FOR RECOMMENDATION **PUBLIC** **OPEN SESSION**

TO:	UTSC Academic Affairs Committee
SPONSOR:	Prof. Karin Ruhlandt, Vice-Principal Academic & Dean
CONTACT INFO:	vpdean.utsc@utoronto.ca
PRESENTER:	Prof. Katherine R. Larson, Vice-Dean Teaching, Learning & Undergraduate Programs
CONTACT INFO:	vdundergrad.utsc@utoronto.ca
DATE:	April 30, 2025 for May 7, 2025
AGENDA ITEM:	5

ITEM IDENTIFICATION:

New Program: Undergraduate Major in Climate Change Studies (HBA), UTSC

JURISDICTIONAL INFORMATION:

The UTSC 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 5.5 of the *AAC Terms of Reference*, the Committee recommends for approval, "new undergraduate programs within an existing degree, as defined in the *University of Toronto Quality Assurance Process*, and the closure of such programs." The Committee on Academic Policy and Programs approves new undergraduate programs within an existing degree, as defined by the *University of Toronto Quality Assurance Process* (*AP&P Terms of Reference*, Section 4.4.b.i.).

GOVERNANCE PATH:

1. **UTSC Academic Affairs Committee [For Recommendation]: May 7, 2025**
2. Committee on Academic Policy and Programs [For Approval]: May 13, 2025

PREVIOUS ACTION TAKEN:

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

HIGHLIGHTS:

The University of Toronto Scarborough (UTSC) is proposing a new undergraduate Major in Climate Change Studies, offered by the Department of Physical and Environmental Sciences, leading to an

Honours Bachelor of Arts (HBA). This social science-focused Major aims to equip students with the knowledge and skills to understand and address various aspects of climate change, including its social, economic, political, and ecological dimensions. Open to students from diverse disciplines, the program will feature theory-based courses, research methods training, and experiential learning opportunities, providing a robust foundation in both the human and physical science aspects of climate change.

The program will include courses in interdisciplinary environmental studies and environmental sciences, as well as related courses in politics and other social sciences. Students will have the flexibility to focus on aspects of climate change that align with their interests and career goals through elective courses. They will also receive training in research methods and engage in experiential learning opportunities. The development of this program leverages the expertise of the Department of Physical and Environmental Sciences' faculty, particularly in transdisciplinary climate adaptation and mitigation research, community-based research, and environmental decision analysis.

An external appraisal of the proposed Major was conducted, including a virtual site visit on March 24 and 25, 2025, by Dr. Jeff Birchall (University of Alberta), Dr. Christine Kirchhoff (Pennsylvania State University), and Dr. Erika Weinthal (Duke University). The reviewers expressed support for the creation of the Major, highlighting the Department's strength in offering opportunities for interdisciplinary engagement. They emphasized the importance of developing students who understand the economic, social, and political dimensions of climate change and who can become effective problem solvers. The reviewers confirmed that existing core faculty could staff the Major program, given the number of elective courses offered by other UTSC departments. However, they encouraged the Department to bolster support for its administrative and technical staff to ensure the continued growth of this program and the Department's other existing programs in the long term. They also noted the opportunity for the Department to facilitate interdisciplinary collaboration with other UTSC academic units and to better distinguish its current program offerings for students.

In response, the Department has stated its intention to work with the Office of the Vice-Principal Academic and Dean to discuss staffing and faculty hiring needs as the program grows, considering the current fiscal climate. The Office of the Vice-Principal Academic and Dean has also expressed interest in working with the Department to launch an advisory committee aimed at facilitating discussions and consultations on interdisciplinary curriculum matters, with the goal of enhancing the student experience.

Extensive consultation has taken place in the development of this new program proposal. The Department of Physical and Environmental Sciences has consulted with stakeholders within their department, the Departments of Political Science and Human Geography, all UTSC departments with elective courses included in the program, as well as the Centre for Teaching and Learning, the Department of Community Partnerships and Engagement, and the Integrated Experience Learning team. Additionally, consultations have been held with colleagues from the Faculty of Arts & Science, the University of Toronto Mississauga, the John H. Daniels Faculty of Architecture, Landscape and Design, and the Faculty of Applied Science and Engineering. The proposal has also been reviewed by the Provost's Advisory Group and the Office of the Vice-Provost, Academic Programs.

FINANCIAL IMPLICATIONS:

There are no net implications to the campus operating budget.

RECOMMENDATION:

Be It Recommended:

THAT the new Major in Climate Change Studies, which will confer the existing HBA degree, in the Department of Physical and Environmental Sciences, UTSC as described in the attached proposal, be approved effective September 1, 2025.

DOCUMENTATION PROVIDED:

1. New Undergraduate Program Proposal Package, Major in Climate Change Studies, which contains:
    a. New Program Review Report (with the site visit schedule appended), dated April 22, 2025
    b. Program's (Professor George Arhonditsis) Response, dated April 22, 2025
    c. Acting Dean's (Professor Katherine R. Larson) Response, dated April 28, 2025
    d. Vice-Provost, Academic Programs' (Professor Nicholas Rule) Response, dated May 1, 2025
    e. New Undergraduate Program Proposal, Major in Climate Change Studies, dated April 28, 2025

External Reviewers' Report (April 22, 2025)

New Program Review Report: Major in Climate Change Studies

Framework for UTQAP Reviews

University of Toronto Quality Assurance (UTQAP) processes support a structured approach for creating, reflecting on, assessing and developing plans to change and improve academic programs and units in the context of institutional and divisional commitments and priorities.

The University of Toronto (U of T), in its Statement of Institutional Purpose (1992), articulates its mission as a commitment "to being an internationally significant research university, with undergraduate, graduate, and professional programs of excellent quality." Thus “quality assurance through assessment of new program proposals and review of academic programs and units in which they reside is a priority for the University…:

> The quality of the scholarship of the faculty, and the degree to which that scholarship is brought to bear in teaching are the foundations of academic excellence. More generally, all of the factors that contribute to collegial and scholarly life —academic and administrative complement, research and scholarly activity, infrastructure, governance, etc.—bear on the quality of academic programs and the broad educational experience of students. (*Policy for Approval and Review of Academic Programs and Units* (2010))

The University’s approach to quality assurance is built on two primary indicators of academic excellence: the quality of the scholarship and research of faculty; and the success with which that scholarship and research is brought to bear on the achievement of Degree Level Expectations.

These indicators are assessed by determining how our scholarship, research and programs compare to those of our international peer institutions and how well our programs meet their Degree Level Expectations.

Program(s) under review:	*Major in Climate Change Studies*
Commissioning officer:	*Professor Karin Ruhlandt* *Vice-Principal Academic & Dean*
Date of scheduled review:	*March 24-25, 2025*
Reviewers' names and affiliations:	● *Jeff Birchall, Associate Professor and Director, Climate Adaptation and Resilience Lab, Department of Earth and Atmospheric Sciences, University of Alberta* ● *Christine Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University* ● *Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems, Nicholas School of the Environment, Duke University*

New Program Review Report

Please provide a joint Report evaluating the standards and quality of the proposed program.

- Respect the confidentiality required for all aspects of the review process.
- Append the site visit schedule to the report.

Note: Issues that are addressed through existing, specific University procedures are considered **out of scope** for UTQAP reviews (e.g., individual Human Resources issues, specific health and safety concerns). **Any such issues raised at any point during a review process** (site visit, review report) **must immediately be brought to the attention of the commissioning officer and routed through appropriate University channels for resolution**.

A. Summary

Reviewers are asked to:

- Address the substance of the New Program Proposal.
- Comment on the adequacy of existing physical, human and financial resources, based in part on the external reviewers' assessment of the faculty members' education, background, competence and expertise as evidenced in their CVs.
- Acknowledge any clearly innovative aspects of the proposed program together with recommendations on any essential or otherwise desirable modifications to it.

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1. Feedback from current students suggest interest in the program, including specifically the knowledge and skills that this program offers.
2. The open enrollment and structure of the program is likely to drive strong enrollment, but this may decrease interest in other majors (e.g., environmental studies).
3. The proposed major offers a range of required/ option courses designed to allow breadth and/or depth of understanding on different aspects of climate change studies. Students can curate courses based on their academic interests and career goals. However, greater attention to social science research methods and climate change policy is recommended to better prepare students for next steps beyond their undergraduate degree.
4. While core faculty are prepared, well qualified, and enthusiastic to support the proposed program, administrative and technical staff within the department exhibit signs of significant strain.

B. Recommendations

Please endeavour to distinguish between observations or suggestions (which can be included in "Findings") and formal recommendations (which should be included here). **The Dean and unit/program will be required to provide a public response to every recommendation listed in this section.**

1. Overall, the review committee is supportive of the creation of a new Major in Climate Changes Studies within the Department of Physical and Environmental Sciences (DPES) at the University of Toronto, Scarborough. The program identifies climate change as a priority for the university and provides for interdisciplinary engagement, a strength of DPES. However, because support staff are already under duress, strengthening their capacity is essential to ensure success of the new major as well as to sustain the vitality of other programs.
2. It appears that the administrative and technical staff in DPES are already at capacity/nearing burnout, and additional loading may put these staff and facilities at their breaking point. Staff support for new and ongoing programs should be prioritized to ensure students in these programs have positive experiences and that new and existing programs continue to grow. The program, especially in its early stage, could be compromised if there is not sufficient staff support which may diminish students' positive experiences.
    a. Future program development should consider greater investment in understanding implications for staff support of the new program to ensure continued positive experiences of students and student success.
3. Include coursework around methods/social science research. A strong grounding in research methods helps prepare students for graduate school, which is noted in the proposal as a career pathway. At present the proposed program does not include a research methods course. While a self-directed/ independent study course ("Research Project in Environmental Science") does exist, it is difficult to assess the rigor/ impact of the course given that the course description is very brief (and open ended).
4. Include a required course on climate change policy development, interpretation and evaluation/ analysis. More strengths in climate change policy will help better prepare students for industry, government, and related careers. Some of this need is met indirectly through required courses associated with the proposed program (e.g., ESTB04H3) and options (e.g., GGRC26H3, POLC53H3). ESTD20H3 does go some way to

address the issue, however the course is an option, and is currently classed a new course (for F2025), and as such the course outline is very limited in scope. Ultimately, it would be beneficial to include a dedicated required course on this subject given the role/ importance of policy with respect to climate change discourse and action.

5. Make clearer how the program learning outcomes will be formally assessed and consider re-writing the program learning objectives to facilitate their measurement. Current program level objectives include "to prepare", "to provide", "to introduce", and "to establish" but it is not clear what students will know or be able to do once they complete the program. Program learning objectives should establish these expectations and program directors should establish means to measure these objectives.
6. There may be a benefit to having a cross-departmental coordinating committee to ensure ongoing buy-in and coordination among different units in the university. Given that the program depends on courses from other departments, especially for elective courses, the program might benefit from having a coordinating committee/advisory committee that meets at least once a year or once a semester to ensure that courses are coordinated and also to identify other opportunities for student enrichment.
7. Better market differences between environmental and climate change studies majors.

C. Program Evaluation Criteria

Please provide commentary on the following evaluation criteria. In some cases, it may be preferable to address multiple criteria holistically. In such cases, please clarify which criteria are relevant to the comments.

1 Academic rationale and program objectives

a) Clarity of the program's objectives.
b) Appropriateness of degree or diploma nomenclature given the program's objectives.
c) Consistency of the program's objectives with the institution's mission and the University of Toronto's/the division's/unit's academic plans, priorities and commitments, including consistency with any implementation plans developed following a previous review.
d) Evidence that the following have been substantially considered in the development of the program and its associated resources:
    1. Universal design principles and/or the potential need to provide mental or physical disability-related accommodations, reflecting the University's Statement of Commitment Regarding Persons with Disabilities

2. Support for student well-being and sense of community in the learning and teaching environment, reflecting the work of the Expert Panel on Undergraduate Student Educational Experience and the commitment to establishing a Culture of Caring and Excellence as recommended by the Presidential and Provostial Task Force on Student Mental Health
3. Opportunities for removing barriers to access and increasing retention rates for Indigenous students; for integrating Indigenous content into the curriculum in consultation with Indigenous curriculum developers; and for addressing any discipline-specific calls to action, reflecting the commitments made in Answering the Call: Wecheehetowin: Final Report of the Steering Committee for the University of Toronto Response to the Truth and Reconciliation Commission of Canada (PDF)
4. Opportunities for removing barriers to access and increasing retention rates for Black students; for promoting intersectional Black flourishing, fostering inclusive excellence and enabling mutuality in teaching and learning, reflecting the commitments made in the Scarborough Charter and consistent with the recommendations of the Anti-Black Racism Task Force Final Report
5. Opportunities for fostering an equitable, diverse and inclusive teaching and learning environment, reflecting the values articulated in existing institutional documents such as the Statement on Equity, Diversity, and Excellence, the Antisemitism Working Group Final Report, the aforementioned reports, and future institutional reports related to equity, diversity and inclusion.

e) Unique curriculum or program innovations, creative components, significant high-impact practices, where appropriate.

The academic rationale for the program is straightforward –to prepare “students for a future in a climate-changed world.” There is no doubt there will be a need for students who understand the economic, social, and political dimensions of climate change regarding underlying drivers and impacts, but more so to attain the tools to become problem solvers. The program also aims to ensure that students receive science/climate literacy with the core classes. However, while the rationale and need are clear, the program learning objectives are not measurable as written. Program learning objectives should make clear what students will know or be able to do once they complete the program and program directors should establish means to measure these objectives.

The program is designed to fit the university's mission of advancing more interdisciplinary programs that allow for students to build different combinations of co-majors. The program is distinctive in that it centers climate change and the social sciences within a program that has taught environmental sciences. The range of courses that include attention to Indigenous peoples, environmental justice, and food will reach a diverse range of students.

The proposal clearly addresses student services such as health, wellness and accessibility (can be received via AccessAbility Services and Health and Wellness Services), and demonstrates an awareness of the importance of equity and universal design principles to support students' capacities and learning experiences. The language in the proposal reflects the substance and spirit of key institutional reports like the UofT Statement on Equity, Diversity and Excellence. Course content also reflects these values and skills, as does faculty and staff (based on meetings held throughout the review visit).

2 Program Requirements

a) Appropriateness of the program's structure and the requirements to meet its objectives and program-level learning outcomes, including the structure and requirements of any identified streams (undergraduate), fields or concentrations (graduate).
b) Appropriateness of the program's structure, requirements and program-level learning outcomes in meeting the institution's applicable undergraduate or graduate Degree Level Expectations.
c) Appropriateness of the proposed mode(s) of delivery (i.e., means or medium used in delivering a program; e.g., lecture format, distance, online, synchronous/asynchronous, problem-based, compressed part-time, flexible-time, multi-campus, inter-institutional collaboration or other non-standard forms of delivery) to facilitate students' successful completion of the program-level learning outcomes.
d) Ways in which the curriculum addresses the current state of the discipline or area of study and is appropriate for the level of the program.

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1. The proposed program is designed around key environmental studies courses, with electives intended to provide further specialization. This is achieved through three phases: foundation courses, core courses and application/ skills courses. The former focuses on social, economic, political and ecological aspects of climate change. Core courses build and hone skills related to scientific literacy on climate change and provide attention to teamwork and professional soft skills. The final phase allows students to be more prescriptive and select courses based on their interests.

2. The proposed program is designed to be delivered in person. As articulated, this is important given the value placed on peer-to-peer learning/ engagement. Experiential learning is also a key component of the proposed program (including through partnerships with outside organizations), and this often benefits from being on campus. Courses will be delivered in the Environmental Science and Chemistry building. While we were not able to see the building/ classrooms (due to virtual site assessment), we understand that the building is fully accessible.
3. The proposed program does address the current state of the discipline of climate change/ environmental studies. The program is designed to foster development of skills/ knowledge across disciplines related to climate change, including social, economic, ecological, and political perspectives, all to prepare students to play meaningful roles in responding to the climate crisis. Courses are distributed across junior to senior levels of study in an effective manner.
4. The program learning objectives are not measurable as written. Program learning objectives should make clear what students will actually know or be able to do once they complete the program and program directors should establish means to measure these objectives.

3 Admission Requirements

a) Appropriateness of the program's admission requirements given the program's objectives and program-level learning outcomes.
b) Sufficient explanation of alternative requirements, if applicable, for admission into a graduate, second-entry or undergraduate program, e.g., minimum grade point average, additional languages or portfolios and how the program recognizes prior work or learning experience.

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1. The proposed major does not have admission requirements, beyond the UTSC requirement that students can only enter the program following their first year of study.

4 Assessment of Teaching and Learning

a) Appropriateness of the methods for assessing student achievement of the program-level learning outcomes and degree level expectations.
b) Appropriateness of the plans to monitor and assess:
    1. The overall quality of the program
    2. Whether the program is achieving in practice its proposed objectives

3. Whether its students are achieving the program-level learning outcomes
4. How the resulting information will be documented and subsequently used to inform continuous program improvement.

Course outlines associated with the proposal include an adequate level of detail regarding how students will be assessed. Given the different levels (A-level to D-level), and course delivery styles (from lecture to self-directed), the various methods of assessment seem appropriate. Courses include typical tests/ exams, participation, essays and reports, as well as reflexive journals. A capstone course includes a more one-on-one approach to assessment. Table 4 in the proposal provides a thorough overview of assessment methods.

According to the proposal, DPES has practices in place to ensure student success, including a committee (of DPES faculty) that will monitor graduation rates and attrition numbers in the program. The report also notes that the committee will 'build evaluation of partner experiences into experiential learning in courses, where faculty will elicit feedback from partners', however this process and who the partners are should be clearer. And, as mentioned previously, the program learning objectives are not measurable as written. Program learning objectives should make clear what students will actually know or be able to do once they complete the program and program directors should establish means to measure these objectives.

5 Resources

Given the program's planned/anticipated class sizes and cohorts as well as its program-level learning outcomes:

a) Participation of a sufficient number and quality of core faculty who are competent to teach and/or supervise in and achieve the goals of the program and foster the appropriate academic environment.
b) If applicable, discussion/explanation of the role and approximate percentage of adjunct and sessional faculty/limited term appointments used in the delivery of the program and the associated plans to ensure the sustainability of the program and quality of the student experience (see QAF Guidance).
c) If required, provision of supervision of experiential learning opportunities
d) Adequacy of the administrative unit's planned utilization of existing human, physical and financial resources, including implications for the impact on other existing programs at the University.

e) Evidence that there are adequate resources to sustain the quality of scholarship and research activities produced by students, including library support, information technology support and laboratory access.
f) If necessary, additional institutional or divisional resource commitments to support the program in step with its ongoing implementation.

The program will have sufficient core faculty to staff the program, as many of the elective courses come from other units within the university. Thus, as long as other units are offering classes, the program should be able to sustain the core. The possibility of potentially hiring additional faculty through a Canada Research Chair (CRC) will be important for growing and sustaining the program and other programs within the Department.

Where the program may be short on resources is the staff capacity to ensure that students' needs are met, especially when it comes to the day-to-day management of the undergraduate program. There seems to be increasing uncertainty regarding the division of labor between the Academic Advising & Career Centre and departmental faculty and staff concerning advising issues such as finding course replacements and making sure that students are checking all the boxes for graduation. Existing staff are already stretched and approaching a breaking point. Clarity in roles and additional support staff capacity is urgently needed.

From the perspective of the library and registrar, there were no concerns about additional resources being required. There could be better clarification regarding the extent to which the new program will require use of the environmental science labs and staff.

6 Quality and Other Indicators

a) Evidence of the quality of the faculty (e.g., qualifications, funding, honours, awards, research, innovation and scholarly record; appropriateness of collective faculty expertise to contribute substantively to the program and commitment to student mentoring)
    1. The quality of the scholarship of the faculty, and the degree to which that scholarship is brought to bear in teaching.
b) Any other evidence that the program and faculty will ensure the intellectual quality of the student experience.
c) Any additional indicators of quality identified by the division or academic unit.
d) How the proposed program compares to the best in its field among international peer institutions.

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1. Core faculty associated with the proposed program are well qualified, and demonstrate expertise in environmental studies/science, and in their respective sub specialities of climate change studies/science. Courses associated with the proposed program will be delivered by faculty with expertise, and in many cases research experience, related to course objectives/content.
2. DPES is well situated to host the proposed program. The department runs similar programs (e.g., environmental studies major) and includes faculty who are international leaders on climate change studies/ science, including two tenure-stream faculty (Klenk and Tozer), who are both highly productive academics (publishing in *Nature Sustainability*, *Nature Climate Change*, *Global Environmental Change*; and play key editorial roles with *Environmental Science and Policy*).
3. The proposed program emphasizes the social/human dimensions of climate change and therefore sets itself apart from domestic (e.g., University of Waterloo, Trent University) and international programs (e.g., MIT) which tend to focus on physical aspects of climate change. A strength of the proposed program is the emphasis on interdisciplinary approaches to understanding climate change. Other programs do emphasize a social science perspective (e.g., UBC, UC Berkeley), however tend to focus on sustainability or environmental issues more broadly.

7 Commissioning Officer Acceptance

After receiving the report from the reviewers, the commissioning officer formally accepts the final report and fills in the table below.

<table>
<tr><td colspan="2">As Commissioning Officer, I confirm that:
✓ The New Program Proposal and all relevant faculty CVs were provided to the reviewers to support their assessment of the new program.
✓ The Report addresses the program evaluation criteria, as required by the UTQAP.
✓ I have brought to the attention of the reviewers any clear factual errors in the report and the reviewers have corrected these.
✓ I have brought to the attention of the reviewers any omitted UTQAP requirements.
✓ I have attached the site visit schedule to the report.</td></tr>
<tr><td>Commissioning Officer*: Jessica Fields,
Acting Vice-Principal Academic and Dean</td><td>Report Accepted as Final on
April 22, 2025</td></tr>
</table>

UNIVERSITY OF TORONTO SCARBOROUGH

Office of the Vice-Principal Academic & Dean

VIRTUAL EXTERNAL REVIEW SCHEDULE

Major Program in Climate Change Studies
Department of Physical and Environmental Sciences
University of Toronto Scarborough
1265 Military Trail
Toronto, ON M1C 1A4

Review Team (alphabetical order based on last name):

- Dr. Jeff Birchall, Associate Professor, Department of Earth and Atmospheric Sciences, University of Alberta
- Dr. Christine J. Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University
- Dr. Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems Division, Duke University

Virtual External Review Dates:

- Monday, March 24, 2025: 8:50 am - 3:00 pm EDT (6:50 am - 1:00 pm MDT)
- Tuesday, March 25, 2025: 11:30 am - 5:10 pm EDT (9:30 am - 3:10 pm MDT)

Zoom Meeting Details for All Participants:

External Review for the Major Program in Climate Change Studies

- **Join Zoom Meeting:** https://utoronto.zoom.us/j/83711569254
- **Meeting ID:** 837 1156 9254
- No passcode, waiting room enabled

Day 1: Monday, March 24, 2025

TIME EDT (MDT)	DETAILS	LOCATION
8:50 am - 9:10 am EDT (6:50 am - 7:10 am MDT)	**Set up Meeting** • Jeff Birchall, Associate Professor, Department of Earth and Atmospheric Sciences, University of Alberta • Christine J. Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University • Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems Division, Duke University • Kevin Mak, Academic Programs Officer, UTSC • Sarah Chaudhry, Programs and Curriculum Coordinator, UTSC • Lee Bazely, Programs and Curriculum Coordinator, UTSC	Zoom
9:10 am - 10:00 am EDT (7:10 am - 8:00 am MDT)	**Briefing Meeting with Dean and Decanal Team** • Karin Ruhlandt, Vice-Principal, Academic and Dean karin.ruhlandt@utoronto.ca • Katie Larson, Vice-Dean, Teaching, Learning & Undergraduate Programs katie.larson@utoronto.ca • David Zweig, Vice-Dean, Recruitment, Enrolment & Student Success david.zweig@utoronto.ca • Jessica Fields, Vice-Dean, Faculty Affairs, Equity & Success jessica.fields@utoronto.ca • Lynn Tucker, Associate Dean, Experiential and Global Learning lynn.tucker@utoronto.ca • Karen McCrindle, Associate Dean, Teaching and Learning k.mccrindle@utoronto.ca • Maggie Cummings, Special Advisor for Academic Programming & Curriculum Development maggie.cummings@utoronto.ca • Zahra Bhanji, Assistant Dean zahra.bhanji@utoronto.ca • Kevin Mak, Academic Programs Officer kevin.mak@utoronto.ca	Zoom
10:10 am - 11:00 am EDT (8:10 am - 9:00 am MDT)	**Meeting with the Chair, Department of Physical and Environmental Sciences, UTSC** • George Arhonditsis, Professor and Chair, Department of Physical and Environmental Sciences george.arhonditsis@utoronto.ca	Zoom
11:00 am - 11:15 am EDT (9:00 am - 9:15 am MDT)	**BREAK**	
11:15 am - 12:00 pm EDT	**Meeting with the Library, UTSC**	Zoom

TIME EDT (MDT)	DETAILS	LOCATION
(9:15 am - 10:00 am MDT)	• Mariana Jardim, Liaison Librarian, Department of Physical and Environmental Sciences mariana.jardim@utoronto.ca	
12:00 pm - 1:00 pm EDT (10:00 am - 11:00 am MDT)	**LUNCH/BREAK**	
1:10 pm - 2:00 pm EDT (11:10 am - 12:00 pm MDT)	**Meeting with Registrar Office, UTSC** • Shelby Verboven, Registrar & Assistant Dean, Strategic Enrolment Management shelby.verboven@utoronto.ca • Dallas Boyer, Associate Registrar & Director of Student Services dallas.boyer@utoronto.ca • Kyomi Hastings, Associate Registrar & Director of Admissions & Student Recruitment kyomi.hastings@utoronto.ca • Naureen Nazim, Associate Registrar & Director of System & Operation naureen.nizam@utoronto.ca	Zoom
2:10 pm - 3:00 pm EDT (12:10 pm - 1:00 pm MDT)	**Meeting with Administrative Staff, Department of Physical and Environmental Sciences, UTSC** • Aerin Finn, Undergraduate Assistant, Department of Physical and Environmental Sciences aerin.finn@utoronto.ca • Annie Kostadinova, Undergraduate Administrator, Department of Physical and Environmental Sciences a.kostadinova@utoronto.ca • Scott Ballantyne, Senior Manager, Department of Physical and Environmental Sciences scott.ballantyne@utoronto.ca • Joanna Ying-Fiss, Team Lead, External Relations and Career Development, Department of Physical and Environmental Sciences joanna.ying@utoronto.ca	Zoom

Day 2: Tuesday, March 25, 2025

TIME EDT (MDT)	DETAILS	LOCATION
11:30 am - 11:40 am EDT (9:30 am - 9:40 am MDT)	**Set up Meeting** • Jeff Birchall, Associate Professor, Department of Earth and Atmospheric Sciences, University of Alberta • Christine J. Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University • Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems Division, Duke University • Kevin Mak, Academic Programs Officer (UTSC) • Sarah Chaudhry, Programs and Curriculum Coordinator • Lee Bazely, Programs and Curriculum Coordinator	Zoom
11:40 am - 12:30 pm EDT (9:40 am - 10:30 am MDT)	**Meeting with Faculty, Department of Physical and Environmental Sciences, UTSC** • Daniel Bender, Professor, Department of Physical and Environmental Sciences daniel.bender@utoronto.ca • Laura Tozer, Assistant Professor, Department of Physical and Environmental Sciences laura.tozer@utoronto.ca • Carl Mitchell, Professor and Associate Graduate Chair, Department of Physical and Environmental Sciences carl.mitchell@utoronto.ca • James MacLellan, Associate Professor-Teaching Stream, Department of Physical and Environmental Sciences jim.maclellan@utoronto.ca • George Arhonditsis, Professor and Chair, Department of Physical and Environmental Sciences george.arhonditsis@utoronto.ca	Zoom
12:30 pm - 1:30 pm EDT (10:30 am - 11:30 am MDT)	**Student Meeting** • Jeff Birchall, Associate Professor, Department of Earth and Atmospheric Sciences, University of Alberta • Christine J. Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University • Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems Division, Duke University *Students Attending (Name, Year of Study, and Program)* • Jawaad Khan, 3rd Year, Global Environmental Change Specialist • Aasthaa Sawarkar, 3rd year, Environmental science major and a double minor in applied climatology and biology • Bumi Nugraha (Nara), 2nd year, Molecular Biology and Biotechnology Specialist & Environmental Science Major	Zoom

TIME EDT (MDT)	DETAILS	LOCATION
	• Aanya Sharma, 2nd year, Global Environmental Change Specialist • Santara Khalil, 5th year, Biochemistry and Human Biology double major • Rachel Ye, 3rd year, Biochemistry (co-op) and Molecular Biology, Immunology and Disease double major • Tianyue Liu, 1st year, Chemistry Specialist • Elina Shakouri, 1st year, Health Science and Psychology double major • Taylor Reeves, 2nd year, Physics and Astrophysics Specialist	
1:30 pm - 2:30 pm EDT (11:30 am - 12:30 pm MDT)	**LUNCH/BREAK**	
2:30 pm - 3:20 pm EDT (12:30 pm - 1:20 pm MDT)	**Meeting with Technical Staff, Department of Physical and Environmental Sciences, UTSC** • Chai Chen, Teaching Laboratory Technician, Department of Physical and Environmental Sciences chai.chen@utoronto.ca • Tom Meulendyk, Teaching Laboratory Technician, Department of Physical and Environmental Sciences thomas.meulendyk@utoronto.ca • Tony Adamo, TRACES Lab Manager, Department of Physical and Environmental Sciences tony.adamo@utoronto.ca • Raymond Akbar, Technical Operations Manager, Department of Physical and Environmental Sciences raymond.akbar@utoronto.ca • Kelsey Kilgore, Administrative Assistant & Kitchen Coordinator, Department of Physical and Environmental Sciences kelsey.kilgore@utoronto.ca	Zoom
3:30 pm - 4:00 pm EDT (1:30 pm - 2:00 pm MDT)	**Review Team Consult** • Jeff Birchall, Associate Professor, Department of Earth and Atmospheric Sciences, University of Alberta • Christine J. Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University • Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems Division, Duke University	Zoom
4:10 pm - 5:00 pm EDT (2:10 pm - 3:00 pm MDT)	**Debriefing Meeting with Dean and Decanal Team** • Karin Ruhlandt, Vice-Principal, Academic and Dean karin.ruhlandt@utoronto.ca • Katie Larson, Vice-Dean, Teaching, Learning & Undergraduate Programs katie.larson@utoronto.ca • David Zweig, Vice-Dean, Recruitment, Enrolment & Student Success david.zweig@utoronto.ca	Zoom

TIME EDT (MDT)	DETAILS	LOCATION
	• Jessica Fields, Vice-Dean, Faculty Affairs, Equity & Success jessica.fields@utoronto.ca • Lynn Tucker, Associate Dean, Experiential and Global Learning lynn.tucker@utoronto.ca • Karen McCrindle, Associate Dean, Teaching and Learning k.mccrindle@utoronto.ca • Maggie Cummings, Special Advisor for Academic Programming & Curriculum Development maggie.cummings@utoronto.ca • Zahra Bhanji, Assistant Dean zahra.bhanji@utoronto.ca • Kevin Mak, Academic Programs Officer kevin.mak@utoronto.ca	
5:00 pm - 5:10 pm EDT (3:00 pm - 3:10 pm MDT)	**Wrap Up Meeting** • Jeff Birchall, Associate Professor, Department of Earth and Atmospheric Sciences, University of Alberta • Christine J. Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University • Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems Division, Duke University • Sarah Chaudhry, Programs and Curriculum Coordinator, UTSC • Lee Bazely, Programs and Curriculum Coordinator, UTSC (optional)	Zoom

Program's Response (April 22, 2025)

UNIVERSITY OF TORONTO SCARBOROUGH | PHYSICAL & ENVIRONMENTAL SCIENCES

April 22, 2025

Professor Jessica Fields
Acting Vice-Principal Academic & Dean
Office of the Vice-Principal Academic & Dean
University of Toronto Scarborough

Chair's Administrative Response: New Program Appraisal for the Major in Climate Change Studies

Dear Acting Dean Fields,

I am pleased to provide the departmental administrative response to the external review of our proposed new Major in Climate Change Studies.

