



FOR APPROVAL

PUBLIC

OPEN SESSION

TO: UTSC Academic Affairs Committee

SPONSOR: William Gough, Vice-Principal Academic and Dean
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PRESENTER: Mary Silcox, Vice-Dean Graduate
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DATE: February 4, 2019 for February 11, 2019

AGENDA ITEM: 5

ITEM IDENTIFICATION:

Graduate Minor Curricular Modifications, Department of Physical and Environmental Sciences

JURISDICTIONAL INFORMATION:

University of Toronto Scarborough Academic Affairs Committee (AAC) “is concerned with matters affecting the teaching, learning and research functions of the Campus” (*AAC Terms of Reference, Section 4*). Under section 5.6 of its terms of reference, the Committee is responsible for approval of “Major and minor modifications to existing degree programs.” The AAC has responsibility for the approval of Major and Minor modifications to existing programs as defined by the University of Toronto Quality Assurance Process (*UTQAP, Section 3.1*).

GOVERNANCE PATH:

1. **UTSC Academic Affairs Committee [For Approval] (February 11, 2019)**

PREVIOUS ACTION TAKEN:

No previous action in governance has been taken on this item.

HIGHLIGHTS:

This package includes minor modifications to graduate curriculum, submitted by the Graduate Department of Physical and Environmental Sciences, which require governance approval. Minor modifications to curriculum are understood as those that do not have a significant impact on program or course learning outcomes. They require governance approval when they modestly change the nature of a program or course.

Two fields in the Master's of Environmental Science (MEnvSc), are being renamed as follows:

1. Biophysical Interactions in Terrestrial and Aquatic Systems will become: Terrestrial and Aquatic Systems
2. Climate Change Impact Assessment will become: Climate Change Impacts and Adaptation

These changes are being made to (1) make the field title easier for students to understand; and (2) to better reflect the topics taught in the field.

There will be no impact on students.

There has been wide consultation including with students, faculty, and cognate departments across the University.

FINANCIAL IMPLICATIONS:

There are no net financial implications to the campus operating budget.

RECOMMENDATION:

Be It Resolved,

THAT the minor modifications submitted by UTSC Graduate Department of Physical and Environmental Sciences, as described in 2019-20 Curriculum Cycle: Graduate Minor Curricular Modifications for Approval, Report 1, dated January 22, 2019, and recommended by the Vice-Principal Academic and Dean, William Gough, be approved effective as of Fall 2019 for the academic year 2019-20.

DOCUMENTATION PROVIDED:

1. 2019-20 Curriculum Cycle: Graduate Minor Curricular Modifications for Approval Report 1: Graduate Department of Physical and Environmental Sciences, dated January 22, 2019.



**2019-20 Curriculum Cycle
Graduate Minor Curriculum Modifications for Approval
Report 1: Graduate Department of Physical and Environmental Sciences**

January 22, 2019

Program Changes

Master's of Environmental Science

Summary

Renaming Field, Concentration or Emphasis:

1. Biophysical Interactions in Terrestrial and Aquatic Systems will become: Terrestrial and Aquatic Systems
2. Climate Change Impact Assessment will become: Climate Change Impacts and Adaptation

Effective Date of Change

Fall 2019

Academic Rationale

1. Biophysical Interactions in Terrestrial and Aquatic Systems is being renamed as Terrestrial and Aquatic Systems in response to feedback from students and employers who find the current field name to be confusing and/or overly complicated. We also believe the current field of study name may be somewhat inhibiting recruitment efforts.
2. Climate Change Impact Assessment is being renamed as Climate Change Impacts and Adaptation to better reflect the breadth of climate change topics taught within the field.

Impact on Students

Students currently in program will not be impacted. Any part-time students currently in program, who are not scheduled to complete this academic year, will also retain the existing field names.

For new students this will be a beneficial change. The minor name changes were indeed both largely prompted by feedback from students themselves and are well supported by students.

Consultation

The Department has consulted with current MEnvSc students via email, with current graduate affiliated faculty via email and with the former, interim and future Directors of the School of the Environment (St. George campus).

Feedback from students and faculty regarding our proposed name change for the field in Biophysical Interactions in Terrestrial and Aquatic Systems to “Terrestrial and Aquatic Systems” was very positive. Current students and affiliated faculty were polled and the feedback received

was taken into consideration.

Feedback regarding the name change for the field in Climate Change and Impact Assessment to “Climate Change Impacts and Adaptation” was positive from both students and faculty. The Director(s) of the School of Environment asked that the change be implemented after January 2019 and we have complied with this.

