MASTER OF APPLIED SCIENCE ELECTRICAL AND COMPUTER ENGINEERING WITH CONCENTRATION IN APPLIED ARTIFICIAL INTELLIGENCE

Overview

Summary
• Degree offered: Master of Applied Science (MASc)
• 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
• 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 Applied Science Electrical and Computer Engineering Program, but provides a concentration in Applied Artificial Intelligence by taking a minimum of 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 circuits
• 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 Specialization in Science, Society and Policy (MASc)
• Master of Engineering Electrical and Computer Engineering (MEng)
• 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.
• Research activities can be conducted either in English, French or both, depending on the language used by the professor and the members of his or her research group.

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
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 admission average of 75% (B+).
- Demonstrate a good academic performance in previous studies as shown by official transcripts, research reports, abstracts or any other documents demonstrating research skills.
- Identify at least one professor who is willing to supervise your research and thesis.
  - We recommend that you contact potential thesis supervisors as soon as possible.
  - To enroll, you need to have been accepted by a thesis supervisor.
  - The supervisor’s name is required at the time of application.

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 thesis, 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.

Program Requirements
Master’s with Thesis

Compulsory Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELG 5255</td>
<td>Applied Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5295</td>
<td>Ethics for Design, AI, and Robotics</td>
<td>3</td>
</tr>
<tr>
<td>3 optional course units from the list of optional courses in Applications</td>
<td>3 units</td>
<td></td>
</tr>
</tbody>
</table>

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 in Electrical Engineering (ELG) at the graduate level 3 Units

Thesis:
THM 7999  Master’s Thesis 1

Note(s)
1 Students are responsible for ensuring they have met all of the thesis requirements (http://www.uottawa.ca/graduate-studies/students/theses/). The thesis must be based on original research carried out under the direct supervision of a research faculty member in the Department.

List of Optional Courses in Applications:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELG 5121</td>
<td>Multimedia Communications</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5142</td>
<td>Ubiquitous Sensing for Smart Cities</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5143</td>
<td>AI-Enabled Wireless Networks</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5163</td>
<td>Machine Vision</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5218</td>
<td>Uncertainty Evaluation in Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Measurements and Machine Learning</td>
<td></td>
</tr>
<tr>
<td>ELG 5228</td>
<td>Mobile Robotics</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5271</td>
<td>Topics in Applied Artificial Intelligence</td>
<td>3</td>
</tr>
</tbody>
</table>

List of Optional Courses in Foundations:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELG 5131</td>
<td>Graphical Models</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5161</td>
<td>Robotics: Control, Sensing and Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5170</td>
<td>Information Theory</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5196</td>
<td>Automata and Neural Networks</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5214</td>
<td>Deep Learning and Reinforcement Learning</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5377</td>
<td>Adaptive Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>ELG 5386</td>
<td>Neural Networks and Fuzzy Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Minimum Requirements
The passing grade in all courses is B.

Fast-Track from Master’s to PhD
Students enrolled in the master’s program in electrical and computer engineering at the University of Ottawa may be eligible to fast-track directly into the doctoral program without writing a master’s thesis. For additional information, please consult the “Admission Requirements” section of the PhD 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](https://www.uottawa.ca/graduate-studies/students/academic-unit-contact-information/).

**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/](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.