On behalf of the Department of Physical and Environmental Sciences (DPES), I thank the reviewers: Dr. Jeff Birchall, Associate Professor and Director, Climate Adaptation and Resilience Lab, Department of Earth and Atmospheric Sciences, University of Alberta; Dr. Christine Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University; and Dr. Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems, Nicholas School of the Environment, Duke University, who were commissioned to conduct an external review of the program. A virtual site visit was held on March 24 and 25, 2025, during which the reviewers met with academic leadership, faculty and staff affiliated with the proposed program, current students, as well as library and registration services at the University of Toronto Scarborough. The reviewers submitted their final report on April 22, 2025.

In their report, the reviewers expressed support for the creation of the proposed Major, noting our department's strength in offering opportunities for interdisciplinary engagement. They also underscored the importance of developing students "who understand the economic, social, and political dimensions of climate change… to attain the tools to become problem solvers." The reviewers further highlighted that the program is designed to fit the University's mission of advancing more interdisciplinary programs that allow students to build different combinations of double majors. The program is distinctive in that it centers climate change and the social sciences within a program that has taught environmental sciences. The range of courses that include attention to Indigenous Peoples, environmental justice, and food will reach a diverse range of students.

I am pleased that the reviewers are supportive of the proposed Major and am appreciative of their recommendations aimed at encouraging us to bolster support for our department's administrative and technical staff to ensure the continued growth of this program and our other existing programs in the long term. In preparing this response, I have consulted with our core Environmental Studies/Climate Change Studies faculty members (Professors Laura Tozer, Nicole Klenk, Jim McLellan), as well as the departmental Teaching and Curriculum committee, supervised by our Associate Chair Undergraduate, Professor Shadi Dalili. We all enthusiastically agree that our ever-growing graduate and undergraduate enterprises create a palpable

excitement and a taste for expansion of our research and teaching activities. Capitalizing upon our strengths and taking advantage of the excellent infrastructure, the Department aspires to become one of the most prominent academic units within the University of Toronto system. The tremendous success of our Environmental Studies program is founded upon an academically rigorous curriculum, rich in experiential learning opportunities, and tightly linked with the workforce (industry, government, non-profit organizations). The tangible deliverables from this design set an "academic model" that we aspire to implement to the Major in Climate Change Studies. Our highly decorated faculty galvanize the DPES academic programs with numerous experiential learning activities and actively pioneer many pedagogical developments. Building upon these two pillars, we are confident that we have both the knowledge and clear vision to put in place a highly sought-after program that can catalyze the transition of our students to successful careers.

Program Objectives and Assessment of Teaching and Learning

While the reviewers felt that the academic rationale for our program is straightforward and the need for this program is clear, they expressed concerns with the way the program objectives and program learning outcomes had been laid out, as well as how students' experiential learning in courses would be evaluated by partners. Specifically, the reviewers made the following statements and recommendations:

- "The program learning objectives are not measurable as written."
- "Program learning objectives should make clear what students will know or be able to do once they complete the program and program directors should establish means to measure these objectives."
- "Make clearer how the program learning outcomes will be formally assessed and consider re-writing the program learning objectives to facilitate their measurement."
- "According to the proposal, DPES has practices in place to ensure student success, including a committee (of DPES faculty) that will monitor graduation rates and attrition numbers in the program. The report also notes that the committee will 'build evaluation of partner experiences into experiential learning in courses, where faculty will elicit feedback from partners', however this process and who the partners are should be clearer."

We greatly appreciate these recommendations from the reviewers. It may be helpful to clarify that our program objectives are designed to provide clear and concise statements that describe the **broad goals** of the program. With regard to the program learning outcomes, we note that in section 7.2 of the proposal (Rationale for the Program Structure), under the subsection 'How the Program Supports its Objectives and Learning Outcomes' (see pages 32-38), the proposal details how a student successfully completing the program's courses will have met all of the program learning outcomes. We therefore feel confident that students will understand the paths available to them once they complete the program. In addition, in section 8 (Assessment) of the proposal (see pages 39-43), under the subsection 'Ongoing Program Monitoring and Assessment' (see pages 42-43), we have described how we will monitor student success relative to the program objectives and program learning outcomes, including through graduation rates, attrition numbers, course evaluations, and the cyclical review process. In response to these recommendations, we have revised section 3 of the proposal to add a clear statement defining program objectives and point readers to sections 7 and 8 of the proposal for the discussion of program learning outcomes and assessments (see page 10 of the proposal).

We also thank the reviewers for their comments regarding students' experiential learning in courses. Our intention is that, in addition to having faculty members in our department meet annually to assess the Major, instructors of courses such as EESD17Y3/ ESTD17Y3 Cohort Capstone Course in Environmental Studies,

ESTB04H3 Addressing the Climate Crisis, and ESTC37H3 Energy and Sustainability, with assistance from the department's External Relations and Career Development team, will meet regularly with the supervisors of these experiential learning opportunities from our partner organizations to discuss students' performance and engagement. This past academic year, our partner organizations included Metrolinx, Climate Secretariat of New Brunswick, Canadian Forestry Service, World Wildlife Fund, Eastern Charlotte Waterways Inc., Toronto Regional Conservation Authority, Canadian Rivers Institute, International Centre for Integrated Mountain Development (Nepal), Réseau inondations intersectoriel du Québec, Bay of Quinte Remedial Action Plan, and the Ontario Ministry of the Environment, Conservation, and Parks.

Program Requirements

In the review report, the reviewers inquired about the inclusion of climate-related policy development in the proposed Major's curriculum. Specifically, they made the following recommendations for the Applications and Skills component/requirement of the Major:

- "Include coursework around methods/social science research… (to help)… prepare students for graduate school…as a career pathway."
- "Include a required course on climate change policy development, interpretation and evaluation/ analysis… (to)… better prepare students for industry, government, and related careers" and "given the role/importance of policy with respect to climate change discourse and action."

We thank the reviewers for these recommendations and can confirm that the required course, EESD17Y3/ESTD17Y3 Cohort Capstone Course in Environmental Studies, does provide a solid grounding in methods and social science research. It meets several program learning outcomes (PLO7, PLO4) by having students work in a group as researchers on an applied environmental challenge.

As for climate policy education, we are proud to highlight that ESTC37H3 Energy and Sustainability, a required course for the proposed Major, also has a policy focus, which is scaffolded to build on the introduction to climate policy in ESTB04H3 Addressing the Climate Crisis to introduce more skills in evaluation and analysis. In addition, the required course ESTC36H3 Knowledge, Ethics and Environmental Decision-Making also focuses on current environmental problems, including climate change, and encourages critical analysis of their root causes and examines decision-making approaches. Furthermore, ESTD20H3 Integrated Natural Resource and Climate Change Governance continues to build even more focus on this area.

There are thus no changes to the proposal resulting from these recommendations.

Faculty, Staff, and Lab Resources

The reviewers confirmed that existing core faculty could staff the program given the number of elective courses that are offered by other departments of the University of Toronto Scarborough. However, they expressed concerns about our current administrative and technical staff complement. The reviewers made the following recommendations and statements:

- "The possibility of potentially hiring additional faculty through a Canada Research Chair (CRC) will be important for growing and sustaining the program and other programs within the Department."

- "Because support staff are already under duress, strengthening their capacity is essential to ensure success of the new major as well as to sustain the vitality of other programs."
- "It appears that the administrative and technical staff in DPES are already at capacity/nearing burnout, and additional loading may put these staff and facilities at their breaking point."
- "Staff support for new and ongoing programs should be prioritized to ensure students in these programs have positive experiences and that new and existing programs continue to grow."
- "Future program development should consider greater investment in understanding implications for staff support of the new program to ensure continued positive experiences of students and student success."
- "There seems to be increasing uncertainty regarding the division of labor between the Academic Advising & Career Centre and departmental faculty and staff concerning advising issues such as finding course replacements and making sure that students are checking all the boxes for graduation. Existing staff are already stretched and approaching a breaking point. Clarity in roles and additional support staff capacity is urgently needed."
- "There could be better clarification regarding the extent to which the new program will require use of the environmental science labs and staff."

We agree with the reviewers' assessment that additional faculty hiring will assist our department in growing the Major as well as our other existing programs in the long term. Given the difficult budget situation over the past two years, we look forward to working with the Dean's Office to explore ideas regarding faculty hires. The interdisciplinary nature of the proposed program provides a unique opportunity as well to consider cross-departmental contributions from new faculty, a possibility that initiatives like the CRC are well positioned to support. The Department has also submitted a proposal for one of the 8 CERC NEST (Network for Equity in Sustainability Transitions) faculty lines that UTSC has committed to. This is currently in process. The CERC NEST initiative, on which Professor Laura Tozer serves as a core faculty member, is well-positioned to contribute to the new Major in Climate Change Studies.

We also appreciate the reviewers' recommendations about staff resources and take our departmental staff's wellbeing seriously. For reasons of staff turnover and positions being vacant, we have had temporary staff workload issues. Happily, these are being addressed by hiring backfill positions and the imminent return of a colleague who has been on leave. These issues will be resolved ahead of the program launch. We also value our collaboration with the campus's Academic Advising & Career Centre, where advisors offer appointments and workshops focusing on study skills, career strategy, and professional and graduate school applications, as well as more general advisory support for students, rather than program-specific advising, which is offered through the department. The job description of our Manager, Academic Program Administration, has also been recently updated to include more specific responsibility for advising needs.

Regarding the new program's required use of environmental science labs and staff, we can confirm that aside from EESA01H3 Introduction to Environmental Science and EESD10Y3 Research Project in Environmental Science (if taken by students as an elective), which use laboratories to provide hands-on field and lab-related practical experience, the use of environmental science labs and staff will be limited for the Major.

There are thus no changes to the proposal resulting from these recommendations.

Cross-departmental Coordination and Student Wayfinding

The reviewers noted that our emphasis on interdisciplinary approaches to understanding climate change through social/human dimensions is a strength of the proposed program. This presents an opportunity for interdisciplinary collaboration and to better distinguish our current program offerings for students. The reviewers made the following recommendations and statements:

- "The program might benefit from having a coordinating committee/advisory committee that meets at least once a year or once a semester to ensure that courses are coordinated and also to identify other opportunities for student enrichment."
- "Better market differences between environmental and climate change studies majors."

We appreciate the reviewers' suggestion of establishing an interdisciplinary advisory committee for the program and are hopeful that, with the support of the Dean's Office, such a committee could be formed to facilitate discussions and consultations. In fact, two humanities departments (Philosophy, and History and Cultural Studies) have recently expressed interest in the possibility of listing some of their courses as elective options in our program. As a result, we look forward to engaging in further dialogue with our UTSC colleagues to identify opportunities for collaboration and coordination.

Regarding the reviewers' suggestion to better market the differences between environmental and climate change studies programs, we agree that more needs to be done from a marketing and communications perspective to better inform students of our offerings. We look forward to working with the Dean's Office to think more deeply about how best to promote our different programs to various students.

Therefore, there are no changes to the proposal resulting from these recommendations.

On behalf of the Department, I thank the reviewers for their thoughtful recommendations and guidance as this program moves forward. We will continue to monitor the curriculum and work with the Dean's Office to ensure students are well-prepared to progress in the program.

Sincerely,

George Arhonditsis
Professor and Chair
Physical and Environmental Sciences
University of Toronto Scarborough

Dean’s Response (April 28, 2025)

UNIVERSITY OF TORONTO SCARBOROUGH

Office of the Vice-Principal Academic and Dean

April 28, 2025

Professor Nicholas Rule
Vice-Provost, Academic Programs
Office of the Vice-Provost, Academic Programs
Division of the Vice-President & Provost
University of Toronto

Dean's Administrative Response: New Program Appraisal for the Major in Climate Change Studies

Dear Professor Rule,

I am pleased to provide the decanal administrative response to the external review of our proposed new Major in Climate Change Studies.

On behalf of the University of Toronto Scarborough (UTSC) and the Department of Physical and Environmental Sciences, I thank the reviewers: Dr. Jeff Birchall, Associate Professor and Director, Climate Adaptation and Resilience Lab, Department of Earth and Atmospheric Sciences, University of Alberta; Dr. Christine Kirchhoff, Associate Professor and Associate Director of Law, Policy and Engineering, and Associate Professor of Civil and Environmental Engineering, Pennsylvania State University; and Dr. Erika Weinthal, John O. Blackburn Distinguished Professor of Environmental Policy, and Chair, Environmental Social Systems, Nicholas School of the Environment, Duke University, for conducting an external review of the Major program in Climate Change Studies. A virtual site visit was held on March 24 and 25, 2025, during which the reviewers met with academic leadership, faculty and staff affiliated with the proposed program, current students, as well as library and registrarial services at UTSC.

In their report submitted on April 22, 2025, the reviewers expressed support for the creation of the proposed Major, noting the Department's strength in offering opportunities for interdisciplinary engagement. They also underscored the importance of developing students "who understand the economic, social, and political dimensions of climate change… to attain the tools to become problem solvers."

I am gratified to know that the reviewers support the proposed Major and that they showed a forward-looking perspective in their recommendations, noting the long-term needs of the program. In preparing the response below, my office requested an administrative response to the review from Professor George Arhonditsis, Chair of the Department of Physical and Environmental Sciences at UTSC. Professor Arhonditsis's letter to Acting Dean Fields dated April 22, 2025, outlined the reviewers' recommendations and potential responses. My response below is informed by Professor Arhonditsis's letter.

Program Objectives and Assessment of Teaching and Learning

The reviewers felt that the academic rationale for the program is straightforward and the need for this program is clear. However, they expressed concerns that the program objectives and program learning outcomes are not measurable as written and that these should be re-written to better facilitate their measurement:

- "Program learning objectives should make clear what students will know or be able to do once they complete the program and program directors should establish means to measure these objectives."
- "Make clearer how the program learning outcomes will be formally assessed…"
- "According to the proposal, DPES has practices in place to ensure student success, including a committee (of DPES faculty) that will monitor graduation rates and attrition numbers in the program. The report also notes that the committee will 'build evaluation of partner experiences into experiential learning in courses, where faculty will elicit feedback from partners', however this process and who the partners are should be clearer."

The Department has benefited greatly from the reviewers' recommendations. In his administrative response, the Chair highlights that the program objectives are designed to provide clear and concise statements that describe the broad goals of the program. In addition, as the Chair indicates, in section 7.2 under the subsection 'How the Program Supports its Objectives and Learning Outcomes,' the proposal describes how a student successfully completing the program's courses will have met all the program learning objectives. The Chair likewise outlines the Department's approach to monitoring student success in the program in section 8 of the proposal with an eye toward both ensuring completion of the program objectives and continuing to meet the program learning outcomes. In response to the recommendations, clarifying sentences have been added to section 3 of the proposal, to describe the purpose of program objectives and to point readers to sections 7 and 8 of the proposal for the discussion on program learning outcomes and assessments. My office will continue to work with the Department, as the program is established, to monitor program objectives and learning outcomes as well as student success on an ongoing basis, for example through graduation rates, attrition numbers, course evaluations, and the cyclical review process. Faculty are also expected to make learning outcomes of individual courses clear to students and to connect these explicitly to assessment criteria in syllabi.

In response to the reviewers' comments about students' experiential learning in courses, the Department Chair notes the department's intention to have instructors of courses where experiential learning features prominently, such as EESD17Y3/ ESTD17Y3 Cohort Capstone Course in Environmental Studies, ESTB04H3 Addressing the Climate Crisis, and ESTC37H3 Energy and Sustainability, meet regularly with the supervisors of experiential learning opportunities, from our partner organizations, to discuss students' performance and engagement. Additionally, faculty members will meet annually to discuss and assess the program. I support the Department's approach and encourage the Chair to engage in regular dialogue with the Associate Dean Experiential and Global Learning and the campus's Experiential Learning Steering Committee, as well as TeamX, our staff support team for experiential learning at UTSC, to explore and refine strategies over time. This work connects closely to campus-wide enhancement of our experiential learning processes and related supports.

Program Requirements

During the site visit and in the review report, the reviewers inquired about the existence of climate-related policy development in the proposed Major curriculum. Specifically, they made the following recommendations for the Applications and Skills component/requirement of the Major:

- "Include coursework around methods/social science research… (to help)… prepare students for graduate school… as a career pathway."
- "Include a required course on climate change policy development, interpretation and evaluation/ analysis… (to)… better prepare students for industry, government, and related careers" and "given the role/importance of policy with respect to climate change discourse and action."

As the Department Chair noted in his administrative response, the EESD17Y3/ESTD17Y3 Cohort Capstone Course in Environmental Studies requires students to undertake research work on an applied environmental challenge, thereby enabling them to gain proficiency in methods and social science research. It is important to note as well that while research training is a vital foundation for graduate school, as the reviewers note, not all of our students pursue that pathway. The program is designed to integrate research skills with a range of career possibilities in mind. Furthermore, courses such as ESTB04H3 Addressing the Climate Crisis; ESTC36H3 Knowledge, Ethics and Environmental Decision-Making; ESTC37H3 Energy and Sustainability; and ESTD20H3 Integrated Natural Resource and Climate Change Governance introduce and develop students' skills in critical policy evaluation and analysis. There are no changes to the proposal resulting from these recommendations. My office will support the Department in exploring potential future course opportunities related to climate policy that might further leverage cross-departmental contributions to the program.

Faculty, Staff, and Lab Resources

The reviewers confirmed that existing core faculty could staff the Major program given the number of elective courses that are offered by other University of Toronto Scarborough departments. However, they expressed concerns about the Department's current administrative and technical staff complement. The reviewers made the following recommendations and statements:

- "The possibility of potentially hiring additional faculty through a Canada Research Chair (CRC) will be important for growing and sustaining the program and other programs within the Department."
- "Because support staff are already under duress, strengthening their capacity is essential to ensure success of the new major as well as to sustain the vitality of other programs."
- "It appears that the administrative and technical staff in DPES are already at capacity/nearing burnout, and additional loading may put these staff and facilities at their breaking point."
- "Staff support for new and ongoing programs should be prioritized to ensure students in these programs have positive experiences and that new and existing programs continue to grow."
- "Future program development should consider greater investment in understanding implications for staff support of the new program to ensure continued positive experiences of students and student success."
- "There seems to be increasing uncertainty regarding the division of labor between the Academic Advising & Career Centre and departmental faculty and staff concerning advising issues such as finding course replacements and making sure that students are checking all the boxes for graduation. Existing

staff are already stretched and approaching a breaking point. Clarity in roles and additional support staff capacity is urgently needed."

- "There could be better clarification regarding the extent to which the new program will require use of the environmental science labs and staff."

I, along with the Department, agree with the reviewers' assessment that additional faculty hiring, including through avenues such as the possibility of a Canada Research Chair (CRC), will help the Department further grow its Major and other programs. The CERC NEST (Network for Equity in Sustainability Transitions) hiring initiative that is currently underway at UTSC, which will be committing 8 faculty hires in sustainability transitions, holds particular potential for this program. While it is not yet clear which departments the current round of CRC and CERC NEST nominations will connect to, these hiring initiatives are well positioned to contribute to the new Major in Climate Change Studies; CERC NEST speaks explicitly to sustainability concerns. While we are confident the program has the faculty complement it needs for its establishment, we will continue to assess opportunities and review the Department's needs in relation to enrolment growth through the campus's faculty complement planning process as well as through CRC and CERC NEST hiring opportunities.

As for staff resources, the Chair noted in his administrative response that the Department recognizes the toll of the additional workload caused by recent staff turnover on the wellbeing of existing departmental staff. I appreciate the Department's assurance that its temporary staff workload issues will be resolved through hiring backfill positions and the imminent of return of staff who have been on leave ahead of the program launch. The job description of the Department's Manager, Academic Program Administration, has also been recently updated to include more specific responsibility for advising needs. The resolution of these workload issues will allow students to take advantage of program-specific advising through the Department, as well as more holistic advising around academic and career strategies through the campus's Academic Advising & Career Centre. While my office is confident that the Department has the staffing resources they need at this time, we will continue to work with the Department to assess staffing needs as the program grows and in relation to the current fiscal climate.

I thank the reviewers for their comments seeking clarification on the new program's required use of environmental science labs and staff. I agree with the Department Chair's assessment that the use of environmental science labs and staff will be limited for the Major given its social science and interdisciplinary focus.

There are therefore no changes to the proposal resulting from these recommendations.

Cross-departmental Coordination and Student Wayfinding

The reviewers noted that the Department's emphasis on interdisciplinary approaches to understanding climate change through social/human dimensions is a strength of the proposed program. This presents an opportunity for interdisciplinary collaboration and to better distinguish the Department's current program offerings for students. The reviewers made the following recommendations and statements:

- "The program might benefit from having a coordinating committee/advisory committee that meets at least once a year or once a semester to ensure that courses are coordinated and also to identify other opportunities for student enrichment."
- "Better market differences between environmental and climate change studies majors."

As noted by the Department Chair in his administrative response, additional Humanities and Social Sciences units at UTSC have recently expressed interest in listing selected courses as elective options. I welcome this cross-departmental collaboration, which reflects a core priority for UTSC, and appreciate the reviewers' suggestion of an interdisciplinary advisory committee for the program. My office would be happy to work with the Department to launch an advisory committee aimed at facilitating discussions and consultations on interdisciplinary curriculum matters with the goal of enhancing the student experience, which I see as a benefit not only for this particular program but for the campus as a whole.

As the program launches, I encourage the Department to engage in dialogue with the campus's Marketing and Communications team to explore strategies when promoting the different Environmental Studies, Environmental Science, and Climate Change Studies programs to prospective and current students. My office will also work with the Department and with the Academic Advising and Career Centre to prioritize this differentiation as a part of student outreach and advising.

There are therefore no changes to the proposal resulting from these recommendations.

Changes to the Proposal Not Related to the Recommendations of the External Reviewers

In coordination with the Department, we are taking the opportunity provided by the external review to make three modest revisions to the new program proposal (i.e., these changes are not related to the reviewers' recommendations), ahead of submitting it to governance for approval. First, my office received an update from the Department of Management at UTSC, that MGEC65H3 Economics of the Environment and Climate Change, which is an optional course in the program, is no longer being offered on a cycle that will support the completion of the Applications and Skills component/requirement of the Major. As a result, this course has been removed from the program completion requirements as shown in section 6 (Calendar Entry) of the proposal (see page 30), in the narrative regarding how the proposed program supports its objectives and learning outcomes, in section 7.2 (see page 37), in the course listings in Appendix A (see page 68), and in Appendix E, in the table comparing the program requirements between the Environmental Studies Major and the proposed Climate Change Studies Major (see page 127 of the proposal).

Second, the proposal has been updated in section 7.1 (Rationale for Admission Requirements) to clarify that unlimited programs can be selected at any time on ACORN and do not require students to have completed their first 4.0 credits (see page 31).

Third, section 9 (Consultation) of the proposal has been updated to: a) highlight that the Office of the Registrar and the department will continue to work with cognate units offering electives to monitor course availability and any enrolment restrictions to ensure that students enrolled in the new program have access to electives that are connected to it as the program is established (see page 43); and b) to include supplementary consultation with the Office of the Registrar that was undertaken following the external review (see page 44).

I am excited by the overall positive review of the proposed new Major in Climate Change Studies. Once again, I thank the reviewers for their recommendations and direction. My office will continue to work with the Department to ensure that the curriculum meets the needs of students and that the program is appropriately resourced.

Sincerely,

Katherine R. Larson

Professor Katherine R. Larson
Acting Vice-Principal Academic & Dean

Vice-Provost, Academic Programs' Response (May 1, 2025)

UNIVERSITY OF TORONTO

OFFICE OF THE VICE-PROVOST,
ACADEMIC PROGRAMS

May 1, 2025

Professor Katherine R. Larson
Acting Vice-Principal, Academic and Dean
University of Toronto Scarborough

Re: Review Report, Proposed Major in Climate Change Studies

Dear Acting Dean Larson,

I am pleased to receive the external review report for the proposed Major in Climate Change Studies. Your administrative response to the report nicely summarizes the report and addresses the specific recommendations and suggestions made by the reviewers, which fall into four broad areas: program objectives and assessment of teaching and learning; program requirements; faculty, staff, and lab resources; and cross-departmental coordination and student wayfinding.

Program Objectives and Assessment of Teaching and Learning

The reviewers expressed some concern regarding the measurability of the program objectives and program learning outcomes, as they are written. They recommended clarifying how the program learning outcomes will be assessed, and the process by which the supervisors of experiential learning opportunities provide feedback to faculty on student performance. In your response, you note that Section 3 of the proposal has been revised to a include an explanatory sentence indicating that, as is the norm at the University, the program objectives are structured as clear and concise statements that describe the broad goals of the program. You state that a second sentence has been added to Section 3, directing readers to Sections 7.2 and 8 of the proposal where the proposal lays out the program learning outcomes and discusses that student achievement of the learning outcomes will be assessed and monitored through the routine review of graduation rates, attrition numbers, course evaluations, and the cyclical review process. Regarding the process by which supervisors of experiential opportunities provide feedback to faculty, you note that course instructors will meet regularly with these supervisors to discuss students' performance and engagement, and faculty will meet annually to discuss and assess the program. You also note your intention to encourage the Department Chair to engage in regular dialogue with the

Associate Dean Experiential Learning and Global Learning, the UTSC campus Experiential Learning Steering Committee, and the staff support team for experiential learning at UTSC (TeamX) to explore and refine strategies.

Program Requirements

The reviewers recommended that courses focused on methods/social science research and climate change policy development, interpretation, and evaluation be included as requirements in the program. In your response, you highlight that the core capstone course, EESD17Y3/ESTD17Y3, requires students to undertake research work through which they will gain proficiency in methods and social science research. Moreover, the program is designed to integrate research skills with a range of possible career pathways. Regarding climate change policy development content, you have highlighted that core and elective courses, such as ESTB04H3 (Addressing the Climate Crisis), ESTC36H3 (Knowledge, Ethics, and Environmental Decision-Making), ESTC37H3 (Energy and Sustainability), and ESTD20H3 (Integrated Natural Resource and Climate Change Governance), will introduce and develop students' skills in critical policy evaluation and analysis. As a final note, you indicate that your office will continue to support the Department in exploring the development of future courses related to climate policy.

