3</td>
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<td>MEM 6281</td>
<td>Supply Chain Management</td>
<td>3</td>
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<td>MEM 6285</td>
<td>Project Risk Management</td>
<td>3</td>
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<tr>
<td>MEM 6287</td>
<td>Advanced Data Analytics</td>
<td>3</td>
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<tr>
<td>MIA 5130</td>
<td>System optimization and management</td>
<td>3</td>
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<tr>
<td>MIA 6160</td>
<td>Cyber Security Systems and Strategies</td>
<td>3</td>
</tr>
<tr>
<td>MIA 6180</td>
<td>Strategic Knowledge Management</td>
<td>1.5</td>
</tr>
<tr>
<td>MIA 6260</td>
<td>Integrated Networks for Enterprise</td>
<td>1.5</td>
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Courses

MEM 5100 Introduction to Engineering Management (3 units)
Introduction to management and engineering management. The structure of engineering organizations. The importance of accounting and finance, interpersonal skills, decision-making under conditions of uncertainty. The legal, ethical, technological and global context of management decision-making. Planning and control in engineering management.
Course Component: Lecture

MEM 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.
Course Component: Lecture

MEM 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

MEM 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
MEM 5121 Taguchi Methods for Engineering R & D (3 units)
Course Component: Lecture

MEM 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

MEM 5231 Principles of Management and Leadership for Engineers (3 units)
The difference between management and leadership. Development of increased skills and understanding of participant preferences for the management of interpersonal and team-based issues and processes in a work environment. Special focus on diversity and ethics in a team environment. Effective business communications, including skills for delivery of high quality business presentations; exposure to common business software for inclusion in the student’s professional toolbox.
Course Component: Lecture

MEM 5241 Principles of Accounting and Finance for Engineers (3 units)
The difference between accounting and finance. The role of the accounting function internal to the organization. A broad view of managerial accounting, introducing various costing systems, cost behaviour patterns, cost structures, budgeting and variances. 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. Financial management and the financial environment. Risk and rates of return. Discounted cash flow analysis and profitability indicators of potential capital investments.
Course Component: Lecture

MEM 5265 Business Intelligence and Performance Management (3 units)
Role of information in organizations. Overview of systems used to capture, transform and disseminate information to managers. Linkages between information and knowledge management. The process of knowledge creation and application within and among organizations. Business Intelligence (BI) as a concept. Business intelligence and performance management approaches at operational levels in the organization. Frameworks such as the Balanced Score Card and Quality Management will be covered. Review of major BI tools and methods. Identification of the right types of BI for different types of decision making environments.
Course Component: Lecture

MEM 5280 Principles of Operations Management (3 units)
Introductory course providing a broad knowledge in the field of operations in a realistic, meaningful and practical manner while explaining the different value-creation resources to any organization and how they form a solid operations framework. Operations Management (OM) is a subject that includes accounting, industrial engineering, management, supply chain management, purchasing, logistics, process engineering, manufacturing, product and service quality, and customer relationship management.
Course Component: Lecture

MEM 5300 Principles of Data Analytics (3 units)
Descriptive models, predictive models, evaluating and deploying models, and applications of such models in engineering such as smart manufacturing, intelligent transportation, intrusion/anomaly detection, heuristic optimization. Hands on experience with tools.
Course Component: Lecture

MEM 6100 Complex Project Management (3 units)
Complex projects such as major infrastructure projects, radical product innovations (e.g., autonomous vehicles), and radical operations and systems overhauls, tend to be large, tend to involve a great number of organizations, and tend to have very serious negative consequences if the project fails. As such, managing these kinds of projects requires elevated skill in systems thinking, partnership building, risk management, and information management. This course, with the aid of several case studies, demonstrates how recognition and management of these extra layers of complexity will contribute to project success.
Course Component: Lecture

MEM 6260 Project Management (3 units)
Project management methods based on standards, including the Guide to Project Management Body of Knowledge (PMBOK) of the Project Management Institute (PMI); project success and stakeholders; project charter and project plan; managing a project throughout its life cycle (identification, design, planning, realization and close-out). Projects that have incomplete and/or unstable requirements such as IT projects or software development projects. Topics covered include: portfolio management; risk management; determining requirements and solutions; quality management; communication management; design methods (Quality Function Deployment, Value Analysis); iterative and adaptive project management; fast tracking and concurrent methods of project management.
Course Component: Lecture

MEM 6281 Supply Chain Management (3 units)
Overview of supply chain management as a framework for analyzing operations management situations and as a basis for general management situations. Major elements of the supply chain. Leading edge thinking on supply chain strategy and practical tools and methods for its implementation.
Course Component: Lecture

MEM 6285 Project Risk Management (3 units)
The execution of complex projects in the context of a complex and changing environment demands expertise in risk management. This course is a comprehensive introduction to risk management definitions, concepts and principles, and their practical applications. Using real-life examples and case studies this course examines project risk management processes including risk identification, assessment, prioritization, risk management planning and auditing, and contingency plans.
Course Component: Lecture

MEM 6287 Advanced Data Analytics (3 units)
Fundamentals of Big Data as well as big database management (NoSQL) with applications in engineering and management. Review of the supporting technologies. AI concepts for advanced analytics with applications in engineering and management.
Course Component: Lecture