FOR INFORMATION **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:	September 4, 2025 for September 11, 2025
AGENDA ITEM:	6

ITEM IDENTIFICATION:

Review of Academic Programs and Units, UTSC: Department of Physical and Environmental Sciences and its Undergraduate Programs

JURISDICTIONAL INFORMATION:

Under section 5.7 of the Terms of Reference of the University of Toronto Scarborough Academic Affairs Committee (UTSC AAC) provides that the Committee "shall receive for information and discussion reviews of academic programs and/or units consistent with the protocol outlined in the *University of Toronto Quality Assurance Process*. The reviews are forwarded to the Committee on Academic Policy and Programs for consideration."

GOVERNANCE PATH:

1. **UTSC Academic Affairs Committee [For Information] (September 11, 2025)**

PREVIOUS ACTION TAKEN:

- Committee on Academic Policy and Programs (AP&P), April 10, 2025 [For Information]. The Committee was satisfied with the Dean's Administrative Response. No follow-up report was requested.
- Academic Board, May 29, 2025 [For Information]. The Board was satisfied with the Report from AP&P.

HIGHLIGHTS:

The *Cyclical Program Review Protocol* "is used to ensure University of Toronto programs meet the highest standards of academic excellence" (UTQAP, Section 6.1). The *Protocol* applies to all undergraduate and graduate degree programs offered by the University, and the University's full complement of undergraduate and graduate degree and diploma programs are reviewed on a planned cycle. Reviews are conducted on a regular basis, and the interval between program reviews must not exceed eight (8) years.

- The external review of academic programs requires:
- The establishment of a terms of reference;
- The selection of a review team;
- The preparation of a self study;
- A site visit;
- Receipt of a report from the external review team;
- The Vice-Provost, Academic Programs' formal request for an Administrative Response;
- The formal Administrative Response, combining responses from the Dean and Vice-Principal Academic, as well as from the Chairs/Directors of the relevant programs and/or units; and
- The Final Assessment Report and Implementation Plan.

In accordance with the *Protocol*, an external review of the Department of Physical and Environmental Sciences and its undergraduate and graduate programs was commissioned for the 2023-24 academic year. During the site visit held from March 27-28, 2024, the review team met with a broad range of stakeholders, including UTSC senior academic administrators, the Department Chair, and faculty, staff, and students in the Department.

The reviewers commended the Department's undergraduate curricula for aligning with current disciplinary trends and offering extensive experiential learning opportunities. They also praised the Department for fostering a vibrant research culture that prepares graduate students, particularly PhDs, for success in academia and beyond. The reviewers were also impressed by the faculty's research quality and leadership in technological and pedagogical innovations.

In their report, the review team recommended:

- Consulting with stakeholders to determine future directions for the undergraduate co-op program, to ensure it aligns with the Department's academic goals
- Enhancing support structures for graduate students
- Prioritizing coverage in Physics and diversifying faculty hiring when opportunities arise
- Engaging in strategic planning to address leadership transitions and departmental growth
- Upgrading laboratory spaces to meet technical support demands and student accessibility needs, and to accommodate incoming cohorts of SAMIH/health sciences students

In response to these recommendations, the Department has:

- Reassessed responsibilities of teaching assistants to optimize use of existing resources and increased TA hours for courses requiring extra support

- Reaffirmed its commitment to EDI principles in program and course delivery, including efforts to create safe and inclusive learning environments, integrate Indigenous knowledge and pedagogy, and reducing students' barriers to experiential learning and field trips

The Department will also:

- Collaborate with cognate units, especially those based at the St. George campus, to strengthen graduate student community and cross-campus engagement
- Await re-accreditation results from the Chemical Society of Canada for its Chemistry programs, including the recently modified Specialist and Specialist (Co-op) programs in Medicinal and Biological Chemistry
- Identify additional personnel needs, in consultation with the Dean's Office, for inclusion in the next faculty complement plan
- Partner more systematically with the UTSC Development and Alumni Relations Office on alumni outreach and fundraising initiatives

Additionally, the Dean and the Dean's Office will:

- Engage in strategic discussions with academic leaders and the Arts & Science Co-op office to support the long-term success of co-op and experiential learning, drawing also on feedback from an upcoming external review process
- Advocate for spacing (re-)allocation needs on behalf of the Department in alignment with campus construction projects and strategic hiring priorities
- Connect the Department with the Marketing and Communications team, the Equity, Diversity, and Inclusion Office, and the Office of Indigenous Initiatives to enhance visibility of the Department's EDI and reconciliation efforts
- Represent the Department's interests in discussions about lab accessibility and safety with campus leadership

The Dean's Office will monitor the implementation of these recommendations through ongoing meetings with the Chair of the Department of Physical and Environmental Sciences. A brief progress report will be submitted to the Office of the Vice-Provost, Academic Programs midway between the March 2024 site visit and the next scheduled review. The next external review of the Department is set for no later than the 2031-32 academic year.

FINANCIAL IMPLICATIONS:

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

RECOMMENDATION:

This item is presented for information only.