Faculty, Staff, and Lab Resources

Although the report is clear that faculty resources to support the program are appropriate, the reviewers suggested that potentially hiring additional faculty through a Canada Research Chair (CRC) will be beneficial for growing and sustaining the program. However, the reviewers evinced some concern regarding administrative and technical staff support for the program, noting that existing support staff are already at capacity. Their recommendation is that staff support for the new program should be prioritized. In your response, you agree with the reviewers regarding additional faculty hiring through avenues such as CRC and note that the CERC NEST (Network for Equity in Sustainability Transitions) hiring initiative holds potential for the Major in Climate Change Studies. In terms of staff resources to support the program, you note that the Department has been experiencing temporary staff workload issues that will be resolved through hiring backfill positions, the return of staff who have been on leave, and the updating of the job description for the Department's Manager, Academic Program Administration. With these imminent changes, students will be able to receive program-specific academic advising through the Department, which will supplement the holistic academic advising provided through the campus's Academic Advising & Career Centre.

Cross-departmental Coordination and Student Wayfinding

The reviewers recommended establishing a coordinating/advisory committee that meets annually or once per semester to support interdisciplinary collaboration and identify opportunities for student enrichment. They also recommended better marketing the differences between the environmental and climate change studies majors. In your response, you say your office will work the Department to launch an advisory committee aimed at facilitating discussions and consultations on interdisciplinary curriculum matters with the goal of enhancing the student experience. You also highlight that such conversations have already begun with additional Humanities and Social Sciences units at UTSC. With regard to better marketing the differences between environmental programs at UTSC, you say in your response that you will encourage the Department to reach out to the campus Marketing and Communications team to explore strategies for promoting the various programs, and your office will work with the Academic Advising & Career Centre to prioritize this differentiation as part of student outreach and advising.

Finally, your response letter notes that there have been a few modest revisions to the new program proposal that do not relate to the recommendations and concerns raised by the reviewers. These include the removal of an elective course from the program because it is not offered on a frequent enough cycle to support the completion of the program; these changes apply to Sections 6, 7.2, Appendix A, and Appendix E of the proposal. Second, Section 7.1 has been updated to clarify that unlimited programs can be selected at any time on ACORN (and do not require students to have completed their first 4.0 credits). Lastly, Section 9 has been updated to include supplementary consultation with the Office of the Registrar at UTSC, and a commitment to continue working with cognate units offering electives to monitor course availability.

Sincerely,

Nicholas Rule
Vice-Provost, Academic Programs

cc:
Rhonda Martin, Executive Assistant to the Vice-Principal, Academic and Dean, University of Toronto Scarborough

Suzanne Sicchia, Associate Dean Undergraduate Programs & Curriculum, University of Toronto Scarborough
Kevin Mak, Academic Programs Officer, University of Toronto Scarborough
Lachmi Singh, Director, Academic Programs, Planning & Quality Assurance, Office of the Vice-Provost, Academic Programs
Jennifer Francisco, Academic Change Specialist, Office of the Vice-Provost, Academic Programs
Annette Knott, Academic Change Specialist, Office of the Vice-Provost, Academic Programs

New Undergraduate Program Proposal

University of Toronto
New Undergraduate and Graduate Program Proposal

Framework for UTQAP New Programs

UTQAP processes support a structured approach for creating, reflecting on, assessing, and developing plans to change and improve academic programs and units in the context of institutional and divisional commitments and priorities.

The University of Toronto (U of T), in its Statement of Institutional Purpose (1992), articulates its mission as a commitment "to being an internationally significant research university, with undergraduate, graduate, and professional programs of excellent quality." Thus “quality assurance through assessment of new program proposals and review of academic programs and units in which they reside is a priority for the University…:

> The quality of the scholarship of the faculty, and the degree to which that scholarship is brought to bear in teaching are the foundations of academic excellence. More generally, all of the factors that contribute to collegial and scholarly life — academic and administrative complement, research and scholarly activity, infrastructure, governance, etc. — bear on the quality of academic programs and the broad educational experience of students. (Policy for Approval and Review of Academic Programs and Units (2010))

The University’s approach to quality assurance is built on two primary indicators of academic excellence: the quality of the scholarship and research of faculty; and the success with which that scholarship and research is brought to bear on the achievement of Degree Level Expectations.

These indicators are assessed by determining how our scholarship, research and programs compare to those of our international peer institutions and how well our programs meet their Degree Level Expectations.

The University of Toronto embraces academic change as a critical part of maintaining and enhancing programs of outstanding quality through a process of continuous improvement. Proposals for graduate programs are vehicles of academic change.

New Graduate Programs

The New Program Approval Protocol sets out the steps to be taken at the University to assemble and provide the information required in support of the development, approval, implementation, and monitoring of new programs. The Protocol is designed to ensure the following:

Programs are aligned with the objectives of the academic division and of the University, as specified within the Statement of Institutional Purpose and within current priority statements and academic plans, and thereby advance the mission of the University and the academic division.

The educational experiences offered to students are engaging and rigorous, and that the approved programs through which those experiences are provided are routinely monitored and, if necessary, revised, consistent with Quality Assurance Framework (QAF)[1] objectives

The procedures followed for the assessment of proposed new academic degree programs are in accordance with the University's Policy for Approval and Review of Academic Programs and Units and the QAF.

The New Program Approval Protocol applies to new undergraduate or graduate degrees, undergraduate specialists and majors within approved degrees, and to graduate degree programs, offered in full or in part by the University of Toronto or by the University of Toronto jointly or conjointly with institutions federated or affiliated with the University. New for-credit graduate diplomas and new standalone degree programs arising from a long-standing field in a master's or doctoral program go through the Expedited Approval Protocol (see UTQAP section 2.8). All proposed new programs except graduate diplomas are subject to external appraisal.

[1] The Quality Assurance Framework (QAF) outlines quality assurance processes for Ontario universities. Each institution has developed its own Institutional Quality Assurance Process based on the QAF. The University of Toronto Quality Assurance Process aligns with the QAF.

This template aligns with UTQAP requirements and will help to ensure that all evaluation criteria established by the Quality Council are addressed in bringing forward a proposal. Divisions may have additional requirements that should be integrated into the proposal.

Full name of proposed program: (i.e., Specialist in Historical Studies; Master of Arts in History)	Major in Climate Change Studies
Degree name and short form: i.e., Honours Bachelor of Science, HBA; Master of Arts, MA;	Honours Bachelor of Arts (HBA)
Program name: i.e., History; Sustainability Management	Climate Change Studies
Professional program: yes or no	No
Unit (if applicable) offering the program: i.e., site of academic authority. Where a program is housed elsewhere (in physical terms), this should also be indicated. For graduate, if a new graduate unit is contemplated, please indicate here.	Department of Physical and Environmental Sciences
Faculty/division:	University of Toronto Scarborough
Dean's Office contact:	Suzanne Sicchia, Associate Dean, Undergraduate Programs and Curriculum (adundergraduate.utsc@utoronto.ca) Kevin Mak, Academic Programs Officer (kevin.mak@utoronto.ca)
Proponents:	George Arhonditsis, Chair, Department of Physical and Environmental Sciences (dpeschair.utsc@utoronto.ca) Laura Tozer, Assistant Professor, Department of Physical and Environmental Sciences (laura.tozer@utoronto.ca)

Version date (please change as you edit this proposal):	April 28, 2025

Development & Approval Steps	**Date (e.g., of external appraisal site visit, final sign off, governance meeting, quality council submission, ministry submission)**
New Program Consultation Meeting	May 11, 2023
Consultation Proponents/Dean's Office/Provost's Office	
Provost's Advisory Group	December 18, 2024
External Appraisal	March 24-25, 2025
Decanal signoff *In signing off I confirm that I have ensured appropriate:* ✓ compliance with the evaluation criteria listed in UTQAP section 2.3 ✓ consultation with the Office of the Vice-Provost, Academic Programs early in the process of proposal development ✓ Consultation with faculty and students, other University divisions and external institutions	Karin Ruhlandt, Dean, University of Toronto Scarborough March 3, 2025
Provostial signoff *In signing off I confirm that the new program proposal:* ✓ Is complete ✓ Includes information on all the evaluation criteria listed in UTQAP section 2.3	Nicholas Rule, Vice-Provost, Academic Programs January 28, 2025
Unit-level approval (if required)	September 2024
Faculty/divisional governance – UTSC AAC	May 7, 2025
Submission to Provost's Office	
AP&P	May 13, 2025
Academic Board	N/A
Executive Committee of Governing Council	N/A
The program may begin advertising as long as any material includes the clear statement that, "No offer of admissions will be made to the program pending final approval by the Quality Council and the Ministry of Colleges and Universities (where the latter is required)."	
Submitted to Ontario Quality Council	May 30, 2025 for June 2025 meetings
Submitted to the Ministry (in case of new graduate degrees and programs, new diplomas)	N/A

New Program Proposal

Major in Climate Change Studies
Department of Physical and Environmental Sciences
University of Toronto Scarborough

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1 Executive Summary

Please provide a brief overview of the proposed program summarizing the key points from each section of the proposal.

The Department of Physical and Environmental Sciences (DPES) at the University of Toronto Scarborough (UTSC) is proposing a new undergraduate Major program in Climate Change Studies. The proposed Major is a social science-focused program that will lead to the Honours Bachelor of Arts (HBA) degree.

Climate change is a profound challenge for society. This Major in Climate Change Studies prepares students to understand and address the social, economic, political, and ecological aspects of climate change by providing them with a strong foundation in the human dimensions of climate change (e.g., policy responses, social justice concerns, and cultural change), as well as an introduction to the physical science basis of climate change (e.g., global ecological and geophysical systems).

Students complete courses in interdisciplinary environmental studies and environmental sciences, as well as related courses in politics and other social sciences. Through the selection of elective courses, students will have the opportunity to focus on aspects of the climate change challenge in accordance with their interests and career goals, including scientific, political, social and cultural aspects (e.g., politics, Indigenous studies, policy, law, development studies etc.), and/or physical science aspects of climate change (e.g., climatology, climate change impact assessment etc.). Designed to be open to UTSC students across a wide range of disciplines, the proposed Major includes comprehensive theory-based courses, training in research methods, and opportunities for experiential learning. Interdisciplinary training grounded in the environmental studies discipline at UTSC will educate well-rounded students and prepare them for graduate school and a range of climate change related careers in government, civil society, and the private sector.

This program is timely and offers key distinctive elements. It is crucial that universities prepare students for a future in a climate-changed world. Climate change is here and disproportionately harms marginalized communities. Other climate change programs offered in Ontario are focused on natural sciences. This program, however, focuses on the human dimensions of

climate change, but integrates interdisciplinary approaches. Since climate change has social, economic, ecological, and political components, a foundation of knowledge across these dimensions is required. In addition to the interdisciplinary orientation, this program is also distinct in the creation of opportunities for students to build literacy in climate change without requiring a physical science background.

The academic design of the program draws upon the expertise of the Department of Physical and Environmental Sciences' environmental studies faculty in the fields of transdisciplinary climate adaptation and mitigation research, community-based research, and environmental decision analysis. There are nine DPES faculty members that will support the proposed Major with a balanced mix of teaching/tenure-stream and pre/post-tenure faculty. These faculty include three core members from the Environmental Studies discipline group: two in the tenure stream (Klenk and Tozer) and one in the teaching stream (MacLellan).

Consultation to develop this program took place between 2020-2024. The proponents consulted with UTSC departments including the Department of Physical and Environmental Sciences, the Departments of Political Science and Human Geography, and all UTSC departments with elective courses included in the program. Other campus departments with similar programs were also consulted, including the School of the Environment in the Faculty of Arts & Science and the University of Toronto Mississauga (UTM) Geography, Geomatics and Environment department. The Dean's Offices from the Faculty of Arts & Science, the University of Toronto Mississauga, the John H. Daniels Faculty of Architecture, Landscape and Design, and the Faculty of Applied Science and Engineering were also consulted. Students at UTSC in environmental studies programs were consulted. On the UTSC campus, consultations were also conducted with the Campus Curriculum Committee, the Office of the Dean, the Centre for Teaching and Learning, the Department of Community Partnerships and Engagement, and the Integrated Experience Learning team. The Office of the Vice-Provost, Academic Programs also provided feedback.

2 Effective Date and Date of First Review

Anticipated date students will start the program: September 1, 2025

First date degree program will undergo a UTQAP review and with which unit[2]:
The proposed Major will be reviewed with programs housed in the Department of Physical and Environmental Sciences. A UTQAP review and site visit of the Department and its programs took place in March 2024; the proposed program would therefore be reviewed at the next scheduled review of the unit and its programs, which is planned to take place no later than the 2031-32 academic year.

3 Academic Rationale and Program Objectives

Please state the program objectives and degree nomenclature and then go on to describe the academic rationale for the new program. Consider the new offering relative to the criteria listed in a) – e) below.

a) the program's objectives.
b) Appropriateness of degree or diploma nomenclature given the program's objectives
c) Consistency of the program's objectives with the institution's mission and U of T's/the division's/unit's academic plans, priorities and commitments, including consistency with any implementation plans developed following a previous review.
d) Evidence that the following have been substantially considered in the context of developing the changes to the program and its associated resources:
    1. Universal design principles and/or the potential need to provide mental or physical disability-related accommodations, reflecting the University's *Statement of Commitment Regarding Persons with Disabilities*
    2. Support for student well-being and sense of community in the learning and teaching environment, reflecting the work of the Expert Panel on Undergraduate Student Educational Experience and the commitment to establishing a Culture of Caring and Excellence as recommended by the Presidential and Provostial Task Force on Student Mental Health
    3. Opportunities for removing barriers to access and increasing retention rates for Indigenous students; for integrating Indigenous content into the curriculum in consultation with Indigenous curriculum developers; and for addressing any

[2] Programs that are inter- and multidisciplinary must identify a permanent lead administrative division and identify a commissioning officer for future cyclical program reviews.

discipline-specific calls to action, reflecting the commitments made in *Answering the Call: Wecheehetowin: Final Report of the Steering Committee for the University of Toronto Response to the Truth and Reconciliation Commission of Canada*

4. Opportunities for removing barriers to access and increasing retention rates for Black students; for promoting intersectional Black flourishing, fostering inclusive excellence and enabling mutuality in teaching and learning, reflecting the commitments made in the *Scarborough Charter* and consistent with the recommendations of the *Anti-Black Racism Task Force Final Report*
5. Opportunities for fostering an equitable, diverse, and inclusive teaching and learning environment, reflecting the values articulated in existing institutional documents such as the *Statement on Equity, Diversity, and Excellence*, the *Antisemitism Working Group Final Report*, the aforementioned reports, and future institutional reports related to equity, diversity and inclusion.

e) Unique curriculum or program innovations, creative components, significant high impact practices, where appropriate

Program Objectives

The program objectives, which describe the broad goals of the program, are:

- To prepare students to understand and address the social, economic, political, and ecological aspects of the climate crisis.
- To provide students with a strong foundation in the human dimensions of climate change (e.g., policy responses, social justice concerns, and cultural change).
- To introduce students to the physical science basis of climate change (e.g., global ecological systems and the science of climate change).
- To establish a foundation of knowledge in environmental studies and interdisciplinary approaches to climate change that supports the development of expertise in: linking science and policy; techniques for decision-making in contentious contexts; academic and applied research skills; formulating climate change mitigation and adaptation policy; and working with transdisciplinary groups to apply learning in practice.

Program learning outcomes and assessments are discussed in sections 7 and 8 of the proposal.

Appropriateness of Name and Nomenclature

The name of the program (Climate Change Studies) and nomenclature (a Major that leads to an Honours Bachelor of Arts) are appropriate because the proposed Major is a social science-focused undergraduate program. Climate Change *Studies* (as opposed to climate change science) emphasizes the program's focus on the human dimensions of the climate crisis, which is a distinctive feature of this program in a field where most climate programs are focused on physical science. An Honours Bachelor of Arts is appropriate since the program is designed to provide an introductory, interdisciplinary foundation of knowledge built around a core environmental studies education, which is fundamentally a social science discipline.

A Major program (as opposed to a Specialist program) is appropriate because the proposed Major is designed to have wide compatibility with other programs and applicability to students across UTSC. Its key objectives are to offer opportunities to gain scientific literacy about climate change and to spur deep engagement with the human dimensions of climate change. These are the key objectives because students are often directed down separate physical science or social science paths in other programs, but it is important given the inherent interdisciplinarity of the topic of climate change that students gain expertise in both areas. In addition, the basics of the science of climate change are often integrated into physical science programs with pre-requisites that are unlikely to be held by many social science or humanities students. The name and nomenclature of this program are appropriate because they position this program to fill this pedagogical gap.

Academic Rationale

Why the Program is Being Proposed Now

From wildfires in BC and Alberta (2023 and 2024), to flooding in Nova Scotia (2023), to unprecedented fires in Australia (BBC, 2020) to flooding in West and Central Africa (Guardian, 2020) to the impacts of hurricane Fiona in Newfoundland (2022), to ecosystem degradation (IPBES, 2019) to extreme temperatures (Thompson, 2020), climate change is here and disproportionately harms marginalized communities. Climate change is exacerbating existing societal vulnerabilities and is having deep impacts across ecological and social systems. Greenhouse gas emissions continue to rise, and researchers have calculated that global greenhouse gas emissions need to reduce rapidly in the next ten years, reaching net zero by

mid-century, in order to have a chance of avoiding dangerous climate change (Rogelj et al., 2018). Low carbon transitions and adapted systems are emerging, but too slowly. The urgency of the climate crisis has been recognized across society by municipalities declaring climate emergencies, nations signing the UN Paris Climate Agreement, and young people of the Fridays for Future movement advocating for ambitious climate action. Universities must begin preparing students for a future in a climate-changed world.

Relationship to Evolving Discipline

Cutting-edge work in environmental education emphasizes that climate change has social, economic, ecological, and political components and that successfully responding to the challenge requires a foundation of knowledge across these dimensions. The discipline of environmental studies is the study of many different environmental problems and the knowledge and tools needed to solve them. Climate change studies can be pictured as sitting within this discipline. Climate change studies is inherently interdisciplinary given the ways that it cuts across our society and it requires skills in systems thinking to understand and resolve complex problems. While climate *science* is included in existing programs in environmental sciences offered at UTSC, the campus lacks specialized programs emphasizing the crucial social, political and cultural facets that help us understand the drivers of climate change and how to address them.

The DPES and UTSC are home to extensive leading-edge climate change research that spans across disciplines, and can harness this expertise to lead Canada in climate change undergraduate education. The proposed Major will leverage DPES's expertise in environmental studies, particularly in climate change adaptation and sustainable energy, and in environmental science sub-disciplines such as climate science and impact assessment. It emphasizes the human dimensions of climate change, and will educate students in the cultural, economic and political drivers of the crisis, as well as potential mitigation and adaptation measures. The program integrates environmental studies courses from across a wide array of disciplines to teach systems thinking and problem-solving skills to enable a generation of UTSC students to tackle the 'wicked problem' of climate change. Climate change education also requires a strong foundation in physical science. With a focus on training for scientific literacy, the proposed Major provides an accessible entry point into understanding the earth's climate system and human-driven climate change, while allowing students the option to pursue scientific training adequate to subsequently pursue graduate studies, including in the Master of Environmental Science (field in Climate Change Impacts and Adaptation) offered by the Graduate Department of Physical and Environmental Sciences.

In addition, concerns continue to grow about the ways in which marginalized groups are disproportionately harmed by adverse climate impacts. Equity concerns are also raised about ensuring that actions to reduce greenhouse gas emissions fairly benefit marginalized communities. With a focus on the human dimensions of the climate crisis, this major includes extensive opportunities to learn about equity and justice.

Relationship to Existing Programs and Distinctiveness

Given its scope, the climate crisis must be addressed across all sectors of society. As such, the proposed Major is designed to be compatible with a diverse range of Majors and Minors across UTSC, including, for example, the Major or Minor program in Political Science, the Major program in Physical and Human Geography, the Major program in Socio-Cultural Anthropology or the Minor program in Anthropology, the Major or Minor program in Sociology, as well as programs in the Biological Sciences, City Studies, Chemistry, Health Studies (both HBA and HBSc), Psychology, Arts, Media and Culture, International Development Studies and more. Graduates of this program, whether they are journalists, engineers, entrepreneurs, management consultants, scientists, artists, or government employees will have the literacy that they will need in the human and scientific dimensions of climate change to be able to help find solutions to the most profound problem facing the planet.

The proposed Major will complement existing programs in Environmental Science, offered by the DPES, including:

- Specialist/Specialist (Co-operative) programs in Global Environmental Change (formerly Environmental Biology)
- Specialist/Specialist (Co-operative) programs in Environmental Geoscience
- Major/Major (Co-operative) programs in Environmental Science
- Minor program in Environmental Science (Science)
- Minor program in Natural Sciences and Environmental Management (Science)

All of these offerings are science-focused, with the Major and Specialist programs leading to the Honours Bachelor of Science (HBSc) degree. Their overarching focus is to consider human activity as a major cause of a wide range of environmental changes (not just climate change), and they are oriented around the idea that recent environmental degradation such as surface and subsurface water pollution, air and soil pollution, climate change, depletion of resources, extinction of species and problems of waste disposal are all due to a limited understanding of

environmental systems and processes. The programs in Environmental Science provide education and training that produces highly qualified scientists, with exceptional backgrounds in the theory and applications of environmental science, who are able to provide interdisciplinary solutions to contemporary environmental challenges. All Environmental Science Specialist programs and the Major Program in Environmental Science have earned official accreditation from Environmental Careers Organization (ECO) Canada and the Canadian Environmental Accreditation Commission (CEAC).

The Major in Climate Change Studies will complement these existing programs, which focus on fundamental environmental processes, by instead preparing students to understand and address the social, economic, and political aspects of the climate crisis. While programs like the Specialist in Global Environmental Change develop students' expertise in the Earth's biotic and abiotic patterns and processes (including those within the world's atmosphere, biosphere, cryosphere, hydrosphere, and lithosphere) and the ways these patterns are changing, the Major in Climate Change Studies instead mainly develops expertise in the social sciences by providing students with a strong foundation in the human dimensions of climate change (e.g., policy responses, social justice concerns, and cultural change). Through the proposed program, students also build introductory *literacy* in climate change science without requiring the physical science background necessary for these HBSc programs.

DPES also offers a Major program in Environmental Studies, leading to the Honours Bachelor of Arts (HBA) degree. This program gives students an opportunity to develop an understanding of environmental issues from the perspectives of the physical, life and social sciences. It is designed as a contemporary rendering of the study of environmental problems and the knowledge/tools needed to solve them. One of its key features is the classification of the courses offered into two groups: Foundation & Skills and Capstone & Applications. The former group builds a foundation of socioeconomics and environmental science, while the latter group integrates insights from different disciplines and nurtures an interdisciplinary way of thinking. These courses also include many opportunities for experiential learning through problem-solving case studies, team-based projects and individual research. Special emphasis is placed on the capacity of the program to successfully build the requisite interdisciplinary, problem-solving skill sets needed when tackling environmental management issues. The program effectively balances the need for a strong foundation in basic principles characterizing a typical program in Environmental Studies and the importance of building bridges among the various disciplines involved. This program has recently received accreditation by ECO Canada. The Major in Environmental Studies covers all environmental challenges, not just climate change. While the Major in Environmental Studies and the Major in Climate Change Studies both require

fundamental interdisciplinary thinking and skills courses, the proposed program in Climate Change Studies is distinct since it requires more specialized expertise development specifically related to climate change through core courses and dedicated elective lists that are different from those in the Major in Environmental Studies. A side-by-side comparison of the Major in Environmental Studies and the proposed Major in Climate Change Studies is provided in Appendix E, below.

Other climate change-specific programs offered in Ontario are focused on natural sciences. The proposed program, however, focuses on the human dimensions of climate change, but integrates interdisciplinary approaches. The latest approaches in environmental pedagogy emphasize that climate change has social, economic, ecological, and political components and that a foundation of knowledge across these dimensions is required. This program is distinct in the creation of opportunities for students to build literacy in climate change science without requiring a physical science background. The core of the program emphasizes training in environmental studies and the development of expertise in linking science and policy, techniques for decision-making in contentious contexts, academic and applied research skills, formulating climate change mitigation and adaptation policy, and working with interdisciplinary groups to apply learning in practice.

Fit with Institutional Plans and Priorities

The proposed program's objectives are consistent with U of T, UTSC, and DPES's academic plans, priorities, and commitments. The Major will support the priorities of the UTSC Strategic Plan - *Inspiring Inclusive Excellence*. For example, the program objectives contribute to achieving the initiative (1.2.I): "Develop new programs and review existing programs/curricula with consideration for their responsiveness to development in recent fields; transformations in society more broadly, and the realization of learning outcomes that give our graduates the competencies needed to be successful in their careers and to adapt to a dynamic world." This program focuses on the transformations needed in society to address climate change and is oriented to achieve learning outcomes that give graduating students competency to develop careers consistent with a climate-changed world. The program also contributes to strategic direction 4.2 in the UTSC Strategic Plan: "Continue to expand local, national, and international collaborations with partners across various sectors that help to integrate real-life experiences into the curriculum, create opportunities for co-learning, and facilitate co-creation of knowledge." Consistent with their research activities, the proposed major will offer opportunities for experiential learning projects that build upon the relationships that DPES's Environmental Studies faculty hold with external partners as part of their research and

applications work (see Section 7: Rationale for Program as Designed for additional details about experiential learning).

The proposed program also supports the University of Toronto's *Statement of Institutional Purpose*. For example, it contributes to achieving the University's Mission: "The University of Toronto is committed to being an internationally significant research university, with undergraduate, graduate and professional programs of excellent quality" and its commitment to undergraduate education: "The University is committed to...Providing for breadth and depth in all undergraduate programs." This program is designed to offer top-tier undergraduate education and to fill a gap in current undergraduate program offerings by offering interdisciplinary education focused on the human dimensions of the climate crisis. It is also designed to be combined easily with other majors, which is aligned with the aim of providing breadth in undergraduate programs.

The proposed program builds on DPES's expertise in leading-edge climate change research and teaching that spans across disciplines. It meets DPES's academic plans to expand the academic programs within the Environmental Studies discipline in response to high student demand. The recent review undertaken by the department reconfirmed DPES's commitment to interdisciplinary approaches to physical and environmental sciences, consistent with the design of this program. This program meets the department's aim to increase educational opportunities related to climate change.

Equity, Universal Design Principles, and Health

The proposed program is designed to build students' capacities to engage in equity-based, anti-racist, and anti-colonial work as called for in numerous institutional reports, such as the UTSC Campus Curriculum Review and the U of T Statement on Equity, Diversity, and Excellence. A key objective of the program is to provide students with a strong foundation in the human dimensions of climate change (e.g., policy responses, social justice concerns, and cultural change), including understanding of climate justice as well as engagement with both the disproportionate harms experienced by marginalized communities as well as the climate action leadership from frontline communities. For example, core courses such as ESTB04H3 Addressing the Climate Crisis and ESTC37H3 Energy and Sustainability include a core focus on justice. In addition, elective courses also incorporate Indigenous approaches, such as ESTB02H3/ GGRB18H3 Whose Land? Indigenous-Canada-Land Relations and ESTB03H3/ VPHB69H3 Back to the Land: Restoring Embodied and Affective Ways of Knowing.

The proposed major program will reflect universal design principles both through an ability to ensure that there are no barriers for students of varied needs in courses and learning activities, and through the ability within environmental studies to have a variety of experiential learning approaches, which can help in accommodating a range of learning styles and needs. Moreover, the assessment of learning in required and elective courses is specifically designed to ensure student well-being and resiliency in the learning and teaching environment. An impressive range of evaluation techniques are used by the course instructors that include, but are not limited to, participation in classroom discussions, written and oral assignments, or knowledge synthesis reports, and, if appropriate, the submission of reflexive learning journals. In these papers, reports, and presentations, students are expected to exhibit depth, breadth, and application of knowledge of applied environmental issues, critical thinking skills, and oral and written communication skills appropriate to the undergraduate level. In addition, classical "midterm" and "final" exams are used, but these are commonly take-home exercises that require the synthesis of information. One faculty member also conducts one-on-one meetings to mentor and assess student engagement and quality of work in capstone projects.

UTSC offers a suite of student services that are well-connected to the DPES. This includes, for example, both AccessAbility Services and Health and Wellness Services. AccessAbility Services provides a space for students to access disability consultants and to arrive at accommodations that maintain the learning and training breadth and depth that is expected of students in a particular program. Health and Wellness Services provide mental and physical health services to students. The DPES is fully aware of the struggle that many students face with mental health. For two years now, the department has worked with Health and Wellness to have a mental health counsellor embedded within the unit on a part-time basis. This has proven to be a valuable resource for existing programs, and there is enough flexibility to additionally accommodate this program. As well, staff and faculty are trained, through programs offered by the University, to recognize mental health distress and know how to get help for students in need.

4 Need and Demand

a) Provide a brief description of the need and demand for the proposed program, including information on student demand and internal cognate and external comparator

programs. Please fill out and refer to the table in Appendix D listing the comparator programs.

