

# MASTER OF ENGINEERING ELECTRICAL AND COMPUTER ENGINEERING AND CONCENTRATION APPLIED ARTIFICIAL INTELLIGENCE

## Overview

### Summary

- Degree offered: Master of Engineering (MEng)
- Registration status options: Full-time
- Language of instruction: English
- Program options (expected duration of the program):
  - within two years of full-time study
- Academic units: Faculty of Engineering (<http://engineering.uottawa.ca/>), School of Electrical and Computer Science (<http://engineering.uottawa.ca/eecs/>)

## Program Description

This program satisfies the requirements of the general Masters of Engineering Electrical and Computer Engineering Program, but provides a concentration in Applied Artificial Intelligence by taking a minimum 12 units of courses in the area. As electrical and computer engineers develop new generation systems, devices, applications and networks, it is critical to understand how to effectively, safely and responsibly leverage artificial intelligence theory and methodologies so to integrate them with system design and development. Core courses focus on Applied Machine Learning and Ethics for Design, AI, and Robotics. Furthermore, the students are able to specialize in option courses on deep learning, reinforcement learning, uncertainty, intelligence-enabled communications, autonomous, networked and multi-agent systems, adaptive signal processing, robotics, vision, and smart cities. Graduates of this concentration are equipped with the knowledge and skills to combine theory, research and practice in artificial intelligence to enable filling a wide range of career vacancies in industry, government and academia.

## Main Areas of Research

- Computer communications, multimedia and distributed systems
- Computer-aided design for electronic circuit
- Computer and software engineering
- Wired/Wireless communications/networks
- Microwave and electromagnetics
- Signal, speech and image processing
- Integrated circuits and devices
- Machine Learning
- Photonics systems
- Biomedical engineering
- Robotics and autonomous systems
- Cybersecurity

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

- Master of Applied Science Electrical and Computer Engineering (MAsc)
- Master of Applied Science Electrical and Computer Engineering with Concentration in Applied Artificial Intelligence (MAsc)
- Master of Applied Science Electrical and Computer Engineering Specialization in Science, Society and Policy (MAsc)
- Doctorate in Philosophy Electrical and Computer Engineering (PhD)

## 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 at the University of Ottawa.
- 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](mailto:engineering.grad@uottawa.ca)

Twitter | Faculty of Engineering (<https://twitter.com/uOttawaGenie/?lang=en>)  
Facebook | Faculty of Engineer (<https://www.facebook.com/uottawa.engineering/>)

## Admissions 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 a major (or equivalent) in electrical and computer engineering (or equivalent) with a minimum average of 75% (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

Courses are delivered in English as the international language for advanced technology in engineering. However, the program will provide an appropriately supportive environment for francophone students to develop professional competence in technical English at their own pace. Students have the right, as stipulated in the University's bilingualism regulations (Academic Regulations I-2), to complete all their work, including their project, in the official language of their choice (French or English). There are fully bilingual professors and advisors who can support students in French.

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.
- Test scores cannot be more than two-years-old as of September 1 of the year of potential entry into the program.

## 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.

## Applying to the CO-OP Option

In order to apply to the CO-OP option, you must first be admitted to a program that offers CO-OP.

Your application must be submitted by the end of the first month of enrollment in your primary program, i.e., by the end of September.

Admission to the CO-OP option occurs on a competitive basis and is managed by the CO-OP Office. Enquiries should be directed to that office.

To be admitted to the CO-OP option, you must:

- Be enrolled as a full-time student in the Master of Engineering in Electrical and Computer Engineering Program.
- Have and maintain a minimum CGPA of 7.0 (B+ or 75%) in courses taken at the University of Ottawa.
- Be a Canadian citizen, a permanent resident or an international student (authorization or diplomat)
- Pay the required CO-OP fees.

## Program Requirements

Requirements for this program have been modified. Please consult the 2021-2022 calendars (<http://catalogue.uottawa.ca/en/archives/>) for the previous requirements.

To receive this Master's degree, a student enrolled in the program must successfully complete 27 course units.

Students must meet the following requirements:

### Compulsory Courses:

ELG 5301	Professional Skills and Responsibility <sup>1</sup>	3 Units
ELG 5255	Applied Machine Learning	3 Units
ELG 5295	Ethics for Design, AI, and Robotics	3 Units
3 optional course units from the list of optional courses in Applications		3 Units
3 optional course units from the list of optional courses in Foundations or the list of optional courses in Applications		3 Units
3 optional course units from:		3 Units
GNG 5120	Technology entrepreneurship for Engineers and Computer Scientists	
GNG 5130	Communication and Influence for Engineers	
GNG 5140	Engineering Design	
3 elective course units in general engineering (GNG) or electrical engineering (ELG) at the graduate level		3 Units

### Project:

ELG 5901	Electrical Engineering Project	6 Units
Or		
ELG 5902	Industry Internship Project	6 Units

Note(s)

1

ELG 5301 should be completed during the first trimester of registration in the program.

### List of Optional Courses in Applications:

ELG 5121	Multimedia Communications	3 Units
ELG 5142	Ubiquitous Sensing for Smart Cities	3 Units
ELG 5143	AI-Enabled Wireless Networks	3 Units
ELG 5163	Machine Vision	3 Units
ELG 5218	Uncertainty Evaluation in Engineering Measurements and Machine Learning	3 Units
ELG 5228	Mobile Robotics	3 Units
ELG 5271	Topics in Applied Artificial Intelligence	3 Units

### List of Optional Courses in Foundations:

ELG 5131	Graphical Models	3 Units
ELG 5161	Robotics: Control, Sensing and Intelligence	3 Units
ELG 5170	Information Theory	3 Units
ELG 5214	Deep Learning and Reinforcement Learning	3 Units
ELG 5377	Adaptive Signal Processing	3 Units
ELG 5386	Neural Networks and Fuzzy Systems	3 Units

## CO-OP Option

To remain enrolled in the CO-OP option, students must meet the following requirements:

- Be enrolled as a full-time student in the Master of Engineering in Electrical and Computer Engineering (MEng);
- Maintain a cumulative grade point average of 7.0 (B+ or 75%);
- Obtain a satisfactory grade (P) for each CO-OP work term: CGI 6001, CGI 6002.

Notes:

- The CO-OP option gives selected students the opportunity to acquire practical work experience by completing two one-session, paid work replacements.
- Each work term is graded (P/F (Pass or Fail), based on the employer's report and on a written report completed by the student.
- The units awarded for CO-OP terms may not be used to obtain equivalences for other courses. In other words, the CO-OP units are additional to the minimum requirements of the degree.

## Minimum Requirements

The passing grade in all courses is B.

## Research

### 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.**