UNIVERSITY OF TORONTO SCARBOROUGH

OFFICE OF THE CAMPUS COUNCIL

FOR APPROVAL **PUBLIC** **OPEN SESSION**

TO: UTSC Academic Affairs Committee

SPONSOR: Prof. William Gough, Vice-Principal Academic and Dean
CONTACT INFO: 416-208-7027, vpdean@utsc.utoronto.ca

PRESENTER: Prof. Mary Silcox, Vice-Dean Graduate
CONTACT INFO: 416-208-2978, vdeangrad@utsc.utoronto.ca

DATE: March 18 for March 25, 2020

AGENDA ITEM: 8

ITEM IDENTIFICATION:

Minor Curricular Modifications from the Graduate 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] (March 25, 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.

Changes are being made to:

1. Master of Environmental Science
    - EES1132H, which is a required course in the Climate Change Impacts and Adaptation field will be jointly offered with a new undergraduate course, EESD21H3. Students who complete EESD21H3 prior to admission to the MEnvSc, who have achieved a minimum grade of 70%, will not be required to repeat EES1132H; instead, they will be able to replace EES1132H with another graduate elective course.
2. EES1127H
    - The course title has been revised to better reflect the course content.
3. EES1132H
    - The course description has been revised to reflect minor changes in course content.

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

FINANCIAL IMPLICATIONS:

There are no net 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 2020-21 Curriculum Cycle: Graduate Minor Curriculum Modifications for Approval, Report 1 and Report 2, dated March 10, 2020, and recommended by the Vice-Principal Academic and Dean, Professor William Gough, be approved to be effective as of Fall 2020 for the academic year 2020-21.

DOCUMENTATION PROVIDED:

1. 2020-21 Curriculum Cycle: Graduate Minor Curriculum Modifications for Approval Report 1: Graduate Department of Physical and Environmental Sciences, dated March 10, 2020.
2. 2020-21 Curriculum Cycle: Graduate Minor Curriculum Modifications for Approval Report 2: Graduate Department of Physical and Environmental Sciences, dated March 10, 2020.

UNIVERSITY OF TORONTO SCARBOROUGH

2020-21 Curriculum Cycle
Graduate Minor Curriculum Modifications for Approval
Report 1: Graduate Department of Physical and Environmental Sciences
Program Changes
March 10, 2020

Master's of Environmental Science

Summary

	Changing Admission Requirements		*Renaming Field, Concentration or Emphasis*
x	*Changing Program Length or Requirements*		*Renaming of Program or Degree*
	Changing Timing of Program Requirements		*Creating a new Emphasis*
	Adding/Removing Option (i.e. part-time, flex-time)		*Changes to programs affecting a MOA*
A required course in the CCIA field of the MEnvSc, EES1132H, will be jointly offered with a new undergraduate course, EESD21H3 (proposal submitted). Students who complete EESD21H3, and achieve a minimum grade of 70%, will not be required to complete EES1132H; instead, they will be asked to replace EES1132H with another elective graduate course of the same credit weight (0.5 credit). The calendar description for the CCIA field has been revised to reflect this change.			

Effective Date of Change

September 2020

Academic Rationale

EES1132H, which is a required course in the CCIA field of the MEnvSc program, will now be jointly offered with a new undergraduate course, EESD21H3. Students who complete EESD21H3 prior to their admission to the MEnvSc, and who achieved a minimum grade of 70% in the course, should not have to repeat the same material in EES1132H. Since the CCIA field of the MEnvSc has 5.0 FCE (of the total of 5.5 FCE) as required courses, it is reasonable to permit students who have completed EESD21H3 as part of their undergraduate studies to replace it with 0.5 FCE in other graduate elective courses. This change does not compromise the rigour of the MEnvSc program.

Impact on Students

Students who have completed EESD21H3 as part of their undergraduate studies at UTSC will have slightly more flexibility in completing their program requirements for the MEnvSc. This change will only impact a small number of students, since most students in the CCIA field come from outside UTSC.