Societal Need

Climate change is a key trend shaping employment demand and supply over the coming decade and some of the greatest labour needs will be found in the sub-sectors of sustainability, natural resource management, and energy according to a labour market report published by ECO Canada (the leading environmental professional organization in Canada) (ECO Canada 2021). From an employment perspective, the ability to integrate across multiple disciplines and work across sectors will be particularly important (ECO Canada 2021). Graduates from the proposed Major will be well placed to take advantage of a range of job opportunities across sectors, with anticipated growth areas ranging from professional and technical services to public administration to management to educational services to utilities to arts, entertainment and recreation (ECO Canada 2021). The transition to a green economy cannot take place without people with relevant skills and, since climate change affects everything, there is a need for climate related expertise across sectors. The growth in demand has already started; a LinkedIn analysis found that job listings related to climate change have increased 8% annually for the past 5 years (LinkedIn 2022). The International Labour Office predicts that opportunities in clean energy, environmental science, policy making, and planning will create up to 24 million jobs over the next 10 years (ILO 2018). Graduates of this program will be particularly well suited to develop careers as climate policy analysts, renewable energy specialists, sustainability consultants, planners, climate change and decarbonization managers, renewable energy project developers, solar logistics managers, climate change adaptation and resiliency leads, environmental, social and governance (ESG) managers, climate change education and communication specialists etc.

Student Demand

There is strong demand for interdisciplinary environmental studies education, as evidenced by steady increases in enrolment in the existing Major in Environmental Studies. Since its introduction in 2012-13, it has grown from 14 students in 2013 to over 250 students in 2022. ESTB01H3 students were surveyed in Fall 2022 and 69% indicated definitely or probably yes when asked; “Given the opportunity, would you consider the Climate Change Studies Major instead of or in addition to your current program of study.”

Students will be able to combine the proposed Major with a wide range of Major and Minor programs at UTSC. This will allow students to shape their career pathways or future studies depending on their combinations of programs.

For example:

- Combining the proposed Major with the Major in Political Science will allow students to pursue a career as a policy analyst with government designing and implementing climate change programs.
- Combining the proposed Major with the Major in Psychology will allow students to pursue a career influencing pro-environmental decision-making and behaviour.
- Combining the proposed Major with the Major in Environmental Science will allow students to pursue a science-policy interface career focused on mobilizing findings on the impacts of climate change to guide policy responses.
- Combining the proposed Major with the Major in Media and Communication Studies (formerly Media, Journalism, and Digital Cultures) will allow students to pursue a career in reporting on a multi-faceted global crisis.

These are just a few examples, since climate change overlaps with a wide range of disciplines and the proposed Major allows for customization so that students can find synergies with a number of arts or science programs. Climate Change Studies is a good partner with other programs because the urgency of the crisis has meant that professionals in a wide range of fields now find it essential to their work.

Distinctiveness from Other Programs

Programs in DPES at UTSC

The proposed Major in Climate Change Studies is distinguished from programs in Environmental Science and Environmental Studies at UTSC because it will focus on the human dimensions of climate change while integrating interdisciplinary approaches, and rather than emphasizing the natural sciences, it provides opportunities to build climate science literacy without requiring a physical science background. It emphasizes specialized expertise in climate change through unique core courses in environmental social sciences and electives. Students gain training in environmental studies, science-policy integration, decision-making in contentious contexts, climate mitigation and adaptation policy, academic and applied research, and interdisciplinary collaboration, reflecting the latest environmental pedagogy approaches.

The DPES offers Specialist/Specialist Co-op programs in Global Environmental Change that emphasize environmental science courses and cover a wide range of environmental change processes. In contrast, the proposed Major is grounded in environmental studies to provide comprehensive training in the human dimensions of climate change and scientific literacy on the physical science basis of climate change. The DPES also offers a Major in Environmental Studies, and there is some overlap in the program requirements with the proposed Major to take advantage of the interdisciplinary environmental studies expertise in the department. These overlaps are sufficient to preclude students from combining the proposed Major with the Major in Environmental Studies. The Major in Climate Change Studies is distinct since it requires more specialized expertise development specifically related to climate change through core courses and dedicated elective lists that are different from those in the Major in Environmental Studies.

Table 1: Distinction of Proposed Program from Select Environmental Programs in DPES

There are several interdisciplinary environmental programs offered in the Department. Since the department has numerous programs, only the programs most similar to the proposed major are included here. For clarity about the distinction of the proposed program, Table 1 offers a breakdown of key similarities and differences across the program structure, key themes, and career trajectories for graduates.

Program/ Offering	Appeals to Students With	Program Structure	Key Themes	Commonalities	Career Trajectories
Environmental Studies Major (Arts)	Any background; Interest in both physical and social science perspectives on the environment, sustainability, environmental problems and their solutions	8.5 credits: Core Courses (2.5 credits), Foundations and Skills (4.0 credits), Capstone and Applications (2.0 credits)	This major gives students an opportunity to develop an understanding of environmental issues from the perspectives of the physical, life and social sciences	Foundational courses in environmental studies are common to this program and the proposed program	Career in public policy, non-profit or private environmental sector

Environmental Science Major (Science)	Background and interest in natural/ physical sciences; Interest in environmental challenges	8.5 credits, 7 EES courses in the first year, 5 EES courses in the second year, 2.0 credits at the C- or D-level in EES in the third and fourth years.	Environmental science with field and laboratory experience	Some of the foundational courses in environmental science focus on climate change and therefore there is a small amount of overlap in terms of themes with the proposed new major.	Careers in consulting, government, non-governmental organizations and research and teaching.
Global Environmental Change Specialist (Science)	Background and interest in natural/ physical sciences; Interest in human-environment interactions	14.5 credits: 4.5 BIO, CHM, and EES courses in first year, 5 credits in CSC, STA, BIO, CHEM, EES in second year, and 5 credits in third and fourth year in BIO and EES.	Earth's biotic and abiotic patterns and processes (including those within the world's atmosphere, biosphere, cryosphere, hydrosphere, and lithosphere) and the ways these patterns are changing	This Specialist is focused on the natural sciences with advanced scientific courses along with applied environmental skills courses. There is some overlap with the physical science electives offered in the proposed major.	Careers in consulting, government, non-governmental organizations and research and teaching.
Proposed Climate Change Studies Major (Arts)	Any background; Interest in human dimensions of climate change; interest in interdisciplinary approaches	8.5 credits: First Year: 1.5 credits in core EST and EES courses and 1.0 credit from interdisciplinary elective list, Second Year: 1 credit core EST	Social, economic, political, and ecological aspects of the climate crisis, with a foundation in the human dimensions of	Foundational courses in environmental studies are common between the major in Environmental Studies and the major in	Career in public policy, non-profit or private environmental sector

		courses and 0.5 credit from interdisciplinary elective list, Third/Fourth Year: 4.5 credits from mainly EST courses, also electives from interdisciplinary list	climate change and introduction to the physical science basis of climate change	Climate Change studies	

Comparator Programs in Other U of T Divisions

In addition to adding an area of distinctiveness in the DPES and at UTSC, the proposed program complements and further enriches U of T's existing research strengths in environmental science. This is an area of clear and growing excellence for the tri-campus context, as evidenced by existing programs and faculty resources; indeed, U of T ranks 21 in the 2024 QS World University Rankings in the area. In the Faculty of Arts & Science, the Department of Earth Sciences offers the Earth and Environmental Systems Major, which is a natural science program that includes global environmental change as one of the main topics. The Faculty of Arts & Science also has the following offerings, which may be viewed as cognate to the proposed Major:

- Environmental Studies Major and Minor
- Environmental Ethics Major and Minor
- Environmental Economics Minor
- Environmental Anthropology Minor
- Environmental Geography Specialist, Major, and Minor

At the University of Toronto Mississauga, one related program offered is the Environmental Management Specialist/Major/Minor, which addresses similar human dimensions of environmental change with a foundation in environmental science.

There are also several certificate and minor offerings at UTSC and across the tri-campus that students may take in conjunction with their Major or Specialist programs. These are small offerings that are mainly of interest to students who wish to combine interests in

environmental studies/science with their deep engagement in other academic areas. The DPES has a Natural Sciences and Environmental Management Minor that focuses on the origin and natural history of the Earth, environmental science, and environmental management, with emphasis on how these branches of study relate to one another. Since 2022-23, the DPES has offered a freestanding Minor in Applied Climatology, which focuses on physical science training. A Certificate in Sustainability is offered by all three University of Toronto campuses, focusing on the sustainable utilization of our natural, social, economic and cultural resources.

U of T also houses a Certificate in Sustainability of the Built Environment in the John H. Daniels Faculty of Architecture, Landscape and Design, and an Environmental Engineering Minor and a Sustainable Energy Minor in the Faculty of Applied Science and Engineering. In the Faculty of Arts & Science, the School of the Environment and the Department of Geography and Planning jointly offer a Minor in Environment and Energy. At the University of Toronto Mississauga, there is also a Sustainability Minor that has some similarities, although with a broader focus, and an Environmental Law and Policy Minor, which is similar since this proposal contains a significant policy and politics focus.

In Ontario and Canada

Trent University offers a BSc in Climate Change Science and Policy through the School of the Environment. The program is described as follows in the Trent course calendar: “The courses and learning outcomes align with the Intergovernmental Panel on Climate Change (IPCC) working groups, namely ‘science,’ ‘impacts,’ and ‘mitigation.’ The ‘science’ of climate change requires an understanding of physics, chemistry, and geography; the ‘impacts’ of climate change require an understanding of ecology, resource management, hydrology, planning, economics, and social justice; and the ‘mitigation’ of climate change requires an understanding of policy, business, finance, law, and energy technologies.” This program is similar to the proposed Major in its interdisciplinary breadth and development of climate change-specific courses such as Climate Data and Analytics and Carbon Accounting and Management. However, this is a BSc program with more requirements in physics, biology, chemistry, and math and less focus on environmental studies, social sciences, and policy and decision-making. Trent University also offers a Specialization in Climate Change Science and Policy that is not as comprehensive as the proposed Major. It requires students to take 8 courses as part of a degree in Geography, Environmental Science/Studies, or Environmental & Resource Science/Studies. At Trent University, specializations allow students to develop areas of focus within their degree majors.

The University of Waterloo offers a BSc in Climate and Environmental Change through the Faculty of Environment in the Department of Geography and Environmental Management. The program focuses on science behind the challenges facing our planet's environment and it combines biology, chemistry, physics, and earth science with human geography. The Department of Geography and Environmental Management also offers a Bachelor of Environmental Studies in Geography and Environmental Management, within which students can choose a specialization in climate and environmental change. Specializations at Waterloo are 4-7 courses allowing students to focus on a specific topic within their major. Unlike the proposed Major, neither program integrates a set of core courses focused on environmental studies theory and skills for policy development and decision making. They are focused on natural sciences.

In addition to a BSc in Environmental Sciences, the University of British Columbia (UBC) has a BA in Environment and Sustainability through the Department of Geography, which is an interdisciplinary program with a focus on justice and issues such as climate change, biodiversity loss, and access to clean water. A Bachelor of Sustainability is also offered through UBC Okanagan, which is an interdisciplinary program with the following areas of concentration: Environmental Analytics, Environmental Conservation and Management, Environmental Humanities or Green Chemistry.

Internationally

Climate change is increasingly being integrated into a wide variety of degree programs around the world. A recent Time magazine article describes this trend, but also explains that "until very recently, if climate appeared at all in humanities, social sciences and the arts, it was as a concentration or postgrad degree" (Nugent, 2021). In Europe, programs in climate change do exist, but they are often natural science-based Master's degrees. Below are a few examples:

- MSc in Climate Change Science and Policy, University of Bristol, UK
- Master of Disaster Risk Management and Climate Change Adaptation, Lund University, Sweden
- MSc in Climate Change, University of East Anglia, UK

Four of the top ranked universities in the environmental science area are Harvard, the Massachusetts Institute of Technology (MIT), Stanford, and the University of California, Berkeley (UC Berkeley). In the undergraduate space, Harvard University offers majors in Environmental Science and Engineering and Environmental Science and Public Policy. Both

programs provide students with a broad education in the sciences and hands-on experience to help them solve environmental problems. The latter program offers an area of concentration in Energy and Environment. These programs differ from the proposed program because they focus on physical sciences and are not specifically focused on climate change but instead focus on environmental science in general.

MIT offers an undergraduate degree in Climate System Science and Engineering (offered for the first time in 2024). This degree program is a collaboration between the Departments of Civil and Environmental Engineering (CEE) and Earth, Atmospheric and Planetary Sciences (EAPS). It has a focus on the physical science basis of climate change, with social science electives. This differs from the proposed program, which focuses on social sciences and the human dimensions rather than the physical/climate science basis.

Stanford University offers several physical science undergraduate degrees through the Doerr School of Sustainability: Civil and Environmental Engineering, Earth and Planetary Science, Energy Science and Engineering, Geophysics, and the Earth Systems Program. These programs differ from the proposed program because they focus on physical sciences and are not specifically focused on climate change but instead focus on physical science or engineering in general.

UC Berkeley offers several undergraduate majors related to sustainability, including Sustainable Environmental Design (SED), Conservation and Resource Studies, Society and Environment, Environmental Economics and Policy, and Environmental Sciences. Society and Environment is an environmental social science major focused on addressing environmental problems, and students can pick from three areas of focus within this major: (1) U.S. Environmental Policy and Management, (2) Global Environmental Politics, or (3) Justice and Sustainability. These programs differ from the proposed program because none of them are specifically focused on climate change. Instead, they focus on multiple environmental challenges.

What these programs tell us is there is an increasing interest in climate change-specific offerings more broadly, as well as undergraduate offerings that focus specifically on the environmental social sciences. The proposed Major in Climate Change Studies is aligned with these cutting-edge offerings by peer institutions.

b) In 500 words or less, discuss the labour market demand for the program, including three occupations that graduates from the proposed program may be employed in, the demonstrated demand for employment the professions and employment prospects.

Highly trained employees in environmental science continue to be in high demand according to Environmental Careers Organization (ECO) of Canada's latest job trends report for 2022 (ECO Canada, 2022). While Canada saw an overall, year-to-year increase of 7% in the number of job ads, the increase in environment-related job ads was considerably greater at 17%. The ECO Canada report (ECO Canada, 2022) links these increases with a continued excellent Canadian job market overall; growth in industries that employ environmental workers, such as manufacturing, professional, scientific and technical services, public administration and construction; and the implementation of climate change plans by all levels of government. Our department has established close collaboration with ECO Canada, which allows our Internship staff to stay informed about environmental trends and negotiate "student level membership" pathways and student access to membership perks and industry mentorship programs. In addition to ECO Canada, DPES Internship staff coordinate with the Ontario Environment Industry Association (ONEIA), Professional Geoscientists of Ontario (PGO), the Mining Industry Human Resources Council (MiHR), BioTalent Canada, Professional Engineers Ontario/local chapters and Mitacs to continue to foster intentional partnerships and student skill-building opportunities. There is a multitude of positions that graduates from the proposed program may be employed in, such as Regional Climate Modellers; Climate Data Analysts; Climate Research Analysts; Nature-based Climate Solutions Associates; Smart Energy Communities Accelerator specialists; Climate Data Analysts; Sustainability specialists; Professional Consultants – Labour Migration and Social Inclusion; and Professional Consultants – Climate Change Response & Sustainability among others.

5 Enrolment

- Please provide details regarding the anticipated in-take by year, reflecting the expected increases to reach steady state. Include approximate domestic/international mix. This table should reflect normal estimated program length. (Please adjust the table as necessary.)

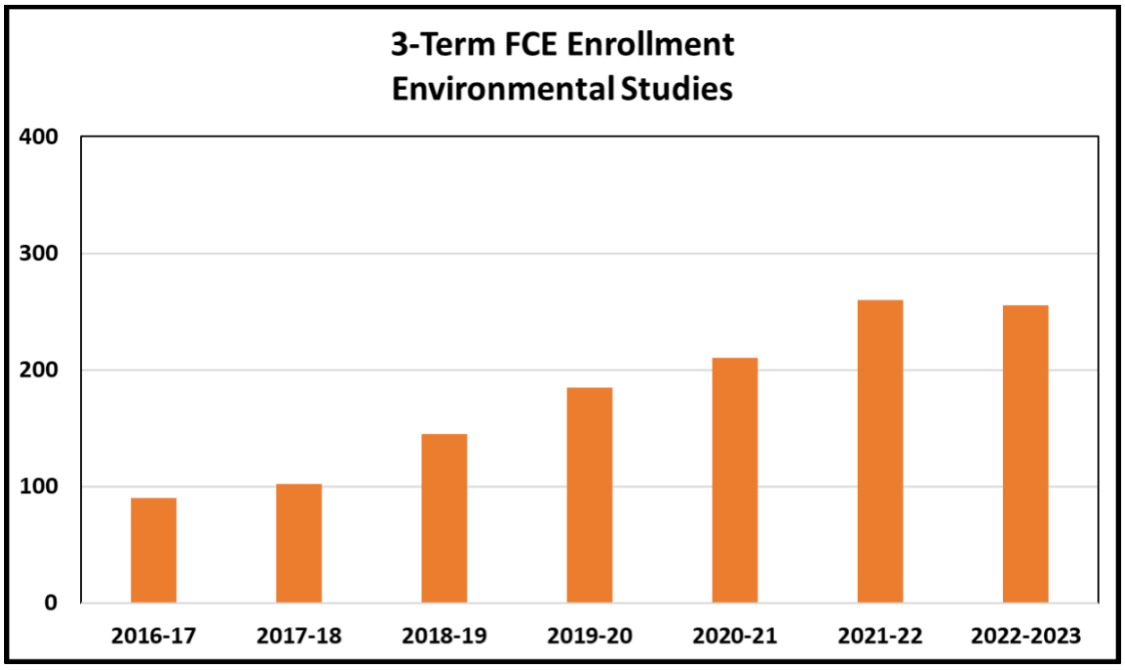
- Please provide an explanation of the numbers shown and their relation to the Faculty/division's enrolment plan. Please be specific where this may differ from approved enrolment plans.

Table 2: Enrolment Projections*

Year of Study	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31*	2031-32
Year 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Year 2	15	35	50	65	65	65	65
Year 3	5	11	30	45	60	60	60
Year 4	0	4	8	25	40	55	55
Total	20	50	88	135	170	180	180

*The program is expected to reach steady state in 2030-31.

We anticipate growth in enrolment in the program over 5 years reaching a steady state of 180 total enrolled students in 2030-31, with 65 *new* enrolments per year by 2030 and a reasonable expectation of student attrition in later years. 70% domestic and 30% international students will be admitted into the program. This projection is based on the rate of growth and steady state experienced for the Environmental Studies Major program.



We anticipate the proposed Major will follow a similar enrolment trajectory to the Major in Environmental Studies. We expect to attract mainly new students not enrolled in Environmental Studies who are attracted by the specific skill development in the climate change sector and recognize opportunities to combine the program with other UTSC programs (e.g. political science, anthropology etc.). With broad appeal to students across UTSC, the proposed Major will allow students to gain unique, timely and complementary training that combines well with a range of other programs. While we do not anticipate impacts on enrolment in the existing Major in Environmental Studies program, we will monitor this after the new program launches to see what students are choosing over time. While there may be some adjustment of enrolments across programs at UTSC, the overall enrolments at UTSC will remain within the allotted corridor.

We anticipate that this level of enrolment can be supported by existing faculty, with key supporting investments in additional capacity through additional TA support and the hiring process for an additional faculty position through CERC Justice NEST is underway (see section 10 Resources for additional details). The predicted enrolment trajectory has been built into enrolment planning in DPES and UTSC.

6 Calendar Copy

Provide a complete Calendar entry for the new program. Include a description of the program (audiences: prospective and current students, staff and employers) that includes the key features of the program:

- Program's purpose (who is it for, what are the outcomes).
- Nature of learning environment (including mode of delivery).
- Approaches to teaching/learning/assessment.
- Basic information (e.g., FCE count, program length, etc.).
- Provide as an appendix:
    - A full list of all courses included in the program including course numbers, titles, and descriptions.
    - Please indicate clearly whether they are new/existing. (Please note that all new courses should be proposed and approved independently in line with established academic change procedures. Where possible, append full course proposals as an appendix.)

Program Description

Climate change is a profound challenge for society. The Major in Climate Change Studies prepares students to understand and address the social, economic, political, and ecological aspects of climate change by providing them with a strong foundation in the human dimensions of climate change (e.g., policy responses, social justice concerns, and cultural change), as well as an introduction to the physical science basis of climate change (e.g., global ecological systems and the science of climate change).

Students complete courses in interdisciplinary environmental studies and environmental sciences, as well as courses in politics and social sciences. Through the selection of elective courses, students will have the opportunity to focus on aspects of the climate change challenge in accordance with their interests and career goals, including scientific, political, social and cultural aspects (e.g., politics, Indigenous studies, policy, law, development studies etc.), and/or physical science aspects of climate change (e.g., climatology, climate change impact assessment etc.). These courses also include many opportunities for experiential learning through problem-solving case studies, team-based projects, and individual research. The Major in Climate Change Studies is an excellent companion to Majors such as Anthropology, Human Geography, Political Science, Public Policy, Sociology, Chemistry, Biochemistry, Environmental Science, Biology, Biodiversity, Ecology and Evolution, Physics and Astrophysics, and Physical Sciences.

Restrictions

The Major in Climate Change Studies cannot be combined with the Major in Environmental Studies.

Program Requirements

Students must complete 8.5 credits as follows:

Foundations (2.5 credits)

EESA01H3 Introduction to Environmental Science
EESA06H3 Introduction to Planet Earth
ESTB01H3 Introduction to Environmental Studies
and 0.5 credit from:
- ANTB01H3 Political Ecology*
- GGRA03H3 Cities and Environments
- POLA01H3 Critical Issues in Politics I
- POLA02H3 Critical Issues in Politics II

- POLB80H3 Introduction to International Relations I
- POLB90H3 Comparative Development in International Perspective
- POLB91H3 Introduction to Comparative Politics

and 0.5 credit from:

- ANTA02H3 Introduction to Anthropology: Society, Culture and Language
- FSTA01H3 Foods That Changed the World
- FSTA02H3 Food Futures: Confronting Crises, Improving Lives
- IDSA01H3 Introduction to International Development Studies
- MGEA01H3 Introduction to Microeconomics
- MGEA05H3 Introduction to Macroeconomics
- WSTA01H3 Introduction to Women's and Gender Studies

Core Courses (1.5 credits)

ESTB04H3 Addressing the Climate Crisis
ESTB05H3 Climate Science for Everyone

and 0.5 credit from:

- EESB03H3 Principles of Climatology*
- EESB04H3 Principles of Hydrology
- EESB18H3 Natural Hazards
- ESTB02H3/ GGRB18H3 Whose Land? Indigenous-Canada-Land Relations
- ESTB03H3 Back to the Land: Restoring Embodied and Affective Ways of Knowing
- GGRB21H3 Political Ecology: Nature, Society and Environmental Change
- IDSB02H3 Development and Environment
- STAB22H3 Statistics I (or equivalent)

Applications and Skills (4.5 credits):

ESTC35H3 Environmental Science and Technology in Society
ESTC36H3 Knowledge, Ethics and Environmental Decision-Making
ESTC37H3 Energy and Sustainability
EESD17Y3/ ESTD17Y3 Cohort Capstone Course in Environmental Studies
ESTD19H3 Risk

and 1.0 credit from:

- ESTC40H3 Technical Methods for Climate Change Mitigation
- EESD16H3/ ESTD16H3 Project Management in Environmental Studies
- ESTD20H3 Integrated Natural Resource and Climate Change Governance
- EESC34H3/ ESTC34H3 Sustainability in Practice

and 0.5 credit from:
- ANTB36H3 Anthropology of the End of the World
- EESC38H3/ ESTC38H3 The Anthropocene*
- GGRC24H3 Socio-Natures and the Cultural Politics of 'The Environment'
- GGRC26H3 Geographies of Environmental Governance
- GGRC28H3 Indigenous Peoples, Environment and Justice
- GGRC44H3 Environmental Conservation and Sustainable Development
- POLC53H3 Canadian Environmental Policy
- SOCC37H3 Environment and Society*
- EESD06H3 Climate Change Impact Assessment*
- EESD13H3 Environmental Law, Policy and Ethics
- POLD89H3 Global Environmental Politics
- PSCD11H3 Communicating Science: Film, Media, Journalism, and Society
- EESD09H3/ EESD10Y3 Research Project in Environmental Science
- ENGC59H3 Literature and the Environment

*This course requires pre-requisites that are not part of this program. Check all pre-requisites carefully.

7 Rationale for Program as Designed

7.1 Rationale for Admission Requirements

a) Discuss the appropriateness of the program's admission requirements as they are articulated in section 6 above, given the program's objectives and program-level learning outcomes.
b) Provide a sufficient explanation of alternative requirements, if applicable, for admission into a graduate, second-entry or undergraduate program, e.g., minimum grade point average, additional languages or portfolios, and how the program recognizes prior work or learning experience.

The proposed program will have no admission requirements; enrolments will be unlimited. The removal of enrolment barriers is appropriate given the program's objective to establish a foundation of knowledge in environmental studies and interdisciplinary approaches to climate change and the program-level learning outcome of understanding the interdisciplinary nature

of climate change integrating environmental studies, environmental sciences, and social sciences. Given the foundational objectives of the program and the interdisciplinary design focused on intake of a wide range of students with diverse academic backgrounds, admission requirements are not necessary and, furthermore, would be difficult to apply consistently across these varied academic backgrounds.

7.2 Rationale for Program Structure

For All New Programs

a) Discuss the appropriateness of the program's structure and requirements (as stated in Section 6) to meet its objectives and program-level learning outcomes, including the structure and requirements of any identified streams (undergraduate), fields or concentrations (graduate). Please include a discussion of the program's planned/anticipated class sizes.
b) Appropriateness of the program's structure, requirements and program-level learning outcomes in meeting the institution's applicable undergraduate or graduate Degree Level Expectations.
c) State the proposed mode(s) of delivery of the program. Discuss the appropriateness of the mode(s) of delivery (i.e., means or medium used in delivering a program; e.g., lecture format, distance, online, synchronous/asynchronous, problem-based, compressed part-time, flex-time, multi-campus, inter-institutional collaboration or other non-standard forms of delivery) to facilitate students' successful completion of the program-level learning outcomes
d) Discuss the ways in which the curriculum addresses the current state of the discipline or area of study and is appropriate for the level of the program
e) Please provide details on any experiential learning that is part of the program, including confirmed and interested partners, duration of experiential learning component in a program, and anticipated number of placements.

Program Learning Outcomes

Table 3: Bachelor's DLEs, Program Learning Outcomes and Requirements

Degree Level Expectations	Program Learning Outcomes
Expectations: The Honours Bachelor of Arts is awarded to students who have demonstrated the following program learning outcomes:	

Degree Level Expectations	Program Learning Outcomes
1. Depth and Breadth of Knowledge Depth of Knowledge: Programs of study will attain depth through a progression of introductory, core and specialized courses. Specialized courses will normally be at the C and D levels. Breadth of Knowledge: In the course of their studies, students will gain an appreciation of the variety of modes of thinking, methods of inquiry and analysis, and ways of understanding the world that underpin different intellectual fields. Through courses within or outside of their programs of study, students will be exposed to an appropriate balance of: the arts, literature and history of human cultures, the social and behavioral sciences, the natural sciences, and quantitative reasoning.	PLO1: Recognize and explain the interdisciplinary nature of climate change integrating environmental studies, environmental sciences, and social sciences. PLO2: Explain the human dimensions of climate change, as well as the scientific basis of climate change. PLO3: Demonstrate specialized expertise in aspects of the climate change challenge in accordance with their interests and career goals, including scientific, political, social and cultural aspects and/or physical science aspects of climate change.
2. Knowledge of Methodologies Students will have a working knowledge of different methodologies and approaches relevant to their area of study. They will be able to evaluate the efficacy of different methodologies in addressing questions that arise in their area of study.	PLO4: Apply interdisciplinary methodologies (qualitative and/or quantitative) to analyze complex environmental problems.
3. Application of Knowledge Within their area of study students will be able to frame relevant questions for further inquiry. They will be familiar with or will be able to seek the tools with which they can address such questions effectively.	PLO5: Apply knowledge to respond to evolving environmental problems. PLO6: Critique and compare climate change mitigation and adaptation policy.
4. Awareness of the Limits of Knowledge Students will gain an understanding of the limits to their own knowledge. They will also	PLO7: Demonstrate basic knowledge of the fundamental role of uncertainty in environmental science research and practice

Degree Level Expectations	Program Learning Outcomes
gain an appreciation of the uncertainty, ambiguity, and limits to our collective knowledge and how these might influence analyses and interpretations.	by understanding the different types of uncertainty and their relative importance for scientists, stakeholders, policy makers, and the public.
5. Communications Skills Students will be able to communicate information, arguments, and analyses accurately and reliably, both orally and in writing. Students will learn to read and to listen critically.	PLO8: Communicate coherently, concisely, and with clarity. PLO9: Translate complex ideas effectively to both scientific and lay audiences.
6. Autonomy and Professional Capacity In a broader context, the education students receive while pursuing their degrees has three further goals: to give students the skills and knowledge they need to become informed, independent and creative thinkers; to instill the awareness that knowledge and its applications are influenced by and contribute to society; and to lay the foundation for learning as a life-long endeavour.	PLO10: Understand their role and responsibilities in a team setting, and interact with team members in an ethical and professional manner.