Resources

Promotional materials, such as brochures and recruitment stand-up posters will be updated at a cost of approximately \$1000. The Department has allocated funds for this purpose.

SGS Calendar Entry, Showing Changes

Physical and Environmental Sciences

Physical and Environmental Sciences: Introduction

Faculty Affiliation

University of Toronto Scarborough (UTSC)

Degree Programs

Environmental Science

| | |
|--------|--|
| MEnvSc | <i>Fields:</i> Biophysical Interactions in Terrestrial and Aquatic Systems Climate Change Impacts and Adaptation-Assessment Conservation and Biodiversity |
| PhD | <i>Concentrations:</i> Climate Change and the Environment Contaminant Flux Environmental Science in Transitional Economies Great Lakes Ecosystems Remediation and Restoration of Degraded Environmental Systems Urban Geoscience |

Collaborative Specializations

The following collaborative specializations are available to students in the participating degree programs as listed below:

1. Development Policy and Power
 - Environmental Science, MEnvSc
2. Environment and Health
 - Environmental Science, MEnvSc, PhD
3. Food Studies
 - Environmental Science, PhD

Overview

The Graduate Department of Physical and Environmental Sciences offers opportunities for graduate studies in environmental science, leading to the degrees of Master of Environmental Science (MEnvSc) and Doctor of Philosophy (PhD) in Environmental Science.

Contact and Address

Web: www.utsc.utoronto.ca/gradpes

Email: MEnvSc: menvsc@utsc.utoronto.ca

PhD: epick@utsc.utoronto.ca

Telephone: MEnvSc: (416) 287-7205

PhD: (416) 208-2910

Fax: (416) 287-7204

Graduate Department of Physical and Environmental Sciences
University of Toronto Scarborough
1265 Military Trail, Environmental Science & Chemistry Building
Toronto, Ontario M1C 1A4
Canada

Physical and Environmental Sciences: Environmental Science MEnvSc Master of Environmental Science

Program Description

The MEnvSc is a 12-month degree program committed to the development of well-trained practitioners in environmental science in all fields, primarily to meet the needs of industry, governments, and environmental policy/education organizations.

The MEnvSc offers three enrolment options—research, internship, and part-time studies—in each of the three fields. The three designated fields of study are:

1. ~~Biophysical Interactions in~~ Terrestrial and Aquatic Systems: A major focus is understanding the flux of contaminants and excess nutrients through surface and sub-surface environments and the methods/solutions needed to remediate contaminated or damaged environmental systems.
2. Climate Change Impacts **and Adaptation**-Assessment: Students are trained in the science, data analysis, and rigorous assessment process for the impacts of climate change on a wide range of natural and human systems.
3. Conservation and Biodiversity: A major focus is the application of ecological theory and principles to real-world conservation challenges.

In all three fields, students can opt for an internship or a research option after eight months of coursework. The Department of Physical and Environmental Sciences has the support of two dedicated internship coordinators who help students find and successfully complete an internship by focusing on development of their job seeking, interpersonal, communication, and critical thinking skills. The MEnvSc program works closely with a broad employer base for internship opportunities. Research-stream MEnvSc students receive intensive and individualized academic and research support from mentors of their choice.

Full-time and part-time study options are available in all fields and study modes.

Field: ~~Biophysical Interactions in Terrestrial and Aquatic Systems~~

Minimum Admission Requirements

- Applicants are admitted under the General Regulations of the School of Graduate Studies. Applicants must also satisfy the Graduate Department of Physical and Environmental Sciences' additional admission requirements stated below.
- Applicants whose primary language is not English, and who graduated from a university where the language of instruction and examination was not English, must demonstrate proficiency in English. See [General Regulations section 4.3](#) for requirements.
- A minimum mid-B grade average in the last two years of the undergraduate program.
- Applicants must submit a written statement explaining their objectives for entering the program and the suitability of their background. Appropriate post-graduate work experiences will be considered as part of the admission application.
- A science or engineering undergraduate degree including at least two half courses or one full course in each of chemistry, physics, calculus, and biology.

