MASTER OF APPLIED SCIENCE ENVIRONMENTAL ENGINEERING SPECIALIZATION IN ENVIRONMENTAL SUSTAINABILITY

**Summary**
- Degree offered: Master of Applied Science (MASc)
- Registration status options: Full-time; Part-time
- Language of instruction: English

  Most of the courses in this program are offered in English. Research activities can be conducted in English, French, or both, depending on the language used by the professor and the members of his or her research group.

  - Primary program: MASc in Environmental Engineering
  - Collaborative specialization: Environmental Sustainability
  - Program option (expected duration of the program):
    - with thesis (6 full-time terms; 24 consecutive months)

**Program Description**

**Ottawa-Carleton Joint Program**

Established in 2000, the Ottawa-Carleton Institute of Environmental Engineering (OCIEE) combines the teaching and research strengths of the Department of Civil Engineering and the Department of Chemical Engineering at the University of Ottawa with that of the Departments of Civil and Environmental Engineering at Carleton University.

The Institute offers graduate programs leading to the degrees of Master of Applied Science in Environmental Engineering (MASc), Master of Applied Science in Environmental Engineering (MASc) Specialization in Environmental Sustainability, a Master of Engineering (MEng) and Doctor of Philosophy (PhD) in Environmental Engineering.

**Collaborative Specialization Description**

The Institute of the Environment offers a master’s level collaborative specialization in Environmental Sustainability and an interdisciplinary Master of Science (MSc) in Environmental Sustainability. The master’s level collaborative specialization in Environmental Sustainability allows students enrolled in one of the participating master’s programs to specialize in environmental sustainability.

The guiding objective of the collaborative program is to provide graduate students with the knowledge and skills needed to identify and analyze the economic, legal, policy and scientific dimensions of environmental problems, and to employ an evidence-based approach to develop rational policy options for addressing those problems.

The degree awarded specifies the primary program and indicates “Specialization in Environmental Sustainability.”

**Main Areas of Research**
- Water and waste processing or treatment
- Management of solid and hazardous waste
- Air pollution
- Water resources and groundwater management

Note: Further information is posted on the departmental website.

**Learning Outcomes**
- Autonomy in conducting research
- Autonomy in preparing scholarly publications

**Other Programs Offered Within the Same Discipline or in a Related Area**
- Master of Applied Science Environmental Engineering (MASc)
- Master of Applied Science Civil Engineering (MASc)
- Master of Applied Science Civil Engineering Specialization in Science, Society and Policy (MASc)
- Master of Engineering Environmental Engineering (MEng)
- Master of Engineering Civil Engineering (MEng)
- Doctorate in Philosophy Environmental Engineering (PhD)
- Doctorate in Philosophy Civil 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 and by the general regulations of the Ottawa-Carleton Institute of Environmental Engineering (OCIEE).
- 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 (http://engineering.uottawa.ca/about/programs/graduate)
161 Louis-Pasteur, Colonel By Hall, Room B111
Ottawa, Ontario, Canada
K1N 6N5

Tel.: 613-562-5800 x6189
Email: engineering.grad@uottawa.ca

Twitter | Faculty of Engineering (https://twitter.com/uOttawaGenie?lang=en)
Facebook | Faculty of Engineering (https://www.facebook.com/uottawa.engineering)
Twitter | Institute of the Environment (https://twitter.com/uoEnvironment)
Facebook | Institute of the Environment (https://www.facebook.com/uOttawaIE)

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 (http://www.uottawa.ca/graduate-studies/programs-admission/apply/specific-requirements) webpage.

To be eligible, candidates must:
• Have one of the following:
  • An honours bachelor’s degree with a specialization or a major in environmental engineering (or equivalent) with a minimum average of 70% (B);
  • An honours bachelor’s degree with a specialization or a major in related engineering disciplines (civil, chemical, mechanical, etc.) with a minimum average of 70% (B);
  • An honours bachelor’s degree with specialization or a major in environmental science disciplines with a minimum average of 70% (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 register, you need to have been accepted by a thesis supervisor.
  • The supervisor’s name is required at the time of application.
• Meet the following additional requirements:
  • All students entering the program are required to have courses in mathematics, probability and statistics equivalent to courses required in undergraduate engineering programs.
  • All students entering the program are also required to have taken three undergraduate courses equivalent to the following University of Ottawa courses:
    • CHG 2312 or CVG 2116
    • CVG 2132
    • CVG 3132
  • These courses are considered to provide the minimum background in fluid mechanics, and in physical, chemical, and biochemical treatment principles, necessary to adequately follow environmental engineering courses at the graduate level. Depending on their background, students may have been exposed to these principles through a different combination of courses in their undergraduate curriculum. Students entering the program without an equivalent background in these topics are expected to take these courses early in their studies and they are considered additional to those normally required for the degree. The undergraduate courses required are specified in the certificate of admission.