How the Program Supports its Objectives and Learning Outcomes

To ensure students meet these program learning outcomes, the Major in Climate Change Studies is designed around a core environmental studies interdisciplinary approach with a focus on application and electives designed to allow for further specialization. Below is the description of the pathway that details the program requirements and their alignment with the program learning outcomes.

The *Foundations* phase of the program focuses on introductory survey courses to prepare students to understand and address the social, economic, political, and ecological aspects of

the climate crisis (program objective 1). Students are required to take survey courses in interdisciplinary environmental science (EESA01H3 Introduction to Environmental Science), physical science (EESA06H3 Introduction to Planet Earth), and interdisciplinary social sciences (ESTB01H3 Introduction to Environmental Studies) in order to provide foundational content knowledge **(PLO1)**, an introduction to a range of methodologies and epistemologies **(PLO4),** and an introductory framework for understanding uncertainty in environmental science research and practice **(PLO7)**. To provide a basis on which to build expertise in the human dimensions of the climate crisis (program objective 2), the students then choose one course from a bucket of electives focused on politics (e.g., ANTB01H3 Political Ecology, POLA01H3 Critical Issues in Politics I etc.) and one course from a bucket of electives focused on varied social sciences (e.g. IDSA01H3 Introduction to International Development Studies, MGEA01H3 Introduction to Microeconomics, WSTA01H3 Introduction to Women's and Gender Studies etc.). This also addresses **PLO3** by requiring to students to begin to specialize. These courses also offer additional introductions into a range of qualitative and/or quantitative methods to analyze complex environmental and social problems, either of which would address the learning outcomes of this program **(PLO4)**.

In the *Core Courses* phase of the program, students build on this foundation by delving more specifically into content knowledge focused on the human dimensions of climate change (ESTB04H3 Addressing the Climate Crisis) and scientific literacy on climate change (ESTB05H3 Climate Science for Everyone) in required courses of approximately 80 students with tutorials **(PLO1** and **PLO2)**. These two core courses are designed to provide training in interdisciplinary methodologies to analyze problems **(PLO4)** and focus on building student's capacity to apply knowledge to respond to evolving environmental and social problems **(PLO5)**. ESTB04H3 Addressing the Climate Crisis also introduces key concepts related to climate change policy and governance to work towards **PLO6** and includes a focus on climate change communication in service of **PLO8 and PLO9** (see assessment section for further details)**.** The required courses in the *Core* Courses phase also include teamwork and other professional soft skill development **(PLO10).** The *Core Courses* phase clearly demonstrates that the proposed Major is structured so that students will gain expertise in both physical science and social science (program objectives 2 and 3) and be able to pursue select electives consistent with their experience and interests **(PLO3)**.

Through the selection of elective courses in the program, students will have the opportunity to focus on aspects of the climate change challenge in accordance with their interests and career goals, including scientific, political, social and cultural aspects (e.g., politics, Indigenous studies, policy, law, development studies etc.), and/or physical science aspects of climate change (e.g.,

climatology, climate change impact assessment etc.) according to their further education and career goals. In the *Core Courses* phase, students start this specialization by selecting one course from an elective bucket that is intentionally designed to present an interdisciplinary range of options to enable varied specializations (e.g., from EESB04H3 Principles of Hydrology to GGRB21H3 Political Ecology: Nature, Society and Environmental Change to ESTB03H3 Back to the Land: Restoring Embodied and Affective Ways of Knowing). Students pick from an interdisciplinary bucket of electives to further develop specialized expertise and methodological skills (e.g., in quantitative, applied environmental analysis with EESB03H3 Principles of Climatology or critical social sciences with GGRB21H3 Political Ecology: Nature, Society and Environmental Change etc.) **(PLO3 and PLO4)**. In addition, this interdisciplinary elective approach allows students to combine their studies with other Majors or minors more easily since students have opportunities to find synergistic overlaps between the Major and other programs. For example, a student combining the program with a Major in Political Science interested in international development might select the development studies course while a student combining the Major with Environmental Science might choose the statistics course given the synergies with their respective other programs.

Throughout the program, students may select electives in areas of:

- Politics (e.g., POLA01H3 Critical Issues in Politics I, GGRB21H3 Political Ecology: Nature, Society and Environmental Change, POLC53H3 Canadian Environmental Policy, etc.)
- Development (e.g., IDSA01H3 Introduction to International Development Studies, IDSB02H3 Development and Environment, GGRC44H3 Environmental Conservation and Sustainable Development, etc.)
- Physical sciences (e.g., EESB03H3 Principles of Climatology*, EESB04H3 Principles of Hydrology; STAB22H3 Statistics I, EESC38H3/ ESTC38H3 The Anthropocene*, etc.)
- Communication and culture (e.g., ANTA02H3 Introduction to Anthropology: Society, Culture and Language, PSCD11H3 Communicating Science: Film, Media, Journalism, and Society, etc.)
- Indigenous studies (e.g., ESTB02H3/ GGRB18H3 Whose Land? Indigenous-Canada-Land Relations, GGRC28H3 Indigenous Peoples, Environment and Justice etc.).

In the *Application and Skills* phase of the program, students are required to take smaller seminar courses that continue to build on the foundation of knowledge in environmental studies and interdisciplinary approaches to climate change achieved in the previous phases (e.g., ESTC37H3 Energy and Sustainability and ESTD19H3 Risk) **(PLO1)**. Students also gain core training in environmental studies methodological skills such as systems thinking and

formulating climate change mitigation and adaptation policy (ESTC37H3 Energy and Sustainability) **(PLO4 and PLO 6)** and develop expertise in linking science and policy (ESTC35H3 Environmental Science and Technology in Society) **(PLO6)**, and techniques for decision-making in contentious contexts (ESTC36H3 Knowledge, Ethics and Environmental Decision-Making) **(PLO6).** ESTC35H3 Environmental Science and Technology in Society and ESTC36H3 Knowledge, Ethics and Environmental Decision-Making support learning outcomes on critiquing and comparing policy and governance approaches **(PLO6)** and related to developing a more sophisticated understanding of the role of uncertainty in the context of the science-policy interface **(PLO7).** Students gain professional skills in working in teams through the required courses during this phase of the program as well **(PLO10).** Several required courses in this phase of program continue to build skills in climate change and environmental communication, including ESTC37H3 Energy and Sustainability, ESTC36H3 Knowledge, Ethics and Environmental Decision-Making, and EESD17Y3/ ESTD17Y3 Cohort Capstone Course in Environmental Studies **(PLO8 and PLO9).**

In addition to these required courses, students must select from two elective buckets in the *Application and Skills* phase. The first bucket is focused on a series of courses focused specifically on climate change. Students must pick two courses from this list which offers opportunities for students to develop nuanced and specialized climate change content knowledge through small C- and D-level courses focused on a particular area within the topic of climate change (e.g., ESTC40H3 Technical Methods for Climate Change Mitigation, etc.) **(PLO 1 and PLO2)**. Students also develop more sophisticated skills in quantitative or qualitative analysis of environmental and social problems through these electives as well **(PLO4)**. The second elective bucket in this phase is the culmination of specialization in this program and it continues to offer an interdisciplinary set of C- and D-level courses so that students can specialize in scientific, political, social and cultural aspects and/or physical science aspects of climate change **(PLO3)**.

Application to real social and environmental problems is central to the *Application and Skills* phase of the program. In EESD17Y3/ ESTD17Y3 Cohort Capstone Course in Environmental Studies, groups of students work on transdisciplinary projects in partnership with real world clients **(PLO5)**. These groups of students work with an Environmental Studies faculty member and community partners for an experiential learning experience that applies learning developed throughout the four-year program on a climate change themed research project. For example, students may work on a group research project for a research question defined by a community partner in Scarborough working on climate change and equity (e.g., informing and expanding food and climate community education programs delivered as part of community

garden and food security programming at a community centre). This capstone course will focus on achieving the culmination of several key learning outcomes not only in integrating climate change content **(PLO2)** and drawing on interdisciplinary methods for analyzing environmental problems developed throughout the program **(PLO4)**, but also skill building in working in professional teams **(PLO10)**, translating ideas to lay audiences **(PLO9)**, and communicating with clarity **(PLO8)**.

This curriculum addresses the current state of the discipline of environmental studies where leading-edge work emphasizes the fundamentally interdisciplinary nature of environmental problems. As the previous section has described, this program is designed to develop knowledge and skills across the social, economic, ecological, and political components of climate change and give students the foundation of knowledge across these dimensions that is necessary to respond to the developments of climate change. This section has also described how the curriculum is appropriate for the level of the program by describing the scaffolding built into the design so that students are introduced to key knowledge, concepts, and methodologies, and then build on this foundation to be able to analyze and explain the human dimensions of climate change and develop key interdisciplinary skills to understand and address complex problems.

Mode of Delivery

The program will be delivered in person. In-person program delivery is appropriate because classroom experiences in the program involve discussion, peer-to-peer interactive learning, and in several instances, many opportunities for experiential learning in partnership with external organizations and community partners. Course requirements (8.5 credits) are commensurate with other major programs in the department. Dr. Laura Tozer will serve as the program director.

U of T strives to be a fully accessible university. Important examples of this exist within the DPES's infrastructure. This includes the fully accessible Environmental Science and Chemistry building, where students will mainly be located.

Experiential Learning

Consistent with their research activities, the proposed Major will offer opportunities for experiential learning projects that build upon the relationships that the DPES's Environmental Studies faculty hold with external partners as part of their research and applications work. As such, the DPES environmental studies faculty will offer students in the proposed program an array of different potential experiential learning opportunities through faculty research and experiential learning relationships in, for example, New Brunswick, Nepal, Scarborough, and across Canada. For example, in EESD17Y3/ ESTD17Y3 *Cohort Capstone Course in Environmental Studies*, groups of students work on interdisciplinary projects in partnership with real world clients.

Recently approved new courses that are intended to support this program will also integrate distinctive experiential learning opportunities. For example, ESTB04H3 Addressing the Climate Crisis and ESTC37H3 Energy and Sustainability have an experiential learning component where students develop climate change communication videos and outreach materials in partnership with climate change communication non-for-profit organizations. Members of the Experiential Learning Team at UTSC (e.g., the Department of Community Partnerships and Engagement and the Integrated Learning Experience Team) have been consulted and are working with course instructors to develop these new elements.

8 Assessment

a) Articulate and comment on the appropriateness of the methods for assessing student achievement of the program-level learning outcomes and degree level expectations
b) Articulate and comment on the appropriateness of the plans to monitor and assess:
    1. The overall quality of the program
    2. Whether the program is achieving in practice its proposed objectives
    3. Whether its students are achieving the program-level learning outcomes
    4. How the resulting information will be documented and subsequently used to inform continuous program improvement.

Methods to Assess Student Achievement

A range of methods are used to assess student achievement of program learning outcomes (PLOs) in this program, including participation in classroom discussions, written and oral

assignments, knowledge synthesis reports of various formats, and reflexive learning journals. Students are assessed depth, breadth, and application of knowledge of applied environmental issues, critical thinking skills, and oral and written communication skills appropriate to the undergraduate level through these papers, reports, and presentations. Midterm and final exams are used in courses as well. Courses such as EESD17Y3/ ESTD17Y3 Cohort Capstone Course in Environmental Studies use one-on-one meetings to mentor and assess student engagement and quality of work in capstone projects. Table 4 shows how these assessment methods will be used to assess the achievement of the PLOs.

Table 4. Assessment Methods Used to Assess the Achievement of PLOs in the Climate Change Studies Major Program

	Participation in classroom discussions	Written assignments	Knowledge synthesis reports	Reflexive learning journals	Presentations	Exams	Capstone project
PLO1: Recognize and explain the interdisciplinary nature of climate change integrating environmental studies, environmental sciences, and social sciences.	X	X	X		X	X	X
PLO2: Explain the human dimensions of climate change, as well as the scientific basis of climate change.	X	X	X			X	X
PLO3: Demonstrate specialized expertise in aspects of the climate change challenge in accordance with their interests and careers goals, including scientific, political, social and cultural aspects and/or physical science aspects of climate change.	X	X	X			X	X
PLO4: Apply interdisciplinary methodologies (qualitative and/or quantitative) to analyze complex environmental and social problems.		X	X		X	X	X
PLO5: Apply knowledge to respond to evolving environmental and social problems.	X	X	X	X	X	X	X
PLO6: Critique, compare, and develop climate change mitigation and adaptation policy and governance.	X	X	X	X	X		
PLO7: Demonstrate basic knowledge of the fundamental role of uncertainty in environmental science research and practice by understanding the different types of uncertainty and their relative importance for scientists, stakeholders, policy makers, and the public.		X			X	X	
PLO8: Communicate coherently, concisely, and with clarity.		X	X		X		X
PLO9: Demonstrate the ability to translate complex ideas effectively to both scientific and lay audiences.		X			X		X
PLO10: Understand their role and responsibilities in a team setting, and interact with team members in an ethical and professional manner.				X			X

In the *Foundations* phase of the program, the introductory survey courses use written assignments and exams to assess knowledge content. Moving forward into the *Core Courses* phase, courses continue to use exams and written assignments and focus not only on knowledge content but also application and synthesis of knowledge to analyze environmental and social problems. Written communication abilities are assessed through student participation in course assignments (e.g., reports or research papers, critical analysis papers on climate change policy or action). In smaller courses and tutorials during the *Core Courses* phase, assessments include participation in class discussions to assess degree of mastery of knowledge content as well as to assess ability to apply knowledge.

In the *Application and Skills* phase, discussions, written assignments, exams, and knowledge synthesis reports are used to assess grasp of increasingly specialized climate change knowledge. This phase of the program uses these assessments to evaluate ability to apply knowledge to complex environmental problems as well. Effective communication skills are assessed through student participation in course assignments, including through written assignments aimed at a range of audiences (e.g., blog posts, professional reports, policy analyses, essays). The *Application and Skills* phase includes application through experiential learning, which is assessed through reflexive learning journals where students respond to prompts that ask them to reflect on experiential learning and, sometimes, the development of teamwork skills, and apply learning to content from the courses or broader program. A culminating assessment for this program is participation in the final group project in EESD17Y3/ ESTD17Y3 *Cohort Capstone Course in Environmental Studies*, where students work on projects in partnership with real world clients. Assessment of the capstone includes written, oral, and one-on-one faculty meeting components.

Ongoing Program Monitoring and Assessment

DPES has a number of common practices to ensure student success in our programs. A committee of faculty members from DPES will hold an annual meeting to assess the program. This assessment will take into account graduation rates and attrition numbers in the program and may consider course evaluations. We will build evaluation of partner experiences into experiential learning in courses, where faculty members will elicit feedback from partners. We will monitor the program over time using analyses of graduation rates, the grade spread of a graduating cohort, and other analyses that we will conduct in partnership with the Registrar's office (e.g., which other programs students most often combine with the Climate Change

Studies program). We will integrate the program into the next cyclical review of the department.

9 Consultation

Describe consultation with internal (faculty, students, cognate units, etc., as appropriate) and external stakeholders (alumni, community or professional organizations, etc., as appropriate).

Within DPES

Development of this proposal began in the 2020/2021 academic year through the DPES Climate Change Program Working Committee, which met to discuss undergraduate offerings on climate change. Feedback was received from Working Committee members and the meetings held on February 19th 2021 and March 12th 2021 specifically discussed this proposal. There was wide consultation with DPES faculty through the Curriculum Committee as well in 2021-2022. The final proposal was approved at the DPES Curriculum Committee meeting in September 2024.

At UTSC

Feedback received from UTSC Department of Political Science and Department of Human Geography has been positive with small changes made as a result in course requirements. Several of their courses are included as elective options in the Climate Change Studies program.

The proposal was presented to the UTSC Campus Curriculum Committee in October 2021. Reception was positive with comments focused on requesting permission to add the new DPES courses as electives to other programs and to notify DPES of new courses that could be electives in this program (e.g., in economics and psychology).

Feedback was received from the Office of the Dean at UTSC in January 2022 and has been ongoing since that time.

32 students in ESTB01H3 were surveyed in Fall 2022 and 69% indicated definitely or probably yes when asked; “Given the opportunity, would you consider the Climate Change Studies Major instead of or in addition to your current program of study”.

The Food Studies faculty and programs at UTSC moved into DPES in July 2024. Based on consultations with the Food Studies group in September 2024, we have added two food studies (FST) courses to this program.

An updated version of the program proposal, illustrating changes made based on the recommendations of the review report has been shared with the Office of the Registrar for feedback in late April 2025. The proposal was reviewed by the Registrar and Assistant Dean, Strategic Enrolment Management, and the Convocation & Student Records Coordinator. As a result of this review, section 7.1 (Rationale for Admission Requirements) of the proposal has been updated to reflect that unlimited programs can be selected at any time on ACORN and do not require students to have completed their first 4.0 credits. As the program is launched, the Registrar's Office and the department will continue to work with cognate units offering electives to monitor course availability and any enrolment restrictions to ensure that students enrolled in the new program have access to electives that are connected to it.

Across the Wider University

The Office of the Vice-Provost, Academic Programs convened a consultation meeting on May 11th 2023 including representatives from the UTSC Office of the VP Academic and Dean, VP Academic Programs Office, Academic Change, University Registrar, Office of the Vice-Provost, Faculty and Academic Life, Office of the Vice-Provost, Students and Student Policy Advisor, and Academic Planning & Analysis. Feedback from this meeting has been addressed in this proposal.

The Chair of the DPES contacted the UTSC and UTM Geography chairs about the proposed major in Fall 2022. These chairs were contacted since there are some similarities with the geography (arts) programs at both UTSC and UTM if the students select environmental courses. Both chairs responded with no concerns. The Chair of the DPES also consulted all departments with elective courses included in the program during Winter 2023. The School of the Environment in the Faculty of Arts & Science has also been consulted. No issues were raised. The Chair of DPES also consulted with the UTSC Department of Sociology in Winter 2024 and shared this climate change studies major proposal.

The proponents met with the Centre for Teaching and Learning, the Department of Community Partnerships and Engagement, the Integrated Experience Learning team on October 6, 2022 to discuss EL components of the major and new courses, including resource needs and additional EL opportunities.

Additional feedback was received from the Office of the Vice-Provost, Academic Programs in May 2024 and has been addressed in this proposal.

In addition, the Faculty of Arts & Science, the University of Toronto Mississauga, and the John H. Daniels Faculty of Architecture, Landscape, and Design had a chance to review this proposal in Fall 2024.

In the Faculty of Arts & Science, this proposal was shared with 25 academic units, including the Departments of Anthropology, Chemistry, Earth Sciences, Ecology & Evolutionary Biology, Economics, Geography & Planning, History, Philosophy, Physics, Political Science, Psychology, and more for feedback.

In the University of Toronto Mississauga, this proposal was shared with five academic units including the Departments of Chemical & Physical Sciences; Geography, Geomatics and Environment; Political Science; Sociology; and Biology.

Comments were supportive and offered suggestions to correct oversights pertaining to current program offerings offered by consulted academic units. Clarifications were also provided regarding the administration of the proposed Major.

The proposal was also shared with the Faculty of Applied Science & Engineering for review in Fall 2024. The division did not have any feedback on the proposal.

Consultation regarding this proposal was undertaken with the Tri-campus Deans (3CD) Group via email from November to December 2024. 3CD-level approval from the University of Toronto Mississauga was received on December 11, 2024. 3CD-level approval from the Faculty of Arts & Science was received on December 12, 2024.

10 Resources

10.1 Faculty

Please fill out the table below. In a separate appendix provide all CVs of all faculty in the table.

Table 4: Faculty Complement (please list alphabetically)

Name	**Unit of Primary Budgetary Appt and %**	**Unit of Other Budgetary Appt and % (if applicable)**	**Graduate Faculty Membership Status** (e.g., Associate/ Full privileges)	**Commitment to Other Programs** (Please list other programs in which the person routinely teaches/ supervises.)	**Nature of Contribution to This Program** (Course instructor [CI], thesis supervision [TS], clinical or practice supervisor [C/PS]. Please list the courses each member will teach.)
Tenure Stream: Full					
George Arhonditsis	DPES, 100% (UTSC)	N/A	Full privileges in Department of Physical and Environmental Sciences (DPES) and Geography and Planning	Teaches courses in the Environmental Science major and courses in the graduate program	CI: EESD09H3/EESD10Y3
Carl Mitchell	DPES, 100% (UTSC)	N/A	Full privileges DPES and Geography and Planning	Teaches courses in the Environmental Science major and courses in the graduate program	CI: EESB04H3
Tenure Stream: Associate					

Name	Unit of Primary Budgetary Appt and %	Unit of Other Budgetary Appt and % (if applicable)	Graduate Faculty Membership Status (e.g., Associate/ Full privileges)	Commitment to Other Programs (Please list other programs in which the person routinely teaches/ supervises.)	Nature of Contribution to This Program (Course instructor [CI], thesis supervision [TS], clinical or practice supervisor [C/PS]. Please list the courses each member will teach.)
Nicole Klenk	DPES, 100% (UTSC)	N/A	Full privileges DPES and Geography and Planning	Teaches courses in the Environmental Studies major and the Certificate in Sustainability	CI: ESTC35H3, ESTC36H3
Tenure Stream: Assistant					
Adam Martin	DPES, 100% (UTSC)	N/A	Full privileges DPES and Geography and Planning	Program Director for the Global Environmental Change Specialist; teaches in the Environmental Science major	CI: EESA01H3
Laura Tozer	DPES, 100% (UTSC)	N/A	Full privileges DPES and Geography and Planning	Teaches courses in the Environmental Studies major	CI: ESTB04H3; ESTC37H3, Program Director for Climate Change Studies Major
Teaching Stream: Full					

Name	**Unit of Primary Budgetary Appt and %**	**Unit of Other Budgetary Appt and % (if applicable)**	**Graduate Faculty Membership Status** (e.g., Associate/ Full privileges)	**Commitment to Other Programs** (Please list other programs in which the person routinely teaches/ supervises.)	**Nature of Contribution to This Program** (Course instructor [CI], thesis supervision [TS], clinical or practice supervisor [C/PS]. Please list the courses each member will teach.)
N/A					
Teaching Stream: Associate					
Tanzina Mohsin	DPES, 100% (UTSC)	N/A	Associate DPES	Teaches in the Major in Environmental Science and supervises the Applied Climatology Minor	CI: EESB03H3
Karen Smith	DPES, 100% (UTSC)	N/A	Associate DPES	Program Director for the Masters of Environmental Science Program	CI: ESTB05H3
Teaching Stream: Assistant					
Jim MacLellan	DPES, 100% (UTSC)	N/A	Associate DPES	Program Director for the Environmental Studies Major; teaches courses in	CI: ESTB01H3; EESD17Y3; EESC34H3; ESTD19H3

Name	**Unit of Primary Budgetary Appt and %**	**Unit of Other Budgetary Appt and % (if applicable)**	**Graduate Faculty Membership Status** (e.g., Associate/ Full privileges)	**Commitment to Other Programs** (Please list other programs in which the person routinely teaches/ supervises.)	**Nature of Contribution to This Program** (Course instructor [CI], thesis supervision [TS], clinical or practice supervisor [C/PS]. Please list the courses each member will teach.)
				the Certificate for Sustainability	
Dan Weaver	DPES, 100% (UTSC)	N/A	Associate DPES		CI: ESTB05H3
Non-Tenure Stream (i.e., CLTA)					
N/A					
Sessional Lecturer					
Sessional Lecturer	N/A	N/A	N/A	N/A	EESA06H3
Others (please specify, i.e., adjunct, status only, clinical faculty, visiting or other as per U of T definitions)					
N/A					

All New Programs

Given the program's planned/anticipated class sizes (section 5) as well as its program level learning outcomes please discuss:

a) Participation of a sufficient number and quality of core (i.e., appointed) faculty who are competent to teach and/or supervise in and achieve the goals of the program and foster the appropriate academic environment.

Faculty who are currently supporting the existing Major program in Environmental Studies, as well as programs in Environmental Science will also support the proposed Major, including Laura Tozer (climate change politics, justice and governance), Nicole Klenk (environmental governance and knowledge production), Adam Martin (agroecosystems and global environmental change), Dan Weaver (physics and climate science), George Arhonditsis (biogeochemical modelling and watershed science), Carl Mitchell (biogeochemistry, hydrology, pollution), Jim MacLellan (climate change adaptation and decision support systems), Tanzina Mohsin (climatology), and Karen Smith (climate science). Of the nine faculty members, five are in the tenure-stream (Mitchell, Arhonditsis, Klenk, Tozer, and Martin) and four are teaching-stream (MacLellan, Mohsin, Smith and Weaver). Five faculty are post-tenure (Mitchell, Arhonditsis, Klenk, Mohsin, Smith) and four faculty are pre-tenure (Tozer, Martin, MacLellan, Weaver). Faculty have expertise in and already integrate experiential learning into their classrooms, including Tozer, Klenk, and MacLellan (see the Experiential Learning sub-section in Section 7: Rationale for Program as Designed for more details). Laura Tozer will be Program Director for the Climate Change Studies major.

To meet the learning outcomes of this program, five courses have been created since 2022:

- ESTB04H3 Addressing the Climate Crisis (required)
- ESTB05H3 Climate Science for Everyone (required)
- ESTC37H3 Energy and Sustainability (required)
- ESTC40H3 Technical Methods for Climate Change Mitigation (optional)
- ESTD20H3 Integrated Natural Resource and Climate Change Governance (optional)

Required courses will be taught by existing faculty as part of their regular teaching load and will be cycled. All required courses are already offered through the existing workload of contributing faculty and existing stipendiary lecturers (see Table 4), except for ESTB05H3. ESTB05H3 Climate Science for Everyone will require a redistribution of workload so that it can

be taught by Smith and Weaver since it has not yet been offered. The department has a plan to accomplish this redistribution of workload to offer the course every year. DPES has a planned new hire in 2024-2025 that will also support this program in terms of delivering elective courses (e.g. ESTC40H3 Technical Methods for Climate Change Mitigation or ESTD20H3 Integrated Natural Resource and Climate Change Governance) and offering required courses during sabbaticals or other workload rotations. DPES successfully proposed this new faculty position (Tenure-track Assistant Professor Position in Sustainability and Justice) as part of the UTSC Canada Excellence Research Chair (CERC) Justice NEST project call for proposals. A search is currently in progress.

b) If applicable, discussion/explanation of the role and approximate percentage of adjunct and sessional faculty/limited term appointments used in the delivery of the program and the associated plans to ensure the sustainability of the program and quality of the student experience

EESA06H3, an elective course for the proposed program is being taught by a stipendiary lecturer this year, and that the department has a second faculty search underway as a part of UTSC's complement planning process who will teach this course when they are hired.

c) If required, provision of supervision of experiential learning opportunities.

Provision of Supervision of Experiential Learning Opportunities

There is no supervision of experiential learning opportunities outside of courses. All experiential learning is integrated into specific courses and supervision requirements are integrated into the workload of course instructors. See the Experiential Learning sub-section in Section 7: Rationale for Program as Designed for specific details about courses that include experiential learning.

d) Adequacy of the administrative unit's planned utilization of existing human, physical and financial resources, including implications for the impact on other existing programs at the University.

Additional Required Human Resources

The EST courses will be taught by existing faculty and the anticipated new tenure track hire as part of their regular teaching load and will be cycled. TA resources for some of our recently approved courses have been covered by the department's existing budget or supported by the Dean's Office. Additional resources may be required to support course growth to accommodate

additional students who will take the core EST courses. We will work with the Dean's Office to determine how the growing enrolment needs will correspond to the assessment of additional resources. We can deliver this program now with existing staff support. The department does have plans to hire an additional administrative staff, which may also become necessary to support growth in the program eventually.

Table 5: TA Support Required for EST Courses in the Program

Course Name	Total TA hours	NEW TA Hours
ESTB01H3 Introduction to Environmental Studies	140	0
ESTB04H3 Addressing the Climate Crisis	70	25
ESTB05H3 Climate Science for Everyone	70	70
ESTC35H3 Environmental Science and Technology in Society	70	30
ESTC36H3 Knowledge, Ethics and Environmental Decision-Making	70	10
ESTC37H3 Energy and Sustainability	30	30
ESTC40H3 Technical Methods for Climate Change Mitigation	40	40
ESTD16H3 Project Management in Environmental Studies	50	0
ESTD17Y3 Cohort Capstone Course in Environmental Studies	55	0
ESTD19H3 Risk	40	0
ESTD20H3 Integrated Natural Resource and Climate Change Governance	30	30
TOTAL	**665**	**235**

The department is expected to plan course timetabling in such a way that works within their budget whenever possible. The Dean's Office will work with the department to assess TA needs as a part of their overall budget planning.

e) Evidence that there are adequate resources to sustain the quality of scholarship and research activities produced by students, including library support, information technology support, and laboratory access.

Space and Other Resources

There are no unique space or infrastructure requirements. DPES and UTSC classrooms already provide adequate physical facilities to deliver this program.

For additional supporting resources, please see the following appendices:

- Appendix B: Library statement confirming the adequacy of library holdings and support for student learning.
- Appendix C: Standard statement concerning student support services.

f) If necessary, additional institutional or divisional resource commitments to support the program in step with its ongoing implementation.

The proposed program will be housed in and administered by the existing Department of Physical and Environmental Sciences; the current Chair is Dr. George Arhonditsis. There are no interdivisional teaching implications associated with the proposal. The proposed program will not affect any existing agreements with other institutions, and does not require the creation of any new agreements. This is not a proposal for a new Joint program.