Program Requirements

- Coursework consists of 5.5 full-course equivalents (FCEs) as follows:
 - EES 1100H *Advanced Seminar in Environmental Science* (0.5 FCE)
 - Complete either:
 - 3.0 FCEs in elective courses (see the course list) and 2.0 FCEs for the internship (EES 1116Y) or
 - 3.5 FCEs in elective courses (see the course list) and 1.5 FCEs for the research paper (EES 1101Y). Students planning to complete the research paper option must complete the prerequisite EES 1114H.
- Students will choose either a research or internship option.
Research option: Each student is required to have a research supervisor. For full-time students, the intensive research necessary for the research paper will normally be completed in the final Summer session. The final research paper needs to be written in scientific journal format and will be presented and defended orally in front of an examination committee. The committee will include the supervisor and two other members of the graduate faculty.
Internship option: For full-time students, the placement in private industry, government, or a non-governmental organization (NGO) will normally be completed in the final Summer session. It will consist of a minimum of four consecutive months. Successful completion of the internship is based on an assessment completed by the student's work supervisor and on an assessment of a written placement project report.
- A final grade below 70% in any course equates to an FZ, which is an insufficient grade. A MEnvSc student who receives more than one final grade of FZ (i.e., two or more) will be recommended for termination of registration from the MEnvSc program.

Program Length

3 sessions full-time (typical registration sequence: F/W/S);

6 sessions part-time

Time Limit

3 years full-time;

6 years part-time

Field: Climate Change Impacts and Adaptation Assessment

Minimum Admission Requirements

- Applicants are admitted under the General Regulations of the School of Graduate Studies. Applicants must also satisfy the Graduate Department of Physical and Environmental Sciences' additional admission requirements stated below.
- Applicants whose primary language is not English and who graduated from a university where the language of instruction and examination was not English must demonstrate proficiency in English. See [General Regulations section 4.3](#) for requirements.
- A minimum mid-B grade average in the last two years of the undergraduate program.
- Applicants must submit a written statement explaining their objectives for entering the program and the suitability of their background. Appropriate post-graduate work experiences will be considered as part of the admission application.
- A science or engineering undergraduate degree including at least two half courses or one full course in each of chemistry, physics, calculus, and biology.

Program Requirements

- Coursework consists of 5.5 full-course equivalents (FCEs) as follows:
 - EES 1100H *Advanced Seminar in Environmental Science* (0.5 FCE)
 - EES 1117H *Climate Change Impact Assessment* (0.5 FCE)
 - EES 1132H *Climate Data Analysis* (0.5 FCE)
 - EES 1133H *Climate Change Science and Modelling* (0.5 FCE)
 - Completion of two of the following three courses:
 - EES 1131H *Applied Climatology* (0.5 FCE)
 - EES 1134H *Climate Change Policy* (0.5 FCE)
 - EES 1136H *Climate Change Adaptation* (0.5 FCE)
 - Completion of either:
 - 0.5 FCE in elective courses (see course list) and 2.0 FCEs for the internship (EES 1116Y), or
 - 1.0 FCE in elective courses (see course list) and 1.5 FCEs for the research paper (EES 1101Y). Students planning to complete the research paper option must complete the prerequisite (EES 1114H).
- Students will choose either a research or internship option.

Research option: Each student is required to have a research supervisor. For full-time students, the intensive research necessary for the research paper will normally be completed in the final Summer session. The final research paper needs to be written in scientific journal format and will be presented and defended orally in front of an examination committee. The committee will include the supervisor and two other members of the graduate faculty.

Internship option: For full-time students, the placement in private industry, government, or a non-governmental organization (NGO) will normally be completed in the final Summer session. It will consist of a minimum of four consecutive months. Successful completion of

the internship is based on an assessment completed by the student's work supervisor and on an assessment of a written placement project report.

- A final grade below 70% in any course equates to an FZ, which is an insufficient grade. A MEnvSc student who receives more than one final grade of FZ (i.e., two or more) will be recommended for termination of registration from the MEnvSc program.

Program Length

3 sessions full-time (typical registration sequence: F/W/S);
6 sessions part-time

Time Limit

3 years full-time;
6 years part-time

Field: Conservation and Biodiversity

Minimum Admission Requirements

- Applicants are admitted under the General Regulations of the School of Graduate Studies. Applicants must also satisfy the Graduate Department of Physical and Environmental Sciences' additional admission requirements stated below.
- Applicants whose primary language is not English and who graduated from a university where the language of instruction and examination was not English must demonstrate proficiency in English. See [General Regulations section 4.3](#) for requirements.
- A minimum mid-B grade average in the last two years of the undergraduate program.
- Applicants must submit a written statement explaining their objectives for entering the program and the suitability of their background. Appropriate post-graduate work experiences will be considered as part of the admission application.
- An undergraduate degree in biology or a closely related field.