Language Requirements
Applicants must be able to understand and fluently speak the language of instruction (French or 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 and by the general regulations of the Ottawa-Carleton Institute of Environmental Engineering (OCIEE).

• Students must indicate in their initial application for admission to the master's program in environmental engineering that they wish to be accepted into a collaborative specialization in environmental sustainability. To be accepted into the collaborative program, candidates must be admitted to one of the programs participating in the collaborative program.

• In exceptional cases, students could commence their specialization in environmental sustainability at the beginning of the second term of enrollment.

• Research facilities are shared between the two campuses. Students have access to the professors, courses and facilities at both universities; however, the choice of research supervisor will determine the primary campus location of the student. It will also determine which university awards the degree.

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 letters of intent or motivation
  • Letter outlining your professional goals and proposed research area (primary program).
  • One-page cover letter indicating what research topic or area the student would like to pursue, and why the student wishes to do so as part of the collaborative program.

• Three confidential letters of recommendation, including one from a professor who is willing and available to act as thesis supervisor.

• Transcripts from all universities attended:
  • Official transcripts from all universities attended must be submitted.
    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.
  • A preference form (http://engineering.uottawa.ca/downloads/pdf/OCIENE_Preference.pdf)
  • A collaborative program enrollment form (https://www.uottawa.ca/environment/grad-programs/specialization/apply)

In the case of a thesis-based program, the collaborative enrollment form must be signed by the student’s thesis supervisor, as consent to participate in the collaborative program.

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.

Program Requirements

Master’s with Collaborative Specialization

The Department may require students to take additional courses, depending on their backgrounds.

Students must meet the following requirements for the master's with collaborative specialization:

Compulsory Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 optional course units in environmental engineering (EVG) at the graduate level</td>
<td>12 Units</td>
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</table>

Seminars:

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>EVD 5100 Seminar in Environmental Sustainability</td>
<td>3 Units</td>
</tr>
<tr>
<td>EVG 5800 Seminar for Master’s Candidates in Environmental Engineering</td>
<td>1 Unit</td>
</tr>
</tbody>
</table>

Thesis:

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>THM 7999 Master’s Thesis</td>
<td>0 Unit</td>
</tr>
</tbody>
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Note(s)

1 A minimum of 3 course units must be selected from at least three of the following areas of study:
  • Air pollution
  • Water resources management, groundwater management and contaminant transport
  • Water and waste water treatment
  • Management of solid, hazardous, and radioactive waste and pollution prevention
  • Environmental impact assessment

2 This course involves the presentation of a seminar and regular attendance at the departmental seminar series.

3 Presentation and successful defence of a thesis on a topic in environmental sustainability based on research carried out under the supervision of a professor who is a member of the student’s primary program and/or of the collaborative program. The Collaborative Program Committee determines whether or not the topic of the thesis is appropriate for the designation “Specialization in Environmental Sustainability. At least one of the thesis examiners must be a member of the Environmental Sustainability collaborative program.

4 Students are responsible for ensuring they have met all of the thesis requirements (http://www.uottawa.ca/graduate-studies/students/theses).

Minimum Requirements

The passing grade in all courses is B.

Students who fail six units, or the thesis proposal, or whose research progress report is deemed unsatisfactory are required to withdraw from the program.

Fast-track from Master’s to PhD

Students enrolled in the master's program in environmental 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 contact the graduate studies office of the Faculty of Engineering.
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.

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.

Courses

Course selection is subject to the approval of the advisor or the advisory committee. Students may choose courses offered at either university from among those listed below.

The courses listed below are grouped by area of study. Students must complete at least one course in three of the five areas. The director will decide when a course offered under a special topics or directed studies heading can be considered to meet the requirements of a given area. Course descriptions may be found in the departmental sections of the calendars concerned. Only a selection of courses given in a particular academic year.