DOCUMENTATION PROVIDED:

1. Review Report (June 13, 2024)
2. Provostial Request for Administrative Response (December 9, 2024)
3. Administrative Response (March 20, 2025)
4. Provostial Final Assessment Report and Implemental Plan (July 24, 2025)

UTQAP Cyclical Review Report

Framework for UTQAP reviews:
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.

Reviews provide the opportunity to celebrate successes, identify areas where we can do better and vigorously pursue improvements.

Review Report:

Independent expert review is foundational to the Cyclical Program Review process. The Review Report addresses the Terms of Reference to provide insights and recommendations that inform the continuous improvement of the academic program(s) and academic unit(s) under review. Reflecting this commitment to continuous improvement, the final review report is considered a public document and 1) will be circulated within the unit; 2) may be posted on the unit's website; and 3) will be shared with external reviewers at the time of the next review.

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** (self-study, site visit, review report) **must immediately be brought to the attention of the commissioning officer and routed through appropriate University channels for resolution**.

As Commissioning Officer, I confirm that:

- ✓ The Report addresses the Terms of Reference, which reflect the requirements outlined in the UTQAP, including the program evaluation criteria.
- ✓ 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.

Commissioning Officer*: Professor William A. Gough, Vice-Principal Academic & Dean	Report Accepted as Final on June 13, 2024

Reviewers are asked to provide a Report that:

- Responds to the Terms of Reference, which reflect the requirements outlined in the UTQAP, including the program evaluation criteria.
- Recognizes the institution's autonomy to determine priorities for funding, space and faculty allocation. Any commentary or recommendations on issues that are within the purview of the university's internal budgetary decision-making processes (e.g., such as faculty complement and/or space requirements) must be tied directly to issues of program quality or sustainability.
- Respects the confidentiality required for all aspects of the review process.

Program(s) under review:	• Applied Climatology: Min (Science) • Astronomy and Astrophysics: Min (Science) • Biochemistry, B.Sc.: Maj and Co-op

	• Biological Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op • Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op • Environmental Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op • Environmental Geoscience, B.Sc.: Spec and Co-op • Environmental Physics, B.Sc.: Spec and Co-op • Environmental Science, BSc: Maj and Co-op; Min • Environmental Studies, BA: Maj • Global Environmental Change (formerly Environmental Biology), B.Sc.: Spec and Co-op • Natural Sciences and Environmental Management: Min (Science) • Physics and Astrophysics, BSc: Spec; Maj • Physical and Mathematical Sciences, B.Sc.: Spec • Physical Sciences, B.Sc.: Maj • Certificate in Sustainability (Category 2) • Combined Degree Programs with FASE MEng • Combined Degree Programs with MEnvSc • Combined Degree Programs with OISE MT • Master of Environmental Science (M.Env.Sc.) • Environmental Science, Ph.D. • Environmental Science, M.Sc. (approved to begin in May 2023)
Division/unit under review:	Department of Physical and Environmental Sciences (DPES)
Commissioning officer:	Professor William A. Gough, Vice-Principal Academic & Dean
Date of scheduled review:	Wednesday, March 27, 2024 and Thursday, March 28, 2024
Reviewers' names and affiliations:	• Dr. Simon Bates, Vice-Provost and Associate Vice-President, Teaching & Learning, and Professor of Teaching, Department of Physics & Astronomy, University of British Columbia • Dr. Jeffrey McKenzie, Professor, Department of Earth & Planetary Sciences, McGill University • Dr. Jonathan Overpeck, Samuel A. Graham Dean, School for Environment and Sustainability, University of Michigan

A. Summary & Overall Assessment

Please provide a summary of your findings, focusing on the assessment of the division/unit and the program(s) under review relative to the best in Canada/North America and internationally, including areas of strength and opportunities.

Our review preparation and site visit confirmed that the Department of Physical and Environmental Sciences (DPES) is functioning highly effectively, and in full support of University of Toronto Scarborough and University of Toronto academic plans. DPES has benefited from a stable period of strong Departmental leadership. This was widely appreciated amongst colleagues, which in turn supports a generally highly cohesive and functional grouping of different disciplines, taught programs, and research activities within a broad 'omnibus' department. Departmental research is exceptionally strong, and taught program numbers are generally strong and getting stronger in most areas, with identified areas of growth and expansion. We noted that significant progress has been made with respect to recommendations from the previous external review. Overall, Departmental morale appeared high, and prospects for the future bright, particularly if university increases funding to match the on-going growth in departmental stature, student numbers and overall impact.

B. Findings

Based on your reading of the self-study and discussions during the site visit, please address all the Terms of Reference (appended) as follows:

- **Confirm that you have considered each of the Terms of Reference in relation to each academic program and/or academic unit listed in the Terms of Reference.**
- Comment on the program(s)/unit(s) respective **strengths, areas for improvement** and **opportunities for enhancement**. In so doing, please:
    - Identify the **distinctive attributes** of each program listed in the Terms of Reference
    - Identify and commend any **notably strong and creative attributes**
    - Provide evidence of any **significant innovation or creativity** in content and/or delivery relative to other such programs
- Ensure that the findings address, for each program listed in the Terms of Reference, the quality of each academic program and the learning environment of the students in each program.