Program Requirements

- Coursework consists of 5.5 full-course equivalents (FCEs) as follows:
 - EES 1100H *Advanced Seminar in Environmental Science* (0.5 FCE)
 - EES 3000H *Applied Conservation Biology* (0.5 FCE)
 - EES 3001H *Professional Scientific Literacy* (0.5 FCE)
 - EES 3002H *Conservation Policy* (0.5 FCE)
 - EES 3003H *Topics in Applied Biodiversity* (0.5 FCE)
 - Completion of either:
 - 1.0 FCE in elective courses (see the course list) and 2.0 FCEs for the internship (EES 1116Y) or
 - 1.5 FCEs in elective courses (see the course list) and 1.5 FCEs for the research paper (EES 1101Y).
- Students will choose either a research or internship option.
Research option: Each student is required to have a research supervisor. For full-time students, the intensive research necessary for the research paper will normally be completed in the final Summer session. The final research paper needs to be written in scientific journal format and

will be presented and defended orally in front of an examination committee. The committee will include the supervisor and two other members of the graduate faculty.

Internship option: For full-time students, the placement in private industry, government, or a non-governmental organization (NGO) will normally be completed in the final Summer session. It will consist of a minimum of four consecutive months. Successful completion of the internship is based on an assessment completed by the student's work supervisor and on an assessment of a written placement project report.

- A final grade below 70% in any course equates to an FZ, which is an insufficient grade. A MEnvSc student who receives more than one final grade of FZ (i.e., two or more) will be recommended for termination of registration from the MEnvSc program.

Program Length

3 sessions full-time (typical registration sequence: F/W/S);

6 sessions part-time

Time Limit

3 years full-time;

6 years part-time

Physical and Environmental Sciences: Environmental Science MEnvSc Courses

Please note that not all courses are offered every year.

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| EES 1100H | Advanced Seminar in Environmental Science |
| EES 1101Y | Research Paper in Environmental Science |
| EES 1102H | Analytical Chemistry for Geoscientists |
| EES 1103H | Field Measurements and Sampling: The Essentials |
| EES 1104H | Microorganisms and the Environment |
| EES 1105H | Soil Contamination Chemistry |
| EES 1106H | Geological Evolution and Environmental History of North America |
| EES 1107H | Remediation Methods |
| EES 1108H | Environmental Science Field Camp |
| EES 1109H | Advanced Techniques in Geographic Information Systems |
| EES 1110H | Sediment and Contaminant Transport in Aquatic Systems |
| EES 1111H | Freshwater Ecology and Biomonitoring |
| EES 1112H | Boundary Layer Climates and Contaminant Fate |
| EES 1113H | Groundwater Hydrochemistry and Contaminant Transport |
| EES 1114H | Directed Readings in Environmental Science I |
| EES 1115H | Directed Readings in Environmental Science II |
| EES 1116Y | Internship |
| EES 1117H | Climate Change Impact Assessment |
| EES 1118H | Fundamentals of Ecological Modelling |
| EES 1119H | Quantitative Environmental Analysis |
| EES 1120H | Fluid Dynamics of Contaminant Transport |

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| EES 1121H | Modelling the Fate of Organic Chemicals in the Environment |
| EES 1122H | Global Environmental Security and Sustainable Development |
| EES 1123H | Environmental Regulations |
| EES 1124H | Environmental Project Management |
| EES 1125H | Contaminated Site Remediation |
| EES 1126H | Hydrology and Watershed Management |
| EES 1127H | Biogeochemical Principles: Applications for Sustainable Ecosystem Restoration |
| EES 1128H | Biophysical Interactions in Managed Environments |
| EES 1129H | Brownfields Redevelopment |
| EES 1130H | Ontario BioGeospheres Field Course |
| EES 1131H | Applied Climatology |
| EES 1132H | Climate Data Analysis |
| EES 1133H | Climate Change Science and Modelling |
| EES 1134H | Climate Change Policy |
| EES 1135H | Environmental Change and Human Health |
| EES 1136H | Climate Change Adaptation |
| EES 1137H | Quantitative Applications for Data Analysis |
| EES 1701H | Environmental Legislation and Policy |
| EES 1704H | Environmental Risk Assessment |
| EES 3000H | Applied Conservation Biology |
| EES 3001H | Professional Scientific Literacy |
| EES 3002H | Conservation Policy |
| EES 3003H | Topics in Applied Biodiversity |
| EES 3111H | Conservation Genetics |
| EES 3113H | Topics in Population and Community Ecology |
| EES 3114H | Topics in Urban and Rural Ecology |