EVG 5001 Biofilm Processes in Wastewater Treatment (3 crédits / 3 units)
Volet / Course Component: Cours magistral / Lecture

EVG 5101 Air Pollution Control (3 units)
This course is equivalent to ENVE 5101 at Carleton University.
Course Component: Lecture

EVG 5203 Hazardous and Radioactive Waste Management (3 units)
This course is equivalent to ENVE 5203 at Carleton University.
Course Component: Lecture

EVG 5200 Seminar for Master’s Candidates in Environmental Engineering (1 crédit)
Ce cours est équivalent à ENVE 5800 à la Carleton University.
Volet : Recherche

EVG 5801 Seminar for Doctoral Candidates in Environmental Engineering (3 crédits)
Ce cours est équivalent à ENVE 7800 à la Carleton University.
Volet : Recherche

EVG 5801 Projet en génie de l’environnement / Environmental Engineering Project (6 crédits / 6 units)
Ce cours est équivalent à ENVE 5900 à la Carleton University. / This course is equivalent to ENVE 5900 at Carleton University.
Volet / Course Component: Recherche / Research

EVG 6108 Directed Studies I (3 units)
This course is equivalent to ENVE 5906 at Carleton University.
Course Component: Research

EVG 6109 Directed Studies II (3 units)
This course is equivalent to ENVE 5907 at Carleton University.
Course Component: Research

EVG 6300 Special Topics in Environmental Engineering I (3 units)
Course Component: Lecture

EVG 6301 Special Topics in Environmental Engineering II (3 units)
This course is equivalent to ENVE 5701 at Carleton University.
Course Component: Lecture

EVG 6302 Special Topics in Environmental Engineering III (3 units)
This course is equivalent to ENVE 5702 at Carleton University.
Course Component: Lecture

EVG 6508 Études dirigées I (3 crédits)
Volet : Cours magistral

EVG 6509 Études dirigées II (3 crédits)
Volet : Cours magistral

EVG 6511 Seminar for Master’s Candidates in Environmental Engineering (1 crédit)
Ce cours est équivalent à ENVE 6511 à la Carleton University.
Volet : Recherche

EVG 7104 Indoor Air Quality (3 units)
This course is equivalent to ENVE 5104 at Carleton University.
Course Component: Lecture

EVG 7201 Geo-Environmental Engineering (3 units)
This course is equivalent to ENVE 5201 at Carleton University.
Course Component: Lecture

EVG 7202 Contaminant Fate Mechanisms (3 units)
This course is equivalent to ENVE 5202 at Carleton University.
Course Component: Lecture

EVG 7301 Contaminant Hydrology (3 units)
This course is equivalent to ENVE 5301 at Carleton University.
Course Component: Lecture

EVG 7302 Multiphase Flow in Soils (3 units)
This course is equivalent to ENVE 5302 at Carleton University.
Course Component: Lecture

EVG 7401 Environmental Impact Assessment of Major Projects (3 units)
This course is equivalent to ENVE 5401 at Carleton University.
Course Component: Lecture

EVG 7402 Finite Elements in Field Problems (3 units)
This course is equivalent to ENVE 5402 at Carleton University.
Course Component: Lecture

EVG 9998 Examen de synthèse / Comprehensive Examination
Volet / Course Component: Recherche / Research
Overall, the document describes various courses related to environmental sustainability, each with a specific focus on different aspects of the field. For example, the EVD 5101 Economics of Environmental Law and Policy (3 units) course explores the economic, legal, and social dimensions of environmental issues, including the role of interest representation and the use of scientific evidence in policy-making. The EVD 5113 Foundations of Environmental Policy (3 units) course delves into the formulation and implementation of environmental policy, examining various administrative factors affecting these processes. The EVD 5121 Foundations of Environmental Science (3 units) course offers a thematic understanding of the current state of environmental science, covering topics such as climate change, energy regulation, and biodiversity. These courses collectively provide a comprehensive understanding of the multifaceted nature of environmental sustainability.
EVD 5501 Approche économique et le droit de l'environnement (3 crédits)
Les enjeux environnementaux et le système de réglementation du point de vue de la science économique. Étude de la théorie qui sous-tend certains concepts économiques, tels l'efficacité, la défaillance du marché, les externalités et la valuation. Survol des concepts macroéconomiques, tels la croissance économique et la comptabilité environnementale. Application de ces concepts théoriques aux défis environnementaux tels le changement climatique, la réglementation de l'énergie, la gestion des services écologiques et la conservation de la biodiversité. Les divers outils de réglementation pour la gestion des défis liés à l'environnement, incluant la réglementation traditionnelle de type « commande et contrôle », les moyens économiques tels que la taxation environnementale et les systèmes de droits d'échanges. Évaluation de l'efficacité environnementale, sociale et économique des diverses approches, et intégration de la théorie économique dans le développement de la réglementation environnementale.
Volet : Cours magistral