Consultation

There has been extensive consultation within the GPES, including among the EES faculty, and with the Graduate Associate Chair, the EES programs Supervisor of Studies, the Dean's Office, and the Departmental Teaching and Curriculum Committee. October 1, 2019: DPES Teaching and Curriculum Committee approved the proposal.

Resources

Currently there are adequate TA resources to accommodate one or two additional students in any of the Department's graduate courses; however, if historic patterns change the Department will revisit the distribution of TA resources.

Governance Approval

Unit Sign-Off (Committee name and meeting date)	DPES Graduate Program Committee – September 17, 2019
Dean's Office Sign-Off (Name and Date)	**Mary Silcox, Vice-Dean Graduate; January 31, 2020**
Faculty/Division Council Approval (or delegated body) if applicable	**UTSC Academic Affairs Committee, March 25, 2020**

SGS Calendar Entry, Showing Changes

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. **Climate Change Impacts and Adaptation**: 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.
2. **Conservation and Biodiversity**: A major focus is the application of ecological theory and principles to real-world conservation challenges.
3. **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.

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: Climate Change Impacts and Adaptation

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)
  [Note: students who have completed EESD21H3 as part of their undergraduate degree, and achieved a minimum grade of 70%, should replace EES1132H with another elective graduate course of the same credit weight (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 internship 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, the satisfactory completion of a written experience report, and the satisfactory completion and presentation of a poster highlighting the internship experience.
- 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 internship 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, the satisfactory completion of a written experience report, and the satisfactory completion and presentation of a poster highlighting the internship experience.

- 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: 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 internship 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, the satisfactory completion of a written experience report, and the satisfactory completion and presentation of a poster highlighting the internship experience.

- 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

UNIVERSITY OF TORONTO SCARBOROUGH

2020-21 Curriculum Cycle
Graduate Minor Curriculum Modifications for Approval
Report 2: Graduate Department of Physical and Environmental Sciences
Course Changes
March 10, 2020

EES1127H: Biogeochemical Principles: Applications for Sustainable Ecosystem Restoration

Title: ~~Biogeochemical Principles : Applications for Sustainable Ecosystem Restoration~~ Applied Biogeochemistry and Geomicrobiology
Abbreviated Title: ~~Sustainable Ecosys Restoration~~ Biogeochemistry & Geomicrobio
Rationale: The title has been updated to better reflect the course content.
Consultation: Approved by DPES Graduate Program Committee September 17, 2019
Resources: None

EES1132H: Climate Data Analysis

Abbreviated Title: ~~CLIMATE DATA ANALYSIS~~ Climate Data Analysis

Description:
This course offers ~~will offer~~ an advanced introduction to climate data analysis ~~. It is intended for graduate students studying climate science and is mainly laboratory (computer) based~~ . The ~~For the first part of the course , the~~ goal is to provide an overview ~~understanding~~ of ~~the theory underlying the~~ statistical methods used to interpret ~~analysis of~~ climate data ~~,~~ in the space, time and spectral domains ~~domain . In the second part of the course , the basic concepts of time series analysis will be introduced in terms of identifying stationarity or trends in the data~~ . Statistical ~~Some of the important statistical estimation~~ techniques such as regression, correlation and spectral analysis of ~~will be used for the~~ time series will be explored with ~~analysis by giving~~ a focus ~~detailed account~~ on hypothesis formulation , application to real-world problems and ~~the~~ interpretation of ~~the data and~~ the analysis . Multivariate approaches will also be introduced ~~associated climatological questions~~ . Although some previous knowledge of probability and statistics will be helpful, a review will be provided at the beginning of the course. Concepts and notation will be introduced ~~reintroduced~~ , as needed.
Jointly offered with EESD21H3 ~~If time permits , the statistical modelling approach will also be covered.~~

Exclusions: EESD21H3
Rationale: The course description has been modified to reflect minor changes in the course content in recent years. In addition, the course description previously indicated that this course is only for graduate students; the description has also been modified to reflect that the course will now be cross-listed with a new D-level undergraduate courses (EESD21H3 - proposal submitted).
Consultation: Approved by DPES Graduate Program Committee September 17, 2019.
Resources: None