

# GRADUATE DIPLOMA ENGINEERING MANAGEMENT

## Summary

- Degree offered: Graduate Diploma
- Registration status options: Full-time; Part-time
- Language of instruction: English
- Program option (expected duration of the program):
  - within one year
- Academic units: Faculty of Engineering (<https://engineering.uottawa.ca/>), Telfer School of Management (<http://www.telfer.uottawa.ca/en/>)

## Program Description

The graduate diploma is awarded upon successful completion of 15 units.

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

- Master of Engineering Engineering Management (MEng)

## 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 (<https://www.uottawa.ca/about-us/leadership-governance/policies-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/>)

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Ottawa ON Canada

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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 in degree in engineering or science with a minimum 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.

### Language tests recognized by the University of Ottawa:

- TOEFL: 550 (paper-based) or 79-80 (internet-based); or
- IELTS: Overall 6.5 – Individual 5.0 (paper-based or internet-based); or
- An equivalent language test (<http://www.uottawa.ca/graduate-studies/programs-admission/apply/required-documents/>).

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 academic regulations (<https://www.uottawa.ca/about-us/leadership-governance/policies-regulations/>) in effect for graduate studies.
- Admission to the program is very competitive. Preference will be given to candidates who have a few years of full-time experience in engineering or a related field as well as a high level of proficiency in the English language.
- A maximum of three units in equivalencies or advanced standing may be granted. To be eligible, the units in question must not have counted towards the requirements of a previous diploma or degree. Candidates who have already successfully completed some of the compulsory units may be allowed to replace those units with elective units. For details, see section B.2.7. of the general regulations.

## Documents Required for Admission

In addition to the documents required (<http://www.uottawa.ca/graduate-studies/programs-admission/apply/required-documents/>) for graduate

and postdoctoral studies, candidates must submit the following documents:

- A resume
- Two confidential letters of recommendation from professors who have known the applicant and are familiar with their work.

You are strongly encouraged to contact your referee(s) prior to submitting your application in order to confirm their email address and their availability to complete your letter of recommendation.

- Transcripts from all universities attended:
  - You must submit official transcripts from all the universities you have attended.  
This applies to all courses and programs at any university you attended, including regular programs (completed or not), exchanges, letters of permission, online or correspondence courses, courses taken as a special student or visiting student, etc.
  - If the transcript and degree certificate are not in English or French, a certified translation (signed and stamped/sealed) must be submitted.

Note: Documents that are not required for admission will not be consulted, conserved or returned to the student. These documents will be destroyed according to our administrative procedures.

## 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.

**Information about how to apply to this program is available under the Apply Now (<http://www.uottawa.ca/graduate-studies/programs-admission/apply/#apply-now>) section.**

Students should complete and submit their online application with supporting documentation (if applicable) by the deadline indicated above.

## Program Requirements Graduate Diploma

Requirements for this program have been modified. Please consult the 2020-2021 calendar (<https://catalogue.uottawa.ca/en/archives/>) for the previous requirements.

Students are strongly encouraged to attend a seminar series to be offered in a variety of topics including: Continuous Risk Management, IT Procurement, and Software Rollout.

Students must meet the following requirements:

### Compulsory Courses:

12 compulsory units from: <sup>1</sup>		
ADM 6260	Project Management I	1.5 Units
EMP 5100	Introduction to Engineering Management	3 Units
EMP 5111	Creativity and Innovation	3 Units
MBA 5235	Leadership Skills	1.5 Units
MBA 5241	Management Accounting	1.5 Units
MBA 5250	Introduction to Corporate Finance	1.5 Units