EVD 5509 Développement durable appliqué (3 crédits)
Étude de cas en développement durable (changements climatiques, par exemple) pour apprendre à synthétiser l'information sur un problème à partir de plusieurs perspectives disciplinaires, pour évaluer l'information selon un schéma critique, en faisant usage de méthodes rigoureuses, et pour concevoir et évaluer des politiques ou règlements.
Volet : Séminaire

EVD 5511 Séminaire d'intégration sur le développement durable (3 crédits)
Partenariat avec des organisations travaillant en développement durable. Les étudiants forment des équipes multidisciplinaires pour étudier les dimensions scientifiques, économiques, juridiques et sociales d'un problème environnemental particulier, pour évaluer un éventail de solutions possibles et pour recommander les mesures à prendre.
Volet : Cours magistral

EVD 5513 Rudiments des politiques environnementales (3 crédits)
Étude des principaux facteurs politiques et administratifs influençant la formulation et la mise en œuvre des politiques environnementales, y compris les institutions démocratiques, les méthodes de participation des citoyens et des parties prenantes et leur influence sur les processus décisionnels des gouvernements, l'opinion publique et la définition des problèmes, le rôle des valeurs et de la science dans la formulation des politiques, le lobbying et la représentation des intérêts, le fédéralisme et la gouvernance multi-niveaux des enjeux environnementaux, et la politique internationale de l'environnement. Des études de cas situeront le Canada dans une perspective comparée et exploreront l'importance de ces facteurs politiques dans divers secteurs des politiques environnementales.
Volet : Cours magistral

EVD 5514 Compétences professionnelles pour le développement durable (1.5 crédit)
Compétences orales et écrites en communication, notamment les présentations aux comités parlementaires, la préparation de mémoires au cabinet, la rédaction d'éditoriaux, les entrevues médiatiques et la production de rapports multidisciplinaires sur les politiques publiques. Gestion de projet et de processus faisant intervenir de nombreux joueurs.
Volet : Cours magistral

EVD 5521 Rudiments des sciences de l'environnement (3 crédits)
Donne aux étudiants une compréhension thématique de l'état actuel des sciences environnementales. Principaux thèmes : éventail des enjeux environnementaux d'importance au Canada et à l'étranger ; les démarches scientifiques déployées pour comprendre et prédire les conséquences des activités humaines pour les écosystèmes ; la nature des preuves apportées par les sciences de l'environnement ; la perspective des sciences de l'environnement sur le développement durable.
Volet : Cours magistral

EVD 5522 Rudiments de l'économie de l'environnement (3 crédits)
Principaux éléments de l'économie, y compris les modèles économiques officiels et les présuppositions afférentes à l'élaboration de politiques de développement durable. Étude de divers concepts : patrimoine commun ; échec des marchés ; non évaluation des valeurs courantes ; mesures incitatives ; économie du bien-être ; réglementation ; équilibre entre équité et efficience ; instruments reposant sur les mécanismes de marché. On examinerà plus en détail les concepts fondamentaux de l'économie et leurs avantages et inconvénients pour l'examen des enjeux au carrefour de l'économie et de l'environnement. Étude de la gestion des ressources renouvelables (pêches, forêts, etc.) et non renouvelables (pétrole, gaz, minerai, etc.) et d'autres sujets en économie de l'environnement appliquée (ex. changements climatiques, destruction de la couche d'ozone, programmes de plafonnement et d'échange). Étude des institutions et programmes de compensation auxquels sont confrontés les individus et les gouvernements dans le contexte des politiques de développement durable.
Volet : Cours magistral