11 Quality and Other Indicators

a) Evidence of the quality of the faculty (e.g., qualifications, funding, honours, awards, research, innovation and scholarly record; appropriateness of collective faculty expertise to contribute substantively to the program and commitment to student mentoring)
    1. The quality of the scholarship of the faculty, and the degree to which that scholarship is brought to bear in teaching
b) Any other evidence that the program and faculty will ensure the intellectual quality of the student experience.
c) Any additional indicators of quality identified by the division or academic unit
d) How the proposed program compares to the best in its field among international peer institutions

The DPES at UTSC is an ideal location for the proposed Major in Climate Change Studies. The academic design of the program draws upon the impressive expertise of DPES Environmental

Studies faculty, who are highly productive; several are considered to be international leaders in the fields of transdisciplinary climate adaptation and mitigation science, Indigenous community-based research and environmental decision analysis. Consistent with their research activities, the proposed major will offer opportunities for experiential learning projects that build upon the relationships that DPES Environmental Studies faculty hold with external partners as part of their research and applications work. As such, these faculty will offer students in the proposed program an extraordinary array of different potential experiential learning opportunities through faculty research and experiential learning relationships in, for example, New Brunswick, Nepal, Scarborough, and across Canada.

As discussed in Section 10: Resources of the proposal, there are nine faculty members that will support the proposed Major. These faculty include three core members from the Environmental Studies discipline group: two in the tenure stream and one in the teaching stream. The tenure-stream faculty are: Klenk (Associate Professor), and Tozer (Assistant Professor). MacLellan (Assistant Professor, Teaching Stream) is the teaching-stream faculty.

Since 2017, Klenk and Tozer have published over 50 peer-reviewed articles. These publications are in top international journals including: *Nature Sustainability*, *Science*, *Nature Climate Change*, *Current Opinion in Environmental Sustainability*, *Global Environmental Change*, *Annals of the American Association of Geographers*, and *Environmental Science and Policy*. The articles cut across the themes of climate change, climate change adaptation, climate change mitigation, and environmental risk among others. The Environmental Studies faculty collaborate with national and international colleagues and the group has particular expertise in transdisciplinary and community-based research approaches. As a new and growing group within DPES, this represents an impressive publication rate given the tenure-stream faculty are mostly early career. The rate of publication by each researcher depends on the nature of the research undertaken. Notably, the Environmental Studies discipline group excels in community-based research, which is slow-paced in the early stages of projects as best practice dictates heavy investment in relationship building with community collaborators to support co-production.

Table 6: Research Footprint of the Environmental Studies Faculty

Faculty Member	Peer Reviewed Publications since 2017	PhD Year	H index Since 2017	Total H index/years Since PhD
Nicole Klenk	31	2008	17	24 (1.6)
Laura Tozer	23	2018	10	11 (2.2)

Individually, Klenk is a leading scholar in co-production and transdisciplinary research. Her top cited publications include 'The politics of co-production: participation, power, and transformation' (*Current Opinion in Environmental Sustainability*, cited by 290), 'To co-produce or not to co-produce' (*Nature Sustainability*, cited by 209), and 'Taking stock of the assisted migration debate' (*Biological Conservation*, cited by 190). Tozer's top cited publications are 'Discourses of carbon neutrality and imaginaries of urban futures' (*Energy Research & Social Science*, cited by 93), 'Urban transformative potential in a changing climate' (*Nature Climate Change*, cited by 87), and 'Whose city? Whose nature? Towards inclusive nature-based solution governance' (*Cities*, cited by 57).

Faculty Bios

Nicole Klenk is an Associate Professor of Environmental Studies. Dr. Klenk's areas of expertise include science and technology studies, sustainability science and the ethics and politics of knowledge co-production. She has held a Fulbright Fellowship between 2014-16 to conduct transdisciplinary research in climate change adaptation across the Americas from which she published highly cited articles in important journals in her field: Science, Social Studies of Science and Wiley Interdisciplinary Reviews: Climate Change. She has been Editor-in-Chief of the tier 1 journal Environmental Science & Policy since 2020 (formerly Associate Editor for this journal 2017-2020). She has developed many international research and teaching collaborations since her appointment at U of T in 2013, more recently co-convening an inter-departmental (UTSC) as well as international and interdisciplinary workshop on teaching empathy in undergraduate education that builds upon her research as well as her work as part of the working circle that led UTSC's curriculum review.

Jim MacLellan is an Assistant Professor of Environmental Studies. Dr. MacLellan is a decision analyst in the broadest sense, possessing an extensive interdisciplinary background in ecology, economics, sociology, operations research, emergency response planning, and natural resource management (BA, BSc, MSc, PhD, RPF). His analytical skill set includes optimization/heuristic modeling, environmental assessment methodologies, as well as scientometrics. Throughout his career, he has developed and applied timely analysis within the Securities Industry, Forestry Sector, Climate Change Adaptation and the Institutional Research and Planning fields. Early theoretical work helped establish the international standard for wildfire Level of Protection analysis, as well as inform aviation procurement, and seasonal operational deployment strategies for the Government of Ontario. His current professional focus is Climate Adaptation, for which he has developed various scientometric tools, informing three national climate

adaptation assessments. Pioneering analytical work at the University of Toronto Scarborough, provided a foundation for campus-wide, environmental curriculum programming, helping guide the early growth of the Environmental Studies Program. Among various forms of professional service, Dr. MacLellan is also a member of the Board of Directors, of the Canadian Environmental Accreditation Commission, an extension of ECO Canada.

Laura Tozer is an Assistant Professor of Environmental Studies. Dr. Tozer directs the IMPACT Lab, which is a community-based and policy-engaged research group focused on environmental politics and governance to address climate change. She is an interdisciplinary environmental social scientist drawing on the fields of geography, environmental science, political science, and environmental studies. She has researched the planning and implementation of just, zero carbon, and resilient transitions in cities; the politics of transnational urban climate governance; and justice in the transition to renewable energy. She co-leads the Urban Just Transition research cluster at UTSC funded by a Cluster of Scholarly Prominence Program grant. She was formerly the Academic Associate Director of Community Engagement and EDI for the Climate Positive Energy Initiative at the University of Toronto (2022-2023), and is the co-founder and steering committee member for the Women in Sustainable Energy Research (WISER) global network. She is also an Associate Editor for Environmental Science and Policy. She is leading the development of the proposal for the new Major in Climate Change Studies.

Appendix A: Courses

Environmental Science

EESA01H3 - Introduction to Environmental Science
The scientific method and its application to natural systems. The physical and biological processes which drive ecosystem functions. Anthropogenic changes in ecosystem functions at local and global scales. Emphasis on the degradation of the atmosphere, soil, water and biological resources caused by human activity. Renewable and non-renewable resource sustainability. Laboratories will include hands-on field and lab related practical experience.
Exclusion: ENV100Y
Breadth Requirements: Natural Sciences

EESA06H3 - Introduction to Planet Earth
This general interest course explores the composition, structure and origin of the Earth and the tectonic, chemical and biological processes that have evolved over the last 4.5 billion years. It explains how planet "works" as a complex system. It provides a fundamental basis for understanding many of the environmental challenges faced by human societies especially natural hazards, water shortages, and climate change, and the importance of natural resources to our economy.
Exclusion: GGR100Y, GLG110H
Breadth Requirements: Natural Sciences

EESB03H3 - Principles of Climatology
This is an overview of the physical and dynamic nature of meteorology, climatology and related aspects of oceanography. Major topics include: atmospheric composition, nature of atmospheric radiation, atmospheric moisture and cloud development, atmospheric motion including air masses, front formation and upper air circulation, weather forecasting, ocean circulation, climate classification, climate change theory and global warming.
Prerequisite: [EESA06H3 or EESA09H3] and [MATA29H3 or MATA30H3]
Exclusion: GGR203H, GGR312H
Breadth Requirements: Natural Sciences

EESB04H3 - Principles of Hydrology

The water and energy balances; fluxes through natural systems. Process at the drainage basin scale: precipitation, evaporation, evapotranspiration and streamflow generation. The measurement of water fluxes, forecasting of rainfall and streamflow events. Human activity and change in hydrologic processes.
Prerequisite: EESA01H3 or EESA06H3 or any B-level EES course.
Exclusion: GGR206H
Breadth Requirements: Natural Sciences

EESB18H3 - Natural Hazards
This course is an investigation of the geological background and possible solutions to major hazards in the environment.
Environmental hazards to be studied include: landslides, erosion, earthquakes, volcanic eruptions, asteroid impacts, flooding, glaciation, future climate change, subsidence, and the disposal of toxic wastes. This may be of interest to a wide range of students in the life, social, and physical sciences; an opportunity for the non-specialist to understand headline-making geological events of topical interest. No prior knowledge of the Earth Sciences is required.
Exclusion: (EESA05H3), GLG103H
Breadth Requirements: Natural Sciences

EESC34H3/ ESTC34H3 - Sustainability in Practice
This course is intended for students who would like to apply theoretical principles of environmental sustainability learned in other courses to real-world problems. Students will identify a problem of interest related either to campus sustainability, a local NGO, or municipal, provincial, or federal government. Class meetings will consist of group discussions investigating key issues, potential solutions, and logistical matters to be considered for the implementation of proposed solutions. Students who choose campus issues will also have the potential to actually implement their solutions. Grades will be based on participation in class discussions, as well as a final report and presentation.
Same as ESTC34H3
Prerequisite: Any additional 9.5 credits
Exclusion: ESTC34H3
Breadth Requirements: Natural Sciences

EESD06H3 - Climate Change Impact Assessment*
Climate change over the last 150 years is reviewed by examining the climate record using both direct measurements and proxy data. Projection of future climate is reviewed using the results of sophisticated climate modeling. The climate change impact assessment formalism is

introduced and applied to several examples. Students will acquire practical experience in climate change impact assessment through case studies.
Prerequisite: EESB03H3
Breadth Requirements: Natural Sciences

EESD13H3 - Environmental Law, Policy and Ethics
This course reviews the laws and policies governing the management of natural resources in Canada. It examines the role of law and how it can work most effectively with science, economics and politics to tackle environmental problems such as climate change, conservation, and urban sprawl at domestic and international scales.
Prerequisite: Students must have completed at least 15.0 credits
Exclusion: LAW239H
Recommended Preparation: EESA10H3 and EESA11H3 and EESC13H3
Breadth Requirements: Natural Sciences
Note: Priority will be given to students enrolled in the Specialist and Major programs in Environmental Science. Additional students will be admitted as space permits.

EESD10Y3 - Research Project in Environmental Science
This course entails the design, implementation, and reporting of an independent and substantial research project, under the direct supervision of a faculty member. Research may involve laboratory, fieldwork, and/or computer-based analyses, with the final products being presented primarily as a written thesis, though other course work, such as oral presentations of student research, may also be required. All areas of environmental science research that are supported by existing faculty members are permissible. The course should be undertaken after the end of the 3rd Year, and is subject to faculty availability. Faculty permission and supervision is required.
Prerequisite: Permission of the course coordinator.
Exclusion: EESD09H3
Recommended Preparation: PSCB90H3 and EESC24H3
Course Experience: University-Based Experience
Note:
Students must apply to the course coordinator for admission into this course. Applications must be received by the end of August for enrolment in the fall semester. Applications should consist of a completed 1-page application form (available from the course instructor) that includes: 1. Student name, number, academic program, and current year of study; 2. A note of intent indicating the student's wish to enrol in EESD10Y3; 3. A brief description of the projects of interest to the student; 4. A list of relevant courses successfully completed by the student, as

well as any relevant courses to be taken during the concurrent session; 5. The confirmed name of the supervising professor, the date and method in which confirmation of their willingness to supervise was received (i.e., this must determined ahead of time, through personal correspondence with a professor). Generally, only students meeting the following requirements will be admitted to EESD10Y3: 1. A Cumulative Grade Point Average of 2.5 or higher; 2. Completion of at least 12.0 full credits (see point 4 below); 3. Completion of at least 1.5 full credits of C-level environmental science courses (see point 4 below); 4. For students in the Specialist/Specialist Co-op programs in Environmental Physics, completion of Year 3 and completion of at least 1.0 C-level PHY courses. Students who do not meet these criteria, are strongly encouraged to consider enrolment in PSCB90H3 and/ or EESC24H3 as an alternative to EESD10Y3. Once the course coordinator (or designate) has approved enrolment to EESD10Y3, they will sign the course enrolment form for submission to the registrar. Note that the course coordinator (or designate) is the only one permitted to give "permission of instructor" on this form.

Environmental Studies

ESTB01H3 - Introduction to Environmental Studies
This course introduces the Environmental Studies major and the interdisciplinary study of the environment through a team-teaching format. Students will explore both physical and social science perspectives on the environment, sustainability, environmental problems and their solutions. Emphasis will be on critical thinking, problem solving, and experiential learning.
Breadth Requirements: Social and Behavioural Sciences

ESTB02H3/GGRB18H3 - Whose Land? Indigenous-Canada-Land Relations
Introduces students to the geography of Indigenous-Crown-Land relations in Canada. Beginning with pre-European contact and the historic Nation-to-Nation relationship, the course will survey major research inquiries from the Royal Commission on Aboriginal Peoples to Missing and Murdered Indigenous Women and Girls. Students will learn how ongoing land and treaty violations impact Indigenous peoples, settler society, and the land in Canada.
Same as GGRB18H3
Prerequisite: 4.0 credits, including at least 0.5 credit in ANT, CIT, EST, GGR, HLT, IDS, POL or SOC
Exclusion: GGRB18H3

ESTB03H3/VPHB69H3 - Back to the Land: Restoring Embodied and Affective Ways of Knowing
In this course students will learn about sustainability thinking, its key concepts, historical development and applications to current environmental challenges. More specifically, students

will gain a better understanding of the complexity of values, knowledge, and problem framings that sustainability practice engages with through a focused interdisciplinary study of land. This is a required course for the Certificate in Sustainability, a certificate available to any student at UTSC.
Same as VPHB69H3.
Exclusion: VPHB69H3
Breadth Requirements: Social and Behavioural Sciences

ESTB04H3 - Addressing the Climate Crisis
Addressing the climate crisis is a profound challenge for society. This course explores climate change and what people are doing about it. This course emphasizes the human dimensions of the climate crisis. It introduces students to potential solutions, ethical and justice considerations, climate change policies and politics, and barriers standing in the way of effective action. With an emphasis on potential solutions, students will learn how society can eliminate greenhouse gas emissions through potential climate change mitigation actions and about adaptation actions that can help reduce the impacts of climate change on humans. This course is intended for students from all backgrounds interested in understanding the human dimensions of the climate crisis and developing their ability to explain potential solutions.
Prerequisite: Any 4.0 credits
Exclusion: GGR314H1
Breadth Requirements: Social and Behavioural Sciences

ESTB05H3 - Climate Science for Everyone
This course provides a conceptual and qualitative overview of climate science and a discussion of climate science misinformation. The course is intended to be accessible to arts and humanities students seeking to better understand and gain fluency in the physical science basis of climate change. Major topics will include the Earth's climate system, reconstruction of past climates, factors that impact the Earth's climate, climate measurements and models, and future climate change scenarios.
Prerequisite: Any 4.0 credits
Exclusion: GGR314H1, GGR377H5
Breadth Requirements: Natural Sciences
Course Experience: University-Based Experience
Note: Priority enrollment for students in the Environmental Studies Major Program in Climate Change (Arts)

ESTC35H3 - Environmental Science and Technology in Society

In this course students will engage critically, practically and creatively with environmental controversies and urgent environmental issues from the standpoint of the sociology of science and technology (STS). This course will contribute to a better understanding of the social and political construction of environmental science and technology.
Prerequisite: ESTB01H3
Breadth Requirements: Social and Behavioural Sciences
Note: Priority will be given to students enrolled in the Environmental Studies Program. Additional students will be admitted as space permits.

ESTC36H3 - Knowledge, Ethics and Environmental Decision-Making
Most environmental issues have many sides including scientific, social, cultural, ethical, political, and economic. Current national, regional and local problems will be discussed in class to help students critically analyze the roots of the problems and possible approaches to decision-making in a context of pluralism and complexity.
Prerequisite: ESTB01H3
Breadth Requirements: Social and Behavioural Sciences
Note: Priority will be given to students enrolled in the Environmental Studies Program. Additional students will be admitted as space permits.

ESTC37H3 - Energy and Sustainability
This course will address energy systems and policy, focusing on opportunities and constraints for sustainable energy transitions. The course introduces energy systems, including how energy is used in society, decarbonization pathways for energy, and the social and political challenges of transitioning to zero carbon and resilient energy systems. Drawing on real-world case studies, students will learn about energy sources, end uses, technologies, institutions, politics, policy tools and the social and ecological impacts of energy. Students will learn integrated and interdisciplinary approaches to energy systems analysis and gain skills in imagining and planning sustainable energy futures.
Prerequisite: 10.0 credits including ESTB04H3
Exclusion: ENV350H1
Breadth Requirements: Social and Behavioural Sciences

ESTC40H3 - Technical Methods for Climate Change Mitigation
Addressing the climate crisis requires designing and implementing effective climate change mitigation targets, strategies, policies and actions to eliminate human-caused greenhouse gas emissions. In this course, students will learn the various technical methods required in climate change mitigation. Students will explore the opportunities, barriers, and tools that exist to

implement effective climate change mitigation in the energy, industry, waste, and agriculture, forestry and land-use sectors. The emphasis of the course is on the technical methods that climate change mitigation experts require.
Prerequisite: 10.0 credits including ESTB04H3
Breadth Requirements: Natural Sciences

EESC38H3/ESTC38H3 - The Anthropocene*
"The Anthropocene" is a term that now frames wide-ranging scientific and cultural debates and research, surrounding how humans have fundamentally altered Earth's biotic and abiotic environment. This course explores the scientific basis of the Anthropocene, with a focus on how anthropogenic alterations to Earth's atmosphere, biosphere, cryosphere, lithosphere, and hydrosphere, have shifted Earth into a novel geological epoch. Students in this course will also discuss and debate how accepting the Anthropocene hypothesis, entails a fundamental shift in how humans view and manage the natural world.
Same as ESTC38H3
Prerequisite: ESTB01H3 and [1.0 credit from the following: EESB03H3, EESB04H3 and EESB05H3]
Exclusion: ESTC38H3
Breadth Requirements: Natural Sciences

EESD16H3/ESTD16H3 - Project Management in Environmental Studies
Students will select a research problem in an area of special interest. Supervision will be provided by a faculty member with active research in geography, ecology, natural resource management, environmental biology, or geosciences as represented within the departments. Project implementation, project monitoring and evaluation will form the core elements for this course.
Same as ESTD16H3
Prerequisite: At least 14.5 credits
Exclusion: ESTD16H3
Breadth Requirements: Natural Sciences

EESD17Y3/ESTD17Y3 - Cohort Capstone Course in Environmental Studies
This course is designed to provide a strong interdisciplinary focus on specific environmental problems including the socioeconomic context in which environmental issues are resolved. The cohort capstone course is in 2 consecutive semesters, providing final year students the opportunity to work in a team, as environmental researchers and consultants, combining knowledge and skill-sets acquired in earlier courses. Group research to local environmental

problems and exposure to critical environmental policy issues will be the focal point of the course. Students will attend preliminary meetings scheduled in the Fall semester.
Same as ESTD17Y3
Prerequisite: At least 14.5 credits
Exclusion: ESTD17Y3
Breadth Requirements: Natural Sciences
Course Experience: University-Based Experience

ESTD19H3 - Risk
A practical introduction to the concept of 'risk' as utilized in environmental decision-making. Students are introduced to risk analysis and assessment procedures as applied in business, government, and civil society. Three modules take students from relatively simple determinations of risk (e.g., infrastructure flooding) towards more complex, real-world, inclusive considerations (e.g., ecosystem impacts of climate change).
Prerequisite: 14.5 credits and STAB22H3 (or equivalent)
Breadth Requirements: Natural Sciences

ESTD20H3 - Integrated Natural Resource and Climate Change Governance
Climate change affects all sectors of society, natural ecosystems, and future generations. Addressing climate change, either in terms of mitigation or adaptation, is complex due to its pervasive scope, the heterogeneity of its impacts and the uneven distribution of responsibilities, resources and capacities to respond to it between different levels of government, stakeholder groups, and rightholder groups. This course focuses on nexus approaches in climate policy development and assessment across different public policy domains. In this course, students will learn about how different levels of government frame climate change and climate policy objectives, how they interact with stakeholders (e.g., economic interests and environmental groups) and rightholders (Indigenous people), and how to approach complexity in climate governance.
Prerequisite: 14.0 credits including ESTB04H3
Breadth Requirements: Social and Behavioural Sciences

Food Studies

FSTA01H3 - Foods That Changed the World
This course introduces students to university-level skills through an exploration of the connections between food, environment, culture, religion, and society. Using a food biography

perspective, it critically examines ecological, material, and political foundations of the global food system and how food practices affect raced, classed, gendered, and national identities.
Breadth Requirements: Social and Behavioural Sciences
Course Experience: University-Based Experience

FSTA02H3 - Food Futures: Confronting Crises, Improving Lives
This course provides innovation and entrepreneurship skills to address major problems in socially just food production, distribution, and consumption in the time of climate crisis. Students will learn to identify and understand what have been called “wicked problems” -- deeply complicated issues with multiple, conflicting stakeholders -- and to develop community-scale solutions.
Breadth Requirements: Social and Behavioural Sciences
Course Experience: University-Based Experience

Anthropology

ANTA02H3 - Introduction to Anthropology: Society, Culture and Language
How does an anthropological perspective enable us to understand cultural difference in an interconnected world? In this course, students will learn about the key concepts of culture, society, and language. Drawing upon illustrations of family, economic, political, and religious systems from a variety of the world's cultures, this course will introduce students to the anthropological approach to studying and understanding human ways of life.
Exclusion: ANT100Y, ANT102H
Breadth Requirements: Social and Behavioural Sciences

ANTB01H3 - Political Ecology
This course examines human-environmental relations from an anthropological perspective. Throughout the semester, we explore how peoples from different parts of the globe situate themselves within culturally constructed landscapes. Topics covered include ethnoecology, conservation, green consumerism, the concept of 'wilderness', and what happens when competing and differentially empowered views of the non-human world collide.
Prerequisite: ANTA02H3
Breadth Requirements: Social and Behavioural Sciences

ANTB36H3 - Anthropology of the End of the World
A cultural and comparative study of apocalyptic thought, practice, and representation around the world. It explores the conditions that inspire end times thinking and the uses it serves.

Cases may include: millenarian movements, Revelation, colonialism, epidemics, infertility, deindustrialization, dystopian science fiction, nuclear war, climate change, and zombies.
Prerequisite: ANTA02H3
Breadth Requirements: Social and Behavioural Sciences

Human Geography

GGRA03H3 - Cities and Environments
An introduction to the characteristics of modern cities and environmental issues, and their interconnections. Linkages between local and global processes are emphasized. Major topics include urban forms and systems, population change, the complexity of environmental issues such as climate change and water scarcity, planning for sustainable cities.
Exclusion: GGR107H, (GGR107Y), GGR117Y
Breadth Requirements: Social and Behavioural Sciences

GGRB21H3 - Political Ecology: Nature, Society and Environmental Change
This foundational course explores different conceptions of 'the environment' as they have changed through space and time. It also analyzes the emergence of different variants of environmentalism and their contemporary role in shaping environmental policy and practice.
Area of Focus: Environmental Geography
Exclusion: GGR222H, GGR223H, GGRC22H3
Breadth Requirements: Social and Behavioural Sciences

GGRC24H3 - Socio-Natures and the Cultural Politics of 'The Environment'
Explores the processes through which segments of societies come to understand their natural surroundings, the social relations that produce those understandings, popular representations of nature, and how 'the environment' serves as a consistent basis of social struggle and contestation.
Areas of focus: Environmental Geography; Social/Cultural Geography
Prerequisite: Any 8.0 credits
Recommended Preparation: GGRB21H3
Breadth Requirements: Social and Behavioural Sciences

GGRC26H3 - Geographies of Environmental Governance
This course addresses the translation of environmentalisms into formalized processes of environmental governance; and examines the development of environmental institutions at different scales, the integration of different forms of environmental governance, and the ways

in which processes of governance relate to forms of environmental practice and management.
Area of focus: Environmental Geography
Prerequisite: Any 8.0 credits
Recommended Preparation: GGRB21H3 or ESTB01H3
Breadth Requirements: Social and Behavioural Sciences

GGRC28H3 - Indigenous Peoples, Environment and Justice
Engages Indigenous perspectives on the environment and environmental issues. Students will think with Indigenous concepts, practices, and theoretical frameworks to consider human-environment relations. Pressing challenges and opportunities with respect to Indigenous environmental knowledge, governance, law, and justice will be explored. With a focus primarily on Canada, the course will include case studies from the US, Australia, and Aotearoa New Zealand
Prerequisite: Any 8.0 credits
Recommended Preparation: GGRB18H3/ESTB02H3
Breadth Requirements: Social and Behavioural Sciences

GGRC44H3 - Environmental Conservation and Sustainable Development
Deals with two main topics: the origins of environmental problems in the global spread of industrial capitalism, and environmental conservation and policies. Themes include: changes in human-environment relations, trends in environmental problems, the rise of environmental awareness and activism, environmental policy, problems of sustainable development.
Area of focus: Environmental Geography
Prerequisite: Any 8.0 credits
Exclusion: GGR233Y, (GGRB20H3)
Recommended Preparation: GGRB21H3 or IDSB02H3 or ESTB01H3
Breadth Requirements: Social and Behavioural Sciences
Course Experience: Partnership-Based Experience

International Development Studies

IDSA01H3 - Introduction to International Development Studies
History, theory and practice of international development, and current approaches and debates in international development studies. The course explores the evolution of policy and practice in international development and the academic discourses that surround it. Lectures by various faculty and guests will explore the multi-disciplinary nature of international development studies. This course is a prerequisite for all IDS B-level courses.

Breadth Requirements: Social and Behavioural Sciences

IDSA02H3/AFSA03H3 - Experiencing Development in Africa
This experiential learning course allows students to experience first hand the realities, challenges, and opportunities of working with development organizations in Africa. The goal is to allow students to actively engage in research, decision-making, problem solving, partnership building, and fundraising, processes that are the key elements of development work.
Same as AFSA03H3
Exclusion: AFSA03H3
Breadth Requirements: Social and Behavioural Sciences
Course Experience: Partnership-Based Experience

Economics for Management Studies

MGEA01H3 - Introduction to Microeconomics
Economic theory of the firm and the consumer. Although calculus is not used in this course, algebra and graphs are used extensively to illuminate economic analysis.
Note: This course is not for students interested in applying to the Specialists in Management and Economics leading to the B.B.A or for the Major program in Economics.
Exclusion: MGEA02H3, ECO100Y1, ECO105Y1, ECO101H5
Breadth Requirements: Social and Behavioural Sciences

MGEA05H3 - Introduction to Macroeconomics
Topics include output, employment, prices, interest rates and exchange rates. Although calculus is not used in this course, algebra and graphs are used extensively to illuminate economic analysis.
Note: This course is not for students interested in applying to the Specialists in Management and Economics leading to the B.B.A or for the Major program in Economics.
Exclusion: MGEA06H3, ECO100Y1, ECO105Y1, ECO102H5
Breadth Requirements: Social and Behavioural Sciences

Political Science

POLA01H3 - Critical Issues in Politics I
An introduction to crucial political issues of the day (e.g. globalization, migration, political violence, corruption, democracy, global justice, climate change, human rights, revolution, terrorism) and key concepts in Political Science. Students will be introduced to and

practice techniques of critical reading and analytic essay writing. Topics will vary by semester and professor.
Exclusion: POL101Y, POL115H, POL112H, POL113H, POL114H
Breadth Requirements: Social and Behavioural Sciences
Note: POLA01H3 and POLA02H3 are not sequential courses and can be taken out of order or concurrently.

POLA02H3 - Critical Issues in Politics II
An introduction to crucial political issues of the day (e.g. globalization, migration, political violence, corruption, democracy, global justice, climate change, human rights, revolution, terrorism) and key concepts in Political Science. Students will develop techniques of critical reading and analytic essay writing. Topics will vary by semester and professor.
Exclusion: POL101Y, POL115H, POL112H, POL113H, POL114H
Breadth Requirements: Social and Behavioural Sciences
Note: POLA01H3and POLA02H3 are not sequential courses and can be taken out of order or concurrently.