### Optional Courses:

3 optional course units from: <sup>2</sup>		3 Units
ADM 6261	Project Management II	
ADM 6277	E-Business Energy Management	
ADM 6286	International E-Business Strategies for DTI	
ADM 6287	Business Intelligence Technologies and Big Data Analytics for DTI	
ADM 6420	Digital Marketing	
EMP 5101	Industrial Organization	
EMP 5102	Systems Engineering and Integration	
EMP 5103	Reliability, Quality and Safety Engineering	
EMP 5109	Topics in Engineering Management	
EMP 5116	Issues in Management and Operation of Communication Networks	
EMP 5117	Foundations of Software Engineering	
EMP 5118	Technology Project Management Practice	
EMP 5119	Project Information Management	
EMP 5120	Product Development and Management	
EMP 5121	Taguchi methods for efficient Engineering RD	
EMP 5122	Operational Excellence and Lean Six Sigma	
EMP 5169	Advanced Topics in Reliability Engineering	
EMP 5179	Manufacturing Systems Analysis	
EMP 5910	Directed Studies	
GNG 5120	Technology entrepreneurship for Engineers and Computer Scientists	
GNG 5123	Enterprise Architecture	
GNG 5124	Internet Technologies and Mobile Commerce	
GNG 5125	Data Science Applications	
GNG 5130	Communication and Influence for Engineers	
GNG 5131	Sales and Influence for Engineers	
GNG 5140	Engineering Design	
GNG 5300	Topics in Engineering	
GNG 5301	Professional Skills and Responsibility	
GNG 5310	Topics in Industry Practice	
GNG 5901	Industry Internship	
GNG 5902	Industry Project	
MBA 5270	Knowledge and Information Management	
MBA 5320	Marketing	
MBA 5330	Managing Talent Organizations	

Note(s):

1

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.

2

Optional courses enable students to develop knowledge and skills in an area of interest. 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.

## Minimum Requirements

Failure in 6 units leads to withdrawal from the program.

## Research

### Research at the University of Ottawa

Located in the heart of Canada's capital, a few steps away from Parliament Hill, the University of Ottawa ranks among Canada's top 10 research universities. Our research is founded on excellence, relevance and impact and is conducted in a spirit of equity, diversity and inclusion.

Our research community thrives in four strategic areas:

- Creating a sustainable environment
- Advancing just societies
- Shaping the digital world
- Enabling lifelong health and wellness

From advancing healthcare solutions to tackling global challenges like climate change, the University of Ottawa's researchers are at the forefront of innovation, making significant contributions to society and beyond.

### 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/study/graduate-studies/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

### ADM 6260 Project Management I (1.5 unit)

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). Students will have hands-on experience using MS Project.

**Course Component:** Lecture

### ADM 6261 Project Management II (1.5 unit)

Focus on 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

### ADM 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

### ADM 6286 International E-Business Strategies for DTI (1.5 unit)

International trends in the global economy together with assessment of risks, and associated international e-business opportunities. Strategies for translating international opportunities into e-businesses, including localizing international web-based content, developing international supply networks, international crowdsourcing, international payments and international collaboration. How to address local laws on privacy, intellectual property and business contracts. Courses ADM 6274, ADM 6286 cannot be combined for units.

**Course Component:** Lecture

Exclusion: ADM 6274

### ADM 6287 Business Intelligence Technologies and Big Data Analytics for DTI (1.5 unit)

Business Intelligence (BI) as a concept; review of major BI tools and methods; identification of the right types of BI for different types of decision making environments; introduction to Big Data; business applications of Big Data; review of the supporting technologies such as data bases and data warehouses and Big Data Platforms for integrating structured and unstructured data including Hadoop, sandbox analytics; Streaming Analytics, and advances in data warehousing appliances that accelerate analytics. Courses ADM 6275, ADM 6287 cannot be combined for units.

**Course Component:** Lecture

Exclusion: ADM 6275

### EMP 5109 Topics in Engineering Management (3 units)

Current topics in industrial practice

**Course Component:** Lecture

**ADM 6420 Digital Marketing (1.5 unit)**

Fundamentals of using the Internet for marketing tasks. Strategic implications of the Internet for Marketing. Marketing models for Electronic Commerce. Customer retention, customization, value-based pricing, branding, advertising in the context of Electronic Commerce. WWW and the pricing, promotion and distribution of goods.

**Course Component:** Lecture

**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 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 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 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 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.

**GNG 5124 Internet Technologies and Mobile Commerce (3 units)**

An examination of current Internet technologies, protocols and wired and wireless infrastructures. Analysis of current Internet-based businesses and consumer applications and services. Discussion of mobile commerce business models and strategies and their relevant technologies. Hands-on experience with discussed technologies and applications. Students will complete a project demonstrating and analyzing how an Internet-based application or service could be applied in their field of graduate study.

**Course Component:** Lecture

The courses DTI 5124, GNG 5124 cannot be combined for units.

**MBA 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

**MBA 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

Prerequisite: MBA 5340

**MBA 5270 Knowledge and Information Management (1.5 unit)**

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.

**Course Component:** Lecture

**MBA 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

**MBA 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