EVD 5523 Synthèse et évaluation de données probantes (3 crédits)
La recherche vise soit à produire des données probantes, soit à évaluer les données probantes existantes en ce qu'elles ont trait à des interventions politiques, réglementaires et établies, y compris les lacunes en la matière. Ainsi, les étudiants acquièrent les compétences nécessaires qui leur permettent de concevoir un programme de recherche de façon à en optimiser la valeur probante (en fonction des contraintes existantes) et de synthétiser les résultats de recherches existantes et d'évaluer leur valeur probante.
Volet : Cours magistral

EVD 5524 Rudiments du droit de l'environnement (3 crédits)
Rudiments du droit de l'environnement, y compris la théorie du développement durable, la division constitutionnelle des pouvoirs, les démarches visant à réglementer les questions environnementales, avec exemples de cadres légaux pour différents problèmes environnementaux et access à la justice.
Volet : Séminaire

EVD 6001 Stage coop I / Co-Op Work Term I (6 crédits / 6 units)
Expérience en milieu de travail. Évalué P (réussite) / F (échec) par un professeur du programme selon les résultats du rapport écrit et l'évaluation du superviseur de stage. Préalable : permission du responsable des études supérieures. / Experience in a workplace setting. Evaluated P (Pass) / F (Fail) by a professor in the program based on the written report and the evaluation of the internship supervisor.
Volet / Course Component: Stage / Work Term

EVD 6002 Stage coop II / Co-Op Work II (6 crédits / 6 units)
Expérience en milieu de travail. Évalué P (réussite) / F (échec) par un professeur du programme selon les résultats du rapport écrit et l'évaluation du superviseur de stage. Préalable : permission du responsable des études supérieures. / Experience in a workplace setting. Evaluated P (Pass) / F (Fail) by a professor in the program based on the written report and the evaluation of the internship supervisor.
Volet / Course Component: Stage / Work Term
EVD 6112 Selected Topics in Environmental Sustainability (3 units)
In-depth examination of a question or topic linked to new trends or research areas in environmental sustainability.
Course Component: Lecture

EVD 6512 Thèmes choisis en durabilité de l'environnement (3 crédits)
Analyse approfondie d'une problématique ou d'une question liée aux nouvelles tendances en recherche ou aux nouveaux thèmes de recherche en durabilité de l'environnement.
Volet: Cours magistral

EVD 6912 Thèmes choisis en durabilité de l'environnement / Selected Topics in Environmental Sustainability (3 crédits / 3 units)
Analyse approfondie d'une problématique ou d'une question liée aux nouvelles tendances en recherche ou aux nouveaux thèmes de recherche en durabilité de l'environnement. / In-depth examination of a question or topic linked to new trends or research areas in environmental sustainability.
Volet / Course Component: Cours magistral / Lecture
Préalable: connaissance passive de l'anglais. / Prerequisite: passive knowledge of French

EVD 6932 Lectures dirigées en durabilité de l'environnement / Directed Readings in Environmental Sustainability (3 crédits / 3 units)
Cours individuel ayant pour objectif d'approfondir les connaissances de l'étudiant dans un domaine particulier ou de lui permettre de se familiariser avec un nouveau domaine. Le sujet est déterminé et développé en consultation avec le professeur responsable et en conformité avec les directives de l'Institut de l'environnement. Le travail remis dans ce cours doit être différent de ce qui a pu être soumis dans d'autres cours, y compris le projet de recherche, la thèse ou le mémoire. On permet un maximum d'un cours de lectures dirigées par étudiant et la permission n'est accordée que dans des circonstances exceptionnelles. / Individual course aimed at deepening a student’s knowledge of a particular area or at gaining knowledge of a new area. The topic is selected and developed in consultation with the supervising professor in accordance with institute guidelines. The work submitted for this course must be different from that submitted for other courses, including the research proposal, the thesis or the research paper. Maximum of one directed readings course per student, and permission is granted only under exceptional circumstances.
Volet / Course Component: Recherche / Research
Préalable: Connaissance passive de l'anglais. / Prerequisite: Passive knowledge of French. Permission of the Department is required.

EVD 6999 Mémoire / Research Paper (6 crédits / 6 units)
Volet / Course Component: Recherche / Research

EVD 7997 Projet de thèse / Thesis Proposal
Volet / Course Component: Recherche / Research