POLB80H3 - Introduction to International Relations I
This course examines different approaches to international relations, the characteristics of the international system, and the factors that motivate foreign policies.
Area of Focus: International Relations
Prerequisite: Any 4.0 credits
Exclusion: (POL208Y)
Breadth Requirements: Social and Behavioural Sciences

POLB90H3 - Comparative Development in International Perspective
This course examines the historical and current impact of the international order on the development prospects and politics of less developed countries. Topics include colonial conquest, multi-national investment, the debt crisis and globalization. The course focuses on the effects of these international factors on domestic power structures, the urban and rural poor, and the environment.
Area of Focus: Comparative Politics
Prerequisite: Any 4.0 credits
Exclusion: POL201H or (POL201Y)
Breadth Requirements: Social and Behavioural Sciences

POLB91H3 - Introduction to Comparative Politics

This course examines the role of politics and the state in the processes of development in less developed countries. Topics include the role of the military and bureaucracy, the relationship between the state and the economy, and the role of religion and ethnicity in politics.
Area of Focus: Comparative Politics
Prerequisite: Any 4.0 credits
Exclusion: (POL201Y)
Breadth Requirements: Social and Behavioural Sciences

POLC53H3 - Canadian Environmental Policy
This course examines the ideas and success of the environmental movement in Canada. The course focuses on how environmental policy in Canada is shaped by the ideas of environmentalists, economic and political interests, public opinion, and Canada's political-institutional framework. Combined lecture-seminar format.
Areas of Focus: Canadian Government and Politics; Public Policy
Prerequisite: (POLB50Y3) or [POLB56H3 and POLB57H3] or ESTB01H3 or [1.5 credits at the B-level in CIT courses]
Breadth Requirements: Social and Behavioural Sciences

POLD89H3 - Global Environmental Politics
Examines the challenges faced by humanity in dealing with global environmental problems and the politics of addressing them. Focuses on both the underlying factors that shape the politics of global environmental problems - such as scientific uncertainty, North-South conflict, and globalization - and explores attempts at the governance of specific environmental issues.
Area of Focus: International Relations; Public Policy
Prerequisite: [[POLB80H3 and POLB81H3] or ESTB01H3]] and [2.0 credits at the C-level in any courses]
Exclusion: POL413H1
Breadth Requirements: Social and Behavioural Sciences

Physical Sciences

PSCD11H3 - Communicating Science: Film, Media, Journalism, and Society
Communicating complex science issues to a wider audience remains a major challenge. This course will use film, media, journalism and science experts to explore the role of science and scientists in society. Students will engage with media and academic experts to get an insight into the ‘behind the scenes’ world of filmmaking, media, journalism, and scientific reporting.

The course will be of interest to all students of environmental science, media, education, journalism and political science.
Prerequisite: Any 14.5 credits
Exclusion: (PSCA01H3)
Breadth Requirements: Arts, Literature and Language

Sociology

SOCC37H3 - Environment and Society*
This course links studies in the classical sociology of resources and territory (as in the works of Harold Innis, S.D. Clark, and the Chicago School), with modern topics in ecology and environmentalism. The course will use empirical research and theoretical issues to explore the relationship between various social systems and their natural environments.
Prerequisite: [[SOCB05H3 or SOCB35H3] and [0.5 credit from the following: SOCB30H3, SOCB42H3, SOCB43H3, SOCB47H3]] or [any 8.0 credits and enrolment in the Major/Major Co-op in Public Policy] or [any 8.0 credits and enrolment in the Major Program in Environmental Studies or the Certificate in Sustainability]
Breadth Requirements: Social and Behavioural Sciences

Statistics

STAB22H3 - Statistics I
This course is a basic introduction to statistical reasoning and methodology, with a minimal amount of mathematics and calculation. The course covers descriptive statistics, populations, sampling, confidence intervals, tests of significance, correlation, regression and experimental design. A computer package is used for calculations.
Exclusion: ANTC35H3, MGEB11H3/(ECMB11H3), (POLB11H3), PSYB07H3, (SOCB06H3), STAB23H3, STAB52H3, STAB57H3, STA220H, (STA250H)
Breadth Requirements: Quantitative Reasoning

Women's and Gender Studies

WSTA01H3 - Introduction to Women's and Gender Studies
This course explores the intersection of social relations of power including gender, race, class, sexuality and disability, and provides an interdisciplinary and integrated approach to the study of women's lives in Canadian and global contexts. There is a strong focus on the development of critical reading and analytic skills.

Exclusion: (NEW160Y), WGS160Y, WGS101H
Breadth Requirements: Social and Behavioural Sciences

Appendix B: Library Statement

University of Toronto Libraries Report for
Climate Change Studies, Department of Physical and Environmental Sciences,
University of Toronto Scarborough, 2023

Context: The University of Toronto Library (UTL) system is the largest academic library in Canada and is currently ranked third among academic research libraries in North America.[3] The UTL has an annual acquisition budget of $36.2 million. Its research and special collections comprise over 12.5 million print volumes, 5.6 million microforms, over 5,200 print journal subscriptions, and rich collections of manuscripts, films, and cartographic materials. The system provides access to more than 3.2 million electronic books, 199,400 electronic journals, and rich primary source materials.[4] Numerous, wide-ranging collections, facilities and staff expertise reflect the breadth of research and instructional programs at the University and attract unique donations of books and manuscripts from around the world, which in turn draw scholars for research and graduate work.

Major North American Research Libraries					
	2016-2017	**2017-2018**	**2018-2019**	**2019-2020**	**2020-2021**
ARL RANK	**UNIVERSITY**	**UNIVERSITY**	**UNIVERSITY**	**UNIVERSITY**	**UNIVERSITY**
1	Harvard	Harvard	Harvard	Harvard	Harvard
2	Yale	Yale	Yale	Yale	Yale
3	Michigan	**Toronto (3rd)**	Columbia	**Toronto (3rd)**	**Toronto (3rd)**
4	Columbia	Columbia	**Toronto (4th)**	Columbia	MICHIGAN
5	New York	Michigan	Michigan	Michigan	COLUMBIA
6	**Toronto (6th)**				

Top 5 Canadian Universities in the ARL Ranking of Major North American Research Libraries				
2016-2017	**2017- 2018**	**2018- 2019**	**2019-2020**	**2020-2021**
RANK/UNIVERSITY	**RANK/UNIVERSITY**	**RANK/UNIVERSITY**	**RANK/UNIVERSITY**	**RANK/UNIVERSITY**
6/Toronto	**3/Toronto**	**4/Toronto**	**3/Toronto**	**3/Toronto**
29/Alberta	29/Alberta	30/Alberta	39/Alberta	29/British Columbia
37/British Columbia	33/British Columbia	40/British Columbia	40/British Columbia	39/Alberta

[3] As per Association of Research Libraries Statistics.

[4] Figures as of January 2022

40/McGill	38/McGill	47/McGill	51/McGill	42/MCGILL
75/Calgary	69/Manitoba	62/Ottawa	75/Calgary	70/CALGARY

Space and Access Services: The UTL's 40 libraries are divided into four administrative groups: Central, Departmental/local, Campus (UTM & UTSC) and Federated and Affiliated College Libraries. The UTL provides a variety of individual and group study spaces for students. Study space and computer facilities are normally available twenty-four hours, five days per week at one location, Robarts Library, with additional extended hours during study and exam periods at both UTSC and UTM. Web-based services and electronic materials are accessible at all times from campus or remote locations.

Equity, Diversity and Inclusion (EDI): EDI is a high priority at UTL. UTL has developed an EDI Statement, an Anti-Racism Statement and a Collections Diversity Plan. These statements are supported by a concrete action plan, which UTL is committed to achieving. UTL is prioritizing staff diversity, staff cultural competencies and awareness of systemic biases, building and improving relationships with Indigenous and other underrepresented communities, incorporating the principles of the Accessibility for Ontarians with Disabilities Act in its services, and working with the University's Equity Offices to remove barriers in support of our community members who seek to fulfill their academic, research, and employment goals.

Teaching, Learning & Research Support: Libraries play an important role in the linking of teaching and research in the University. To this end, information literacy instruction will be offered to assist in meeting the Climate Change Studies' degree level expectations in the ability to gather, evaluate and interpret information. Librarians collaborate with instructors on assignment design, provide student research consultations, and offer just-in-time student research help in person, by phone, or through online chat. Librarians are also available to support curriculum mapping initiatives. Special initiatives, such as the Libraries Undergraduate Research Prize, and an annual forum for student journal editors, extend information literacy beyond the classroom. These services align with the Association of College and Research Libraries (ACRL) *Framework for Information Literacy for Higher Education*.[5]

Program Specific Instructional Support: Instruction occurs at a variety of levels for the Department of Physical and Environmental Sciences (DPES) students and is provided by the faculty liaison librarian for DPES. The UTSC Library facilitates formal instruction integrated into the class schedule and hands-on tutorials related to course assignments. Of the specific new courses proposed for this major, ESTB04: Addressing the Climate Crisis, currently includes a formal research workshop taught by the DPES liaison. The Library, through its liaison librarians, also customizes feeds of library resources which appear prominently in Quercus course pages (e.g. ESTB04). Pending student needs and faculty interest, there is

[5] Association of College & Research Libraries. Framework for Information Literacy for Higher Education. ACRL, 2016. http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/infolit/Framework_ILHE.pdf

room for additional synchronous and/or synchronous support from the library for additional core courses. The liaison librarian has also historically participated in DPES teaching and curriculum committee meetings.

Collections: Many college and campus libraries collect materials in support of climate change studies; the largest collection of materials is centrally located in the Gerstein Science Information Centre. Collections are purchased in all formats to meet the variety of preferences and styles of our current students and faculty. The University of Toronto Library is committed to collecting both print and electronic materials in support of climate change studies at the University of Toronto Scarborough.

Journals: The Library subscribes to 25 of the top 25 journals listed in Journal Citation Reports (JCR)[6] in the subject area of Environmental Studies. Of these titles, 25 are available electronically to staff and students of the University. We prioritize acquisition of online journals where possible.

Monographs: The UTL maintains comprehensive book approval plans with 43 book vendors worldwide. These plans ensure that the Library receives academic monographs from publishers all over the world in an efficient manner. In support of programs within the Department of Physical and Environmental Sciences, monographs are purchased in electronic form where possible, and the Library currently receives all current e-books directly from publishers such as the following: Elsevier Science Direct, SAGE, Springer Books, Taylor & Francis, Wiley-Blackwell Online Books.

Knowledge Synthesis: Libraries are key partners in research through their collaborations with faculty in completing knowledge syntheses studies and providing consultations to faculty and students on comprehensive searching for method driven reviews.

Preservation, Digitization, and Open Access: The UTL supports open access to scholarly communication and research information through its institutional research repository (known as T-Space), its Downsview print repository, its open journal services, subscriptions to open access publications, and support for preservation of research materials in all formats. In addition to acquiring materials in support of climate change science, the Library has digitized its monograph holdings published before 1923. These books are available without charge to any Internet user.

Key Databases: UTL has subscriptions to key databases relevant to climate change studies. These include discipline-specific databases such as Sociological Abstracts, Worldwide Political Science Abstracts, Environmental Issues Online, GreenFile, PAIS Index, and GEOBASE. Broader indexes such as Scopus and Web of Science also support research in the program.

[6] 2021 Journal Citation Reports® (Thomson Reuters, 2021)

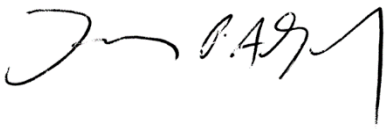
Special Collection Highlight: The UTSC Library does work in scholarly communications, preservation, and open access through the efforts of the Digital Scholarship Unit. The mission of the unit is to create, acquire, preserve and provide access to digital collections that will inspire and facilitate research and knowledge creation for the purposes of teaching and learning.

Current Gaps: As this is a newly-proposed undergraduate program, the DPES liaison will need to work with the department to gauge specific course/program needs. There is ample opportunity to provide collections support, as well as synchronous or asynchronous teaching and learning objects where relevant.

Other Library-Departmental Engagement: The liaison librarian is a regular attendee at orientation events, as well as for Departmental meetings and has dedicated agenda time to provide updates from the Library to faculty. The library and department have also collaborated around past climate-related initiatives, such as the 2021 Science Literacy Week event where faculty were invited to contribute to a climate-themed resource guide.

Prepared by: Sarah Guay, Liaison Librarian, UTSC Library, June 7, 2023

Submitted by: Larry Alford, Chief Librarian, University of Toronto Libraries, August 26, 2024



Appendix C: Student Support Services

Student Services Information for Quality Assurance Framework University of Toronto Scarborough

All University of Toronto undergraduate and graduate students have access to student services on all three campuses, Mississauga, St. George (downtown Toronto), and Scarborough, regardless of their 'home campus'. The services and co-curricular educational opportunities provide a complement to the formal curriculum by engaging and challenging students to reach their full potential as learners, leaders and citizens.

At the University of Toronto Scarborough (UTSC) these services are organized by the Office of Student Affairs and the Office of the Vice-Principal Academic and Dean, and support the success of our students from the time they are admitted through degree completion and beyond.

Academic Advising & Career Centre (AA&CC)
Integrates developmental advising, learning skills, and career development on further education and employment through individual appointments, workshops, experiential programming, events, peer support, and a range of online resources. The AA&CC is a team of professionals who advise, counsel and coach students with their learning and career development. They invite incoming students to attend the Get Started academic orientation program for support on academic and career planning in the summer, prior to starting first year. Students are eligible for services throughout their studies. Alumni are eligible for career development and employment coaching services for an additional 2 years following graduation.

Academic Travel Fund
Provides research and related scholarly funding for undergraduate students to underwrite the costs of valuable non-course based academic activities such as attending and presenting at conferences.

Access*Ability* Services
Provides services and academic accommodations to students with a learning, physical, sensory, or mental health disability or medical condition. Services include, but are not limited to, disability consulting and referrals for students, as well as workshops, online resources, assistive

technology support, and note taking and test/exam accommodations. Access*Ability* Services ensures that policies, practices, procedures, and programs at UTSC are inclusive, and provide equal access for students with disabilities. Access*Ability* Services also serves a growing campus as a key resource for consulting on accessible design, both physically and pedagogically.

Athletics & Recreation

Provides a respectful and inclusive environment for students to engage in physical activity, promotes overall well-being, and encourages a sense of community. Students have access to the Toronto Pan Am Sports Centre (TPASC), which features a range of accessible amenities including Olympic-sized pools, a climbing wall, multiple gyms and studios, a fitness centre, and an indoor track. The department also has multi-sport fields, an 8-court tennis facility and a varsity level baseball diamond housed in the valley. As a hub for healthy living on campus, Athletics & Recreation offers a variety of fitness and instructional programming, organized sports and leagues, as well as aquatics for all levels of physical activity. Highlights include drop-in sports, learn to play programs, women's programming, and the popular outdoor recreation program.

Department of Student Life

Offers a range of programming for first-year students, first generation students, mentorship and leadership development, community outreach, as well as Indigenous, intercultural and multi-faith programming using an anti-oppressive framework. The Department manages approximately 282 campus groups, including the facilitation of 17 departmental student associations, and liaises with all student societies to ensure compliance with University policy.

Responsibilities include: managing the committee process for allocating funds to student groups involved in various campus life programs and initiatives, ensuring adherence to the risk assessment process for all campus student events, supporting space allocation for clubs and events, representing the University as a partner in the annual Fall Orientation, and support of the Co-Curricular Record.

Health & Wellness Centre

Provides health promotion, mental health support, counselling and medical services to all UTSC students with a current student card and valid health card. Physicians and Registered Nurses provide first aid, treatment of minor illnesses, annual check-ups, immunizations, selected over-the-counter medications, referrals to specialists, and more. Wellness counsellors are equipped to support students with a number of issues including but not limited to: stress management, anxiety, depression, crisis counselling, family issues, mental health, relationships, sexuality,

bereavement, and eating disorders. In addition, group therapy and specialized workshops are offered throughout the year. The Health & Wellness Centre also has five Wellness Peer Programs that provide education and raise awareness about healthy lifestyle choices in areas including: nutritional health, sexual health, safe substance use, and mental wellness. These programs are supported by student-volunteers who build connections with their student-peers across campus.

International Student Centre
Provides support to international students studying at UTSC and to students interested in studying abroad to enhance their educational experience. Support for international students includes pre-arrival, transition, and immigration advising as well as mentorship, intercultural workshops, and University Health Insurance Plan (UHIP) support. The International Student Centre also provides guidance and resources for student mobility opportunities including: inbound and outbound exchanges, research and study abroad programs.

International Student Orientation and Transition (programming provided by the International Student Centre)
This is a two to three week set of activities from August to September. These activities include pre-arrival support, settling in city excursions, and socials. Also, online mentorship through our pre-arrival platform pairs international students with a peer educator to learn more about the campus and Canadian academic environment.

Student Housing & Residence Life
Responsible for the development of residence facilities and policies. The residence experience is a safe, fun, and inclusive community offering a range of social and extracurricular activities that support the academic achievements and personal development of students. Student Housing & Residence Life also provides off-campus housing services and resources for students living independently.

Workshops and advising is available to guide students through the process of searching for listings, tenant rights and responsibilities, lease agreements, and more.

Centre for Teaching and Learning

Undergraduate Student Support (that is <u>not</u> nested within specific courses)

1. **English Language Development Support** (ELDS): ELDS supports all students who experience difficulties using English in their coursework. Programming includes individual tutoring appointments, online resources and tools, language proficiency testing, and workshops. Students can enhance their skills in academic communication, cultural proficiency, reading, writing, listening and speaking comprehension, and vocabulary development.

2. **Mathematics and Statistics Learning Support** (MSLS): MSLS offers regular workshops to students on typical challenging math/stats topics. Also offered are drop-in group and individual tutoring for students with quantitative reasoning questions in courses requiring these skills. Students can also access virtual tutoring sessions and online modules and materials.

3. **Writing Support** (WS): In addition to offering in-class tailored workshops on particular aspects of writing, WS offers student appointments to discuss their assignment drafts with a writing expert. All students are eligible and can register for 50-minute appointments or use the 20-minute drop-in service. Students can also access online modules and resources.

Undergraduate Student Support (that <u>is</u> nested within specific courses)

- **English Language Development Support** (ELDS): To support academic challenges for English Language Learners, ELDS has integrated programming, including a Reading and Writing Excellence program, that helps students develop their skills as they complete course assignments.

- **Facilitated Study Group** (FSG) program: Working with course instructors, CTL trains successful students to serve as facilitators to organize study groups for historically difficult courses. The facilitators help participating students enhance their skills to identify major course concepts, and learn study strategies and fresh approaches for assignments and exams. Regular FSGs are offered as well as ones in partnership with English Language Development Support for students with English language challenges.

- **Mathematics and Statistics Learning Support** (MSLS): MSLS collaborates with introductory calculus courses to deliver a pre-course diagnostic test to identify students who lack certain critical numeracy skills. Students receive their diagnosis and are informed of specific seminars and workshops that can help them develop the skills they lack. MSLS also runs review sessions before major calculus and statistics exams. As well, MSLS faculty consult with non-mathematics course instructors around quantitative reasoning skills

required in their courses, and are willing to provide relevant course instruction either in class or as online modules.

- **Experiential Learning** (EL): CTL offers a for-credit experiential learning course where students can complete a community engagement learning opportunity. CTL also consults with faculty wanting to incorporate experiential learning components into their courses.

- **Writing Support** (WS): Faculty and TAs can meet with writing coordinators to advise on teaching writing assignments, and the design and implementation of writing and research paper assignments. After such consultations, the writing instructors are willing to deliver specific writing, editing or research skill instruction within the course, either in class, or by creating tailored class and online resources. WS also delivers a limited number of course-specific writing clinics to which students bring their drafts to receive tutor and peer feedback.

- **Video-capture of Lectures**: Upon faculty request, course lectures can be video-recorded and made available for review to students in those courses.

Supporting Faculty in Development of Teaching Expertise

- **Individual consultations and workshops** are available for a range of topics including course and syllabus design, developing and achieving learning outcomes, effective assessment, presentation skills, active learning techniques, inclusive teaching, classroom management, classroom visits and debrief, preventing plagiarism, as well as development of a reflective teaching practice and teaching portfolio construction. There are:
    - teaching orientation events that introduce instructors to key policies and best practices of teaching at UTSC;
    - workshops throughout the year on a range of teaching topics;
    - an annual teaching symposium;
    - individual consultations for syllabus, assignment or course design and other classroom issues; and
    - classroom visits for formative feedback.

- **Quercus and educational technology support including:**
    - Quercus, UTSC's learning management system;
    - instructional design for online assignments, courses and resources;

- classroom response devices (e.g., clickers);
- multiple choice test scanning and question quality assessment;
- mid-course assessments; and
- administrative support for course evaluations.

- **Teaching Grants** to enhance the content, delivery, assessment or infrastructure of courses; grant categories include equipment, software, enhancements/ innovations, assessment and professional development.

- **Assistance with Teaching Portfolios and Teaching Award nomination packages.**

Teaching Assistant Training and Graduate Student Professional Skills Development

- General first-time TA Training workshops for new Teaching Assistants
- Workshops on advanced topics for TAs based on TA interest (*examples: '*Effective and Efficient Grading', 'Responding to Students in Crisis').
- Graduate Student Professional Development Day.
- Graduate Student Professional Skills Programming.
- Graduate Thesis Writing Support Group.
- Writing Support and English Language Development, one-to-one appointments for writing/language skills.

Co-op Offices (Arts & Science and Management)

Serve more than 3400 students registered in over 40 Co-operative education programs spanning the arts, science, and business/management disciplines. The Arts & Science and Management Co-op Offices formally integrate a student's academic studies with work experience by facilitating four, eight, twelve, or sixteen month full-time, paid experiential learning opportunities. Students in Co-op receive developmental support in goal setting, job search, resume writing, on-line presence, and interviewing. For each four-month experience students are evaluated on the basis of mid-term and final performance reviews as well as a final project that is graded by a faculty member within the discipline.

Departmental Student Associations (DSAs)

DSAs establish a bridge between students and their academic departments. They are governed by annually elected student executive bodies and formed entirely of student members. These student groups liaise with faculty, the Department of Student Life and the Scarborough Campus

Students' Union to develop joint programming that enhances the discipline-specific learning and career development goals of students in each department.

Financial Aid and Awards
Provides resources and consultation services to assist students with financing their education, including processing of OSAP and other funding sources.

Lesbian, Gay, Bisexual, Transgendered and Questioning
Students are served by a campus-supported Positive Space Committee comprised of allies drawn from all segments of UTSC as well as a student LGBTQ club funded and facilitated independently through the Council on Student Services.

Orientation and Transition Programs
Provide new and first-year students with support and resources required for successful transition into university life. A list of programs includes:

- **Get Started** academic orientation, offered by the **Academic Advising & Career Centre**, runs throughout June and July, and currently hosts over 2,600 new incoming students along with their parents and guests. The interactive program provides an introduction to information and tools to allow for a successful start, including first-year course selection, student card registration, and exploring the campus.
- **Fall Orientation** is a multi-day series of events hosted by the Scarborough Campus Students' Union (SCSU) and the **Department of Student Life**, in collaboration with various other campus partners. Two key events include UTSC Welcome Day and the Faculty Mix & Mingles (Arts & Science, Computer Science and Management) led by the Department of Student Life. SCSU coordinates student participation in the tri-campus parade and other on-campus activities. These activities provide a welcoming and inclusive environment for new and first-year students.
    - Further emphasis on first year student support is continued in the First Year Experience Program and First-Generation Program led by the Department of Student Life.
- **International Student Orientation and Transition** programming provided by the **International Student Centre** is a two to three week set of activities from August to September. These activities include pre-arrival support, settling in city excursions, and socials. Also, a mentorship service known as the Buddy Program pairs international students with a peer educator to learn more about the campus and Canadian academic environment.

Registrar's Office

Provides a range of services to the academic departments, including student course and program registration; scheduling classes, term tests and final exams; recruiting candidates for admission; facilitating admission of incoming first year and upper-level students to limited enrolment programs, and removing those who fail to maintain program GPA requirements; maintaining student registration records; providing data support and summaries of enrolment; and resource-use for planning purposes.

Student Centre

Offers bookable activity spaces for students as well as a food court, a full-service restaurant and a variety store. It also houses the Office of Student Affairs, the Department of Student Life, the Health & Wellness Centre, The Underground, UTSC Women's & Trans Centre, Fusion Radio, and the Scarborough Campus Students' Union.

Appendix D: Comparator Programs

Please list U of T and external comparators; provide a short summary of the programs and highlight any differences between the degree programs and what is proposed. Examples provided in the table, below, should be removed.

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
U of T Comparators					
University of Toronto Faculty of Arts and Science	Environmental Studies Major https://artsci.calendar.utoronto.ca/program/asmaj1254	2024-25 program fees: $6,100.00 Ontario domestic 2024-25 program fees: $6,910.00 Full-Time Domestic (Non-Ontario Resident) Students	The Environmental Studies Major is an interdisciplinary program intended for students interested in studying and working in an environmental area, primarily within the social sciences or humanities. It offers rigorous academic study of the of the economic, social, cultural, and political forces that drive issues such as species extinction, loss of biodiversity, air and water pollution, and climate change.	Completion Requirements: (7.0 credits, including 2.5 credits at the 300+ level and a 0.5 credit at the 400-level) First Year: ENV100H1 is recommended but not required. Higher Years: 1. ENV221H1, ENV222H1, ENV223H1, ENV338H1.	The Major in Climate Change Studies is distinct since it requires more specialized expertise development specifically related to climate change through core courses and dedicated elective lists that are different from those in the Major in Environmental Studies.

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
			The interdisciplinary structure of the program provides grounding in scientific literacy while advancing critical thinking skills that will help students to evaluate complex environmental problems and sustainable solutions for improved environmental health and well-being. The major program provides a more in-depth exploration of this field of study.	2. ENV200H1 3. 0.5 credit from the following Environmental Policy, Law & Society courses: ENV320H1, ENV322H1, ENV323H1, ENV347H1, ENV350H1, ENV422H1, JGE331H1. 4. 0.5 credit from among the following Environmental Thought & Ethics courses: ENV333H1, JGE321H1, CLA373H1, PHL273H1, WGS273H1. 5. One of (ENV421H1/ ENV421Y1)/ ENV440H1/ ENV451H1/ ENV461H1/ ENV463H1/ ENV465Y1. 6. An additional 3.0 credits from any combination of courses	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				listed in the three groups below*, with no more than 1.0 credit from Group C: Environmental Science. Note: If either ENV421Y1 or ENV465Y1 is taken for requirement 5 above, students need only take an additional 2.5 credits for this requirement. *Students may choose to take these credits from courses across the three groups or within a particular group, depending on their interest. Group A: Environmental Policy, Law & Society Courses ANT346H1, ANT364H1, ANT371H1, ANT374H1, CSE342H1, ECO313H1, ECO314H1, ECO414H1,	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				ENV261H1/ ENV360H1, ENV281H1, ENV282H1, ENV307H1, ENV320H1, ENV322H1, ENV323H1, ENV335H1, ENV347H1, ENV350H1, ENV361H1, ENV362H1, ENV381H1, ENV382H1, ENV397Y0, ENV411H1, ENV422H1, ENV462H1, ENV464H1, FOR302H1, FOR303H1, FOR310H1, GGR223H1, GGR310H1, GGR329H1, GGR332H1, GGR334H1, GGR338H1, GGR341H1, GGR349H1, GGR416H1, GGR418H1, GGR434H1, GGR433H1, GGR438H1, HIS218H1, HIS300H1, HIS408H1, HPS307H1, HPS313H1, HPS316H1, HPS324H1, JGE321H1, JGE331H1, JGE481H1, JIG322H1, JIG440H1, POL205H1,	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				POL384H1, POL413H1, RSM466H1, TRN312H1 Note: GGR223H1 is NOT a substitute for ENV222H1. Group B: Environmental Thought & Ethics Courses INS250H1, INS402H1, ANT368H1, ANT376H1, CLA373H1, CRE271H1, EAS479H1, ENV330H1, ENV333H1, ENV430H1, FAH446H1, FOR302H1, FOR303H1, GGR419H1, HPS316H1, JGE321H1, JIG322H1, JUG320H1, PHL273H1, PHL373H1, PSY435H1, RLG318H1, RLG345H1, WGS273H1, WGS442H1	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Group C: Environmental Science Courses EEB240H1/ ENV234H1, ENV262H1, ENV337H1, ENV341H1, ENV342H1, ENV395Y0, ENV396H0, ENV396Y0, ENV431H1, ENV441H1, FOR200H1, FOR201H1, FOR400Y1, FOR401H1, GGR272H1, GGR273H1, GGR314H1, GGR337H1, ESS205H1, JEH455H1 Students in this program have the option to complete the Arts & Science Internship Program (ASIP) stream.	
University of Toronto Scarborough	Environmental Studies Major https://utsc.calendar.utoronto.ca/major-	2024-25 program fees: $6,100.00 Ontario domestic 2024-25 program fees:	There is significant public and student interest in environmental issues. The Major Program in Environmental Studies (B.A.)	Program Requirements: Completion of 8.5 credits as follows:	The Major in Climate Change Studies is distinct since it requires more specialized expertise development specifically related to climate change through core

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
Department of Physical and Environmental Sciences	program-environmental-studies-arts-scmaj2735	$6,910.00 Full-Time Domestic (Non-Ontario Resident) Students	gives students an opportunity to develop an understanding of environmental issues from the perspectives of the physical, life and social sciences. It serves as an excellent companion to majors such as Anthropology, Human Geography, Political Science, Public Policy, Sociology, Chemistry, Biochemistry, Environmental Science, Biology, Biodiversity, Ecology and Evolution, Physics and Astrophysics, and Physical Sciences. The program is designed as a contemporary rendering of the study of environmental problems and the knowledge/tools needed to solve them. One of its key	**1. Core Courses (2.5 credits)** EESA01H3 Introduction to Environmental Science [MGEA01H3 Introduction to Microeconomics or MGEA05H3 Introduction to Macroeconomics] ESTB01H3 Introduction to Environmental Studies *and* *0.5 credit chosen from the following:* ANTB01H3 Political Ecology ESTB02H3/GGRB18H3 Canada, Indigenous Peoples, and the Land GGRA03H3 Cities and Environments POLA01H3 Critical Issues in Politics I POLA02H3 Critical Issues in Politics II	courses and dedicated elective lists that are different from those in the Major in Environmental Studies.

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
			features is the classification of the courses offered into Foundation & Skills and Capstone & Applications. The former group will build a foundation of socioeconomics and environmental science, while the latter group will integrate insights from different disciplines and nurture an interdisciplinary way of thinking. These courses also include many opportunities for experiential learning through problem-solving case studies, team-based projects and individual research. Special emphasis is placed on the capacity of the program to successfully build the requisite interdisciplinary, problem-solving skill sets needed when tackling	POLB80H3 Introduction to International Relations I *and* *0.5 credit chosen from the following:* EESA06H3 Introduction to Planet Earth EESA07H3 Water EESA09H3 Wind EESA10H3 Human Health and the Environment EESA11H3 Environmental Pollution EESB18H3 Natural Hazards **2. Foundations and Skills (4.0 credits)** [ESTC35H3 Environmental Science and Technology in Society or ESTC36H3 Knowledge, Ethics and Environmental Decision-Making]	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
			environmental management issues. The program effectively balances the need for a strong foundation in basic principles characterizing a typical program in Environmental Studies and the importance of building bridges among the various disciplines involved.	ESTC34H3 Sustainability in Practice ESTC36H3 Knowledge, Ethics and Environmental Decision-Making IDSB02H3 Development and Environment STAB22H3 Statistics I (or equivalent) *and* *2.0 credits from the following:* EESB03H3 Principles of Climatology EESB04H3 Principles of Hydrology EESB05H3 Principles of Soil Science EESB17H3 Hydro Politics and Transboundary Water Resources Management EESC13H3 Environmental Impact Assessment and Auditing EESD13H3 Environmental Law, Policy and Ethics	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				ESTB04H3 Addressing the Climate Change ESTC40H3 Technical Methods for Climate Change Mitigation ESTD20H3 Integrated Natural Resource and Climate Change Governance GGRA30H3 Geographic Information Systems (GIS) and Empirical Reasoning GGRB21H3 Political Ecology: Nature, Society and Environmental Change (GGRC22H3) Political Ecology Theory and Applications GGRC26H3 Geographies of Environmental Governance GGRC28H3 Indigenous Peoples, Environment and Justice GGRC44H3 Environmental Conservation and Sustainable Development	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				POLC53H3 Canadian Environmental Policy POLD89H3 Global Environmental Politics SOCC37H3 Environment and Society **3. Capstone and Applications (2.0 credits)** [ESTD16H3 Project Management in Environmental Studies or ESTD19H3 Risk] ESTD17Y3 Cohort Capstone Course in Environmental Studies ESTD18H3 Environmental Studies Seminar Series	
Unversity of Toronto Mississauga Department of Geography,	Environmental Management Major https://utm.calendar.utoronto.ca/program/ermaj1425	2024-25 program fees: $6,100.00 Ontario domestic 2024-25 program fees: $6,910.00	The Environmental Management programs (Specialist, Major, Minor, Sustainability Minor, Environmental Law and Policy Minor and Combined MScSM) focus on environment, society,	Completion Requirements: 8.0 credits are required, of which at least 2.0 must be at the 300-400 level. **First Year: 2.0 credits:**	The Major in Climate Change Studies is distinct since it requires more specialized expertise development specifically related to climate change through core courses and dedicated elective lists that are different from those

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
Geomatics and Environment		Full-Time Domestic (Non-Ontario Resident) Students	and public policy. The cornerstone second-year course, ENV201H5 Environmental and Resource Management, provides students with an introduction to the political and socioeconomic framework of environmental management. Students then have the opportunity to develop specialized skills in resource management, environmental assessment and the social, economic and policy aspects of environmental change.	1. Environment Foundation: ENV100Y5 2. Foundation in Related Disciplines: 1.0 credit from: ANT102H5; ECO100Y5 or (ECO101H5 and ECO102H5); GGR111H5; POL111H5, POL114H5; SOC100H5 Be sure to look ahead and plan to complete the prerequisites for any upper-level courses that are of interest to you. **Second Year: 3.0 credits:** 1. Environmental Management Core: ENV201H5 2. Environmental Policy Core: JPE251H5 and JPE252H5 (formerly JPE250Y5)	in the Major in Environmental Management.

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				3. Social Science/Humanities Core: 0.5 credit from: ANT241H5; ENG259H5; ENV210H5; GGR202H5, GGR207H5, GGR208H5, GGR209H5, GGR210H5, GGR252H5, GGR265H5, GGR288H5; PHL274H5, PHL284H5 4. Science Core: 0.5 credit from: ANT214H5; BIO201H5, BIO205H5, BIO211H5; ERS201H5; GGR201H5, GGR214H5, GGR217H5, GGR227H5; 5. Quantitative, Digital, and Analytical Methods Core: 0.5 credit from: GGR276H5, GGR277H5, GGR278H5; STA220H5; or another program-relevant 200/300-level Research Methods	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				course, with permission of the Program Advisor **Upper Years: 3.0 credits:** 1. Environmental Management Perspectives: 1.0 credit from: ENV311H5, ENV320H5, ENV393H5, ENV425H5, ENV430H5, ENV435H5; JEP452H5 2. Social, Economic & Policy Perspectives: 1.0 credit from: ANT357H5, ANT368H5, ANT370H5, ANT463H5, ANT464H5; ECO373Y5; ENV305H5, ENV311H5, ENV320H5, ENV425H5, ENV430H5, ENV435H5; GGR318H5, GGR322H5, GGR325H5, GGR329H5, GGR333H5, GGR348H5, GGR349H5, GGR353H5,	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				GGR361H5, GGR362H5, GGR365H5, GGR370H5, GGR415H5, GGR418H5, GGR419H5, GGR420H5, GGR426H5, GGR461H5; JEP351H5, JEP356H5, JEP452H5; JGE378H5; POL343Y5, POL346Y5, POL475H5; SOC349H5, SOC356H5, SOC465H5; WRI375H5 3. Scientific Perspectives: 0.5 credit from: ANT327H5; BIO311H5, BIO331H5, BIO333H5, BIO464H5; ENV495H5, ENV496H5; ERS312H5, ERS313H5, ERS315H5, ERS321H5; GGR304H5, GGR305H5, GGR307H5, GGR309H5, GGR311H5, GGR315H5, GGR316H5, GGR317H5, GGR322H5, GGR337H5,	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				GGR338H5, GGR374H5, GGR375H5, GGR376H5, GGR377H5, GGR383H5, GGR384H5, GGR404H5, GGR406H5, GGR407H5, GGR440H5, GGR484H5; JGE378H5 4. Field, Project-based, Experiential, and Research Perspectives: 0.5 credit from : ENV299Y5, ENV332H5, ENV399Y5, ENV496H5, ENV497H5; GGR335H5, GGR379H5, GGR389H5; JEG401Y5, JEG417Y5; or another program-relevant Field, Experiential, or Research course, with permission of the Program Advisor Note: ENV490H5, ENV491H5 can substitute for #1, #2, #3, or #4 as	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				course requirements, where appropriate, and with permission of the Program Advisor or Academic Counsellor. Note: This is intended to be an interdisciplinary program. At least four different disciplines must be represented among the courses that are counted as program requirements. For example, a course list selected from ENV + GGR + ANT + POL is acceptable, but a course list selected only from ENV + GGR + ANT is not. Please contact the Program Advisors or Academic Counsellor if you have any questions about the validity of your course selections.	
Ontario Comparators					

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
Trent University Trent School of the Environment	Climate Change Science and Policy Major and Specialization	Domestic First-Year Tuition and Fees Estimated Average Budget for an Academic Year - Domestic Student Tuition: $6100 https://www.trentu.ca/futurestudents/undergraduate/tuition-awards/domestic-first-year-tuition-and-fees	Climate Change Science and Policy through the School of the Environment. The program is described as follows in the Trent course calendar: "The courses and learning outcomes align with the Intergovernmental Panel on Climate Change (IPCC) working groups, namely 'science,' 'impacts,' and 'mitigation.' The 'science' of climate change requires an understanding of physics, chemistry, and geography; the 'impacts' of climate change require an understanding of ecology, resource management, hydrology, planning, economics, and social justice; and the 'mitigation' of climate change requires an understanding of policy,	Bachelor of Science Program in Climate Change Science and Policy In addition to the program requirements listed below, students must satisfy the University degree requirements Fourteen science credits, including 1.0 Mathematics credit are required for the Honours degree A 4U Chemistry or equivalent is a prerequisite for CLIM 1050H The single-major Honours program. 20.0 credits including the following 13.5 credits: 3.0 CLIM credits consisting of CLIM 1050H, 2050H, 3005H, 4001H, 4002H and 4003H	This BSc program is similar to the proposed Major in its interdisciplinary breadth and development of climate change specific course such as Climate Data and Analytics and Carbon Accounting and Management. However, this is a BSc program with more requirements in physics, biology, chemistry, and math and less focus on environmental studies, social sciences, and policy and decision-making. Trent University also offers a 'Specialization' in 'Climate Change Science and Policy' that is not as comprehensive as the proposed Major. It requires students to take 8 courses as part of a degree in Geography, Environmental Science/Studies, or Environmental & Resource

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
			business, finance, law, and energy technologies." This specialization gives students in Geography and Environmental & Resource Science/Studies the opportunity to explore their major through the lens of climate change, considering the science, policy, and human implications. In this specialization, you will gain first-hand experience developing climate solutions through research and internship opportunities.	3.0 GEOG credits consisting of GEOG 1040H, 2180H, 2460H, 2530H, 3410H, and 3440H 2.0 ERST credits consisting of ERST 2100H, 3250H, 3502H, and 4140H 1.5 ERSC credits consisting of ERSC 1010H, and 2220H, and 2300H 1.0 ECON credits consisting of ECON 1010H, and ECON 3810H 1.0 MATH credits consisting of MATH 1005H and 1051H 0.5 BIOL credits consisting of BIOL 1020H 0.5 CHEM credits consisting of CHEM 2620H 0.5 PHYS credits consisting of PHYS 1000H 0.5 INDG credits from the approved list of ICR courses	Science/Studies. At Trent University, specializations allow students to develop areas of focus within their degree majors.

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Please consult the academic timetable for information on course offerings Year 1 (4.0 required plus 1.0 electives) CLIM-ERSC 1050H: Introduction to Climate Change Science & Policy (Sc) BIOL 1020H: Foundations of Biodiversity (Sc) ECON 1010H: Introductory Microeconomics (Sc) ERSC 1010H: Environmental Science and Sustainability (Sc) GEOG 1040H: Earths Physical Processes and Environments (Sc) MATH 1005H: Applied Calculus (Sc) MATH 1051H: Non-Calculus Statistics I: Elementary Probability and Statistics (Sc)	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				PHYS 1000H: Foundations of Physics (Sc) Recommended electives: IESS 1001H: Foundations in Indigenous Environmental Studies and Science (ICR), MATH 1110H: Calculus I: Limits, Derivatives, and Integrals (Sc), MATH 1120H: Calculus II: Integrals and Series (Sc), MATH 1550H: Probability 1: Introduction to Probability Year 2 (4.0 required plus 1.0 electives) CLIM-GEOG 2050H: Climate Data and Analytics (Sc) CHEM 2620H: Environmental Chemistry (Sc) ERST-POST 2100H: Environmental Science and Politics	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				ERSC 2220H: Environmental Assessment: Chemical and Laboratory Methods (Sc) ERSC 2300H: Energy Science and Technology (Sc) GEOG-ERSC 2180H: Apocalypse Now (Sc) GEOG 2460H: The Global Climate System (Sc) GEOG-ERSC 2530H: Water Resources (Sc) Recommended electives: BIOL-ERSC 2260H: Introductory Ecology (Sc), ERSC 2230H: Environmental Assessment: Sampling and Analysis (Sc), ERSC 2240H: Ecological Assessment for Natural Science Management (Sc), ERST-CAST 2525H: Critical Environmental Thinking: Political Economy and Policy Process, GEOG-BIOL-ERSC 2080H: Natural Science Statistics (Sc), GEOG-	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				ERSC 2090H: Introduction to Geographical Information Systems (Sc) Year 3 (3.0 required plus 2.0 electives) CLIM-ECON 3005H: Climate and Energy Economics (Sc) ECON-ERSC 3810H: Environmental Economics (Sc) ERST 3250H: Introduction to Environmental Law ERST 3502H: Climate and Environment Communications GEOG 3410H Climate Change: The Physical Basis (Sc) GEOG 3440H: Microclimatology (Sc) Recommended electives: ANTH-ERSC-GEOG 3185H: The Archaeology of Climate Change (Sc), ERST-POST-CAST 3120H:	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Canadian Environmental Policy, ERSC 3551H: Pollution Ecology (Sc), ERST-IDST-POST 3603H: Environmental Justice, ERSC-PSYC 3710H: Environmental Health (Sc), ERST-CAST 3780H: Canadian Renewable Resource Economics and Project Planning, ERSC/ERST-GEOG-SAFS-CLIM 3890H: Placement Course (Sc depending upon topic), PHYS-BIOL 3510H: Astrobiology: Life in the Universe (Sc), POST-ERST 3030H: Green Politics, POST 3605H: Policy Analysis: Methods and Application Year 4 (2.0 required plus 3.0 electives) CLIM 4001H: Applied Climate Modelling (Sc)	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				CLIM-ECON 4002H: Carbon Accounting and Finance (Sc) CLIM 4003H: Low Carbon Technology (Sc) ERST-GEOG 4140H: Climate and Energy Policy Recommended electives: ERSC/ERST 4010Y/4020D: Honours Thesis (Sc depending upon topic), ERST 4250H: Environmental Law and Regulation, ERST-IDST-POST-SAFS 4610H: Global Environmental Policy, ERSC/ERST 4830Y, 4840H: Community Based Research Project (Sc depending upon topic), IDST-ERST 4150Y: Post-Carbon Development and Radical Hope, POST 4081H: Canadian Politics and Public Policy	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				The Specialization in Climate Change Science and Policy offers a career-focused stream for students interested in both the scientific and policy aspects of climate change, and can be added to the Geography or Environmental and Resource Science/ Studies degrees by successfully completed the following 4.0 credits: – 2.0 ERSC/T credits consisting of: ERSC-GEOG 2180H ERSC 2300H ERST-GEOG 4140H ERSC 4350H – 0.5 GEOG credit consisting of GEOG 2460H	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				– 0.5 GEOG credit from GEOG 3410H or 3440H – 1.0 credit in addition to the above from: BIOL-ERSC 4330H ECON-ERSC 3810H ERSC-POST 2100H ERSC 3551H ERSC-PSYC 3710H ERST-IDST-POST-SAFS 4610H GEOG 3410H GEOG 3440H	
University of Waterloo Faculty of Environment in the Department of Geography and	BSc in Climate and Environmental Change https://uwaterloo.ca/future-students/programs/climate-	Domestic students Estimated tuition and incidental fees for two terms $9,000	In this program, students will study the science behind the challenges facing our planet's environment. Students will combine biology, chemistry, physics, and earth science with human geography to address challenges such as	Required Courses (17 units to complete) Complete all the following: EARTH121 - Introductory Earth Sciences (0.50) ENVS178 - Environmental Applications of Data	The program focuses on science behind the challenges facing our planet's environment and it combines biology, chemistry, physics, and earth science with human geography. The Department of Geography and Environmental Management also offers a Bachelor of

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
Environmental Management	environmental-change		flooding, permafrost thawing, drought and forest fires, peatland degradation, rising sea levels and coastal change, and changing economic opportunities in climate sensitive sectors. Students will master practical tools like computer modelling and hone the skills to build a low-carbon future. Students will enrich their classroom learning with hands-on experience in labs and fieldwork (and paid work experience through co-op).	Management and Statistics (0.50) ENVS200 - Field Ecology (0.50) ENVS278 - Applied Statistics for Environmental Research (0.50) GEOG101 - Human Geographies: People, Space and Change (0.50) GEOG102 - Global Environmental Systems: Processes and Change (0.50) GEOG181 - Designing Effective Maps (0.50) GEOG203 - Environment and Development in a Global Perspective (0.50) GEOG205 - Principles of Geomorphology (0.50) GEOG207 - Climate Change Fundamentals (0.50) GEOG209 - Hydroclimatology (0.50) GEOG271 - Earth from Space Using Remote Sensing (0.50)	Environmental Studies in Geography and Environmental Management, within which students can choose a 'specialization' in climate and environmental change. Specializations at Waterloo are 4-7 courses allowing students to focus on a specific topic within their major. Unlike the proposed Major, neither program integrates a set of core courses focused on environmental studies theory and skills for policy development and decision making. They are focused on natural sciences.

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				GEOG294 - Approaches to Research in Physical Geography (0.50) GEOG303 - Physical Hydrology (0.50) GEOG305 - Fluvial Geomorphology (0.50) GEOG307 - Societal Adaptation to Climate Change (0.50) GEOG309 - Physical Climatology (0.50) GEOG310 - Geodesy and Surveying (0.50) GEOG320 - The Cryosphere (0.50) GEOG391 - Field Research (0.50) GEOG417 - Climate Change Communication (0.50) Complete 1 of the following: BIOL150 - Organismal and Evolutionary Ecology (0.50)	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				BIOL251 - Fundamentals of Ecology (0.50) Complete 1 of the following: CHEM120 - General Chemistry 1 (0.50) PHYS111 - Physics 1 (0.50) Complete 1 of the following: EMLS129R - Written Academic English (0.50) ENGL109 - Introduction to Academic Writing (0.50) ENGL129R - Written Academic English (0.50) Complete 1 of the following: GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50) PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Complete 1 of the following: ERS484 - Soil Ecosystem Dynamics (0.50) GEOG403 - Eutrophication: From Process to Water-Quality Management (0.50) GEOG404 - Soil Ecosystem Dynamics (0.50) Complete 1 of the following: GEOG405 - Wetlands (1.00) GEOG459 - Energy and Sustainability (1.00) Complete 1 of the following: MATH104 - Introductory Calculus for Arts and Social Science (0.50) MATH127 - Calculus 1 for the Sciences (0.50) Complete 1 of the following:	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				GEOG407 - Environmental Hydrology of Terrestrial Ecosystems (0.50) GEOG420 - Ice Sheets and Glaciers (0.50) Complete 2 of the following: GEOG408 - Earth's Future Climates (1.00) GEOG409 - Energy Balance Climatology (1.00) GEOG452 - Climate Change and Environment Project (1.00) GEOG490B - Honours Thesis Completion (1.00) https://uwaterloo.ca/academic-calendar/undergraduate-studies/catalog#/programs/B1zHkkCAo2?group=Climate%20and%20Environmental%20Change&bc=true&bcCurrent=Climate%20and%20Environmental%20Change	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				&bcItemType=programs&bc=true&bcCurrent=Climate%20and%20Environmental%20Change%20(Bachelor%20of%20Sciences%20-%20Honours)&bcGroup=Climate%20and%20Environmental%20Change&bcItemType=programs	
Carleton University Faculty of Arts and Social Sciences Department of Geography and Environmental Studies	Environmental Studies B.A. Honours https://calendar.carleton.ca/undergrad/undergradprograms/environmentalstudies/	Domestic tuition fees $7,419 – $11,964 Canadian residents outside of Ontario $8,428 – $13,749	How do people interact with nature, and how does this impact the environment? How do societies transform nature? The environment consists of a complex set of human and natural systems of which people are an important, and sometimes dominant, element. Decisions made by individuals, institutions, governments, industries and other actors have the ability to impact the environment in both direct and indirect ways, with	**A. Credits Included in the Major CGPA (11.0 credits)** **1. 1.0 credit in:** ENST 1000 [0.5] Introduction to Environmental and Climate Change Studies or ENST 1020 [0.5] People, Places and Environments GEOG 1010 [0.5] Global Environmental Systems **2. 1.0 credit in:** ENST 2000 [0.5] Environmental Justice	The Major in Climate Change Studies is distinct from this major in environmental studies since our proposed program requires more specialized expertise development specifically related to climate change through core courses and dedicated elective lists

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
			consequences for future generations. Understanding the costs and benefits of development and conservation, as well as the underlying values and ethical guidelines for good environmental practice are critical for informed environmental decision-making. It is critical, to both the present and future state of the environment, that dialogue and policy are precautionary, evidence-based, thoughtful and inclusive. The Environmental and Climate Change Studies program at Carleton University prepares students to be informed, skilled individuals who can participate effectively	ENST 2001 [0.5] Sustainable Futures: Environmental Challenges and Solutions **3. 0.5 credit from:** GEOG 2013 [0.5] Weather and Water GEOG 2014 [0.5] The Earth's Surface GEOG 2020 [0.5] Ecosystems of Canada **4. 1.0 credit in:** ENST 2005 [0.5] Introduction to Qualitative Research ENST 2006 [0.5] Introduction to Quantitative Research **5. 1.0 credit in:** ENST 3000 [0.5]	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
			in the resolution of environmental problems and in the larger environmental debates critical to our future.	Nature, Environment and Society ENST 3022 [0.5] Environmental and Natural Resources **6. 0.5 credit from:** INDG 2015 [0.5] Indigenous Relationalities, Kinships, and Knowledges PHIL 2380 [0.5] Introduction to Environmental Ethics **7. 1.0 credit from:** ECON 3804 [0.5] Environmental Economics GEOG 3206 [0.5] Health, Environment, and Society GEOG 3209 [0.5] Sustainability and Environment in the South GEOG 3501 [0.5]	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Geographies of the Canadian North HRSJ 3503 [0.5] Global Environmental Justice LAWS 3800 [0.5] Law of Environmental Quality PHIL 3380 [0.5] Environments, Technology and Values PSCI 3801 [0.5] Environmental Politics TSES 3002 [0.5] Energy and Sustainability **8. 0.5 credit from:** ENST 3900 [0.5] Honours Field Course GEOG 3030 [0.5] Regional Field Excursion **9. 0.5 credit in:** ENST 4000 [0.5]	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Environmental and Climate Change Studies Seminar **10. 0.5 credit from:** ENST 4006 [0.5] Environmental Policy Analysis GEOG 4022 [0.5] Seminar in People, Resources and Environmental Change GEOG 4023 [0.5] Seminar in Special Topics on the City GEOG 4004 [0.5] Environmental Impact Assessment ENST 4050 [0.5] Environmental and Geographic Education **11. 1.0 credit in:** **a) Thesis pathway** 1.0 credit from: ENST 4906 [1.0]	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Honours Research Project ENST 4907 [1.0] Honours Research Essay or **b) Course pathway** 1.0 credit in Approved Environmental Studies Electives at the 4000 level **12. 0.5 credit in:** **a) Co-op students must complete:** Approved Environmental Studies electives at 4000 level, excluding ENST 4001 and ENST 4002 **b) All other students must complete one of:** ENST 4001 [0.5] Environmental Studies Practicum I ENST 4002 [0.5]	

Institution and Unit	Degree and Program (including URL)	Domestic Tuition	Program Description	Curriculum	Differences Between This Program and What is Proposed
				Environmental Studies Practicum II **13. 1.0 credit in** Approved Environmental Studies Electives at the 3000 level or above **14. 1.0 credit in** Approved Environmental Studies Electives **B. Credits Not Included in the Major CGPA (9.0 credits)** **15. 9.0 credits in** free electives Total Credits: 20.0	

Appendix E: Comparison of Environmental Studies Major and Climate Change Studies Major Program Requirements

Environmental Studies Major	Climate Change Studies Major
1. Core Courses (2.5 credits) EESA01H3 Introduction to Environmental Science [MGEA01H3 Introduction to Microeconomics *or* MGEA05H3 Introduction to Macroeconomics] ESTB01H3 Introduction to Environmental Studies *and* *0.5 credit chosen from the following:* ANTB01H3 Political Ecology ESTB02H3/GGRB18H3 Canada, Indigenous Peoples, and the Land GGRA03H3 Cities and Environments POLA01H3 Critical Issues in Politics I POLA02H3 Critical Issues in Politics II POLB80H3 Introduction to International Relations I *and* *0.5 credit chosen from the following:* EESA06H3 Introduction to Planet Earth EESA07H3 Water EESA09H3 Wind	**1. Foundations (2.5 credits)** EESA01H3 Introduction to Environmental Science EESA06H3 Introduction to Planet Earth ESTB01H3 Introduction to Environmental Studies *and 0.5 credit from:* - ANTB01H3 Political Ecology* - GGRA03H3 Cities and Environments - POLA01H3 Critical Issues in Politics I - POLA02H3 Critical Issues in Politics II - POLB80H3 Introduction to International Relations I - POLB90H3 Comparative Development in International Perspective - POLB91H3 Introduction to Comparative Politics *and 0.5 credit from:* - ANTA02H3 Introduction to Anthropology: Society, Culture and Language - FSTA01H3 Foods That Changed the World - FSTA02H3 Food Futures: Confronting Crises, Improving Lives - IDSA01H3 Introduction to International Development Studies

Environmental Studies Major	Climate Change Studies Major
EESA10H3 Human Health and the Environment EESA11H3 Environmental Pollution EESB18H3 Natural Hazards	- MGEA01H3 Introduction to Microeconomics - MGEA05H3 Introduction to Macroeconomics - WSTA01H3 Introduction to Women's and Gender Studies
2. Foundations and Skills (4.0 credits) [ESTC35H3 Environmental Science and Technology in Society *or* ESTC36H3 Knowledge, Ethics and Environmental Decision-Making] ESTC34H3 Sustainability in Practice ESTC36H3 Knowledge, Ethics and Environmental Decision-Making IDSB02H3 Development and Environment STAB22H3 Statistics I (or equivalent) *and* *2.0 credits from the following:* EESB03H3 Principles of Climatology EESB04H3 Principles of Hydrology EESB05H3 Principles of Soil Science EESB17H3 Hydro Politics and Transboundary Water Resources Management EESC13H3 Environmental Impact Assessment and Auditing EESD13H3 Environmental Law, Policy and Ethics ESTB04H3 Addressing the Climate Change ESTC40H3 Technical Methods for Climate Change Mitigation ESTD20H3 Integrated Natural Resource and Climate Change	**2. Core Courses (1.5 credits)** ESTB04H3 Addressing the Climate Crisis ESTB05H3 Climate Science for Everyone *and 0.5 credit from:* - EESB03H3 Principles of Climatology* - EESB04H3 Principles of Hydrology - EESB18H3 Natural Hazards - ESTB02H3/ GGRB18H3 Whose Land? Indigenous-Canada-Land Relations - ESTB03H3 Back to the Land: Restoring Embodied and Affective Ways of Knowing - GGRB21H3 Political Ecology: Nature, Society and Environmental Change - IDSB02H3 Development and Environment - STAB22H3 Statistics I (or equivalent)

Environmental Studies Major	Climate Change Studies Major
Governance GGRA30H3 Geographic Information Systems (GIS) and Empirical Reasoning GGRB21H3 Political Ecology: Nature, Society and Environmental Change (GGRC22H3) Political Ecology Theory and Applications GGRC26H3 Geographies of Environmental Governance GGRC28H3 Indigenous Peoples, Environment and Justice GGRC44H3 Environmental Conservation and Sustainable Development POLC53H3 Canadian Environmental Policy POLD89H3 Global Environmental Politics SOCC37H3 Environment and Society	
3. Capstone and Applications (2.0 credits) [ESTD16H3 Project Management in Environmental Studies *or* ESTD19H3 Risk] ESTD17Y3 Cohort Capstone Course in Environmental Studies ESTD18H3 Environmental Studies Seminar Series	**3. Applications and Skills (4.5 credits):** ESTC35H3 Environmental Science and Technology in Society ESTC36H3 Knowledge, Ethics and Environmental Decision-Making ESTC37H3 Energy and Sustainability EESD17Y3/ ESTD17Y3 Cohort Capstone Course in Environmental Studies ESTD19H3 Risk *and 1.0 credit from:* - ESTC40H3 Technical Methods for Climate Change Mitigation - EESD16H3/ ESTD16H3 Project Management in Environmental Studies

Environmental Studies Major	Climate Change Studies Major
	- ESTD20H3 Integrated Natural Resource and Climate Change Governance - EESC34H3/ ESTC34H3 Sustainability in Practice *and 0.5 credit from:* - ANTB36H3 Anthropology of the End of the World - EESC38H3/ ESTC38H3 The Anthropocene* - GGRC24H3 Socio-Natures and the Cultural Politics of 'The Environment' - GGRC26H3 Geographies of Environmental Governance - GGRC28H3 Indigenous Peoples, Environment and Justice - GGRC44H3 Environmental Conservation and Sustainable Development - POLC53H3 Canadian Environmental Policy - SOCC37H3 Environment and Society* - EESD06H3 Climate Change Impact Assessment* - EESD13H3 Environmental Law, Policy and Ethics - POLD89H3 Global Environmental Politics - PSCD11H3 Communicating Science: Film, Media, Journalism, and Society - EESD09H3/EESD10Y3 Research Project in Environmental Science - ENGC59H3 Literature and the Environment