- *Note: Unless a specific program or group of programs is specified, the assumption will be that findings apply to all programs listed in the Terms of Reference.*

1 PROGRAMS

1.1. Objectives and key features

The University of Toronto's Mission is to be "an internationally significant research university, with undergraduate, graduate and professional programs of excellent quality." Based on our interviews with faculty, staff, and students, the Department of Physical and Environmental Sciences (DPES) is focused on this broad aspiration with its 23 undergraduate and graduate programs covering physics, chemistry, environmental science and environmental studies at the undergraduate, graduate and professional program levels.

The previous external review was conducted in October 2017. In response to the review, the Department has undergone a major transformation. In particular there has been a net increase of 18 faculty and staff and there have been 150 submissions of course/program proposals and revisions. Further, as was clearly evident in our visit, the department took the recommendation to increase experiential learning seriously and there is a wealth of such opportunities now available for students.

During our site visit, we heard about many exciting advances in promoting EDI initiatives throughout the department. A critical mass of Teaching Stream faculty are leading technological and pedagogical innovations, as well as a number EDI-centred curriculum innovations. Though not mentioned explicitly, many of the program and course designs we learned about support the principles of Universal Design for Learning (UDL), which can enhance the experience of all learners.

The undergraduate program has a very strong local community connection, with 50% of the Department's student population coming from the immediate surrounding area (Scarborough, Markham, Durham), and another 30% of the students being international. In this context, an important EDI aspect for the department is the recruitment of students from diverse backgrounds. We were very impressed with the work of the Registrar's office in liaising with both internal campus partners to promote the Department's programs to Black and Indigenous students, and the numerous community partnerships (e.g., with high schools) that further drive student diversity. We also heard about numerous faculty-driven initiatives around EDI, including a DPES teaching grant that was recently submitted for EDI training for graduate students and teaching assistants. Further, DPES faculty are utilizing the Pedagogies of

Inclusive Excellence Fund that is available for DPES faculty to incorporate inclusive pedagogies, including Indigenous content into curriculum.

For the Professional MSc program (described below), there are numerous activities to support students from diverse backgrounds. Of note, even before students matriculate in the Fall there is an online professional skills primer course assisting incoming students (e.g., with resume writing).

As a committee, we found the breadth and impact of the Co-op programs for both undergraduate students and with the Professional Masters program to be an impressive and high impact practice. The amount of work and effort required to implement such programs is intense. In particular we note the 100% success rate in finding co-op/internship placements for the Professional Masters students is impressive and a signature aspect of the program.

Further, we highlight that DPES maintains their accreditation for some Chemistry programs by the Canadian Society for Chemistry and the Major programs in Environmental Science and Environmental Studies by the Environmental Careers Organization (ECO) of Canada.

We note additional positive aspects of the DPES program, including:

- DPES contributes effectively to the goals and mission of the UTSC campus and UoT more broadly.
- The DPES programs are distinct in their applied and interdisciplinary learning, with many programs augmented with strong experiential components, e.g., Co-op placements and internship opportunities.
- There is a critical mass of Teaching Stream faculty leading technological and pedagogical innovations, as well as a number of EDI centred curriculum innovations. Very positive to see Teaching Stream faculty also actively involved in research.
- Many program areas are in growth mode, apart from Chemistry. However, the new *Scarborough Academy of Medicine and Integrated Health (SAMIH)* initiative appears to offer additional growth potential, including for Chemistry, through teaching opportunities.

1.2. Program requirements

The program requirements, including program-level learning outcomes, are appropriate for the DPES programs. The Self Study document and Appendices provide extensive detail documenting how learning expectations and program outcomes are linked. For example, the learning outcomes for the Specialist in Physics Astrophysics program (Self Study Table 2.4.2.2)

demonstrates a clear and deliberate program structure wherein students develop a knowledge foundation in Year 1 and 2 courses, and progress to learning expectations and outcomes, such as communication skills, understanding knowledge limits, and professional development in the Year 3 and 4 courses.

The modes of delivery are appropriate for the Programs. The faculty use a reasonable mixture of in-person and online teaching, including courses with online modules to supplement in-person courses. We note that the Programs provide numerous experiential learning opportunities for students, including teaching laboratories, field-based projects, and field trips.

In reviewing the documents and talking to DPES faculty we do not identify any obvious gaps or missing content from the program outcomes. The curricula are current and relevant, reflecting the trends within the various disciplines across the DPES programs.

1.3. Program requirements for grad programs

The Department has two programs for graduate student training: a standard research-based PhD program and a MSc Professional Master of Environmental Science. (We are not reviewing the research-based MSc program as it was approved recently and not yet operational). From our observations, the department has a thriving research environment for graduate students. The DPES graduate students comprise half of the graduate students affiliated with the UTSC campus.

The PhD program has existed since 2010 and has had consistent application numbers (~40 students applying per year) and approximately 15 new PhD students enrolling each year. Academically the students are very successful, with numerous competitive scholarships from NSERC/CIHR/OGS/etc. In addition to standard course requirements, including an Environmental Science Seminar course, the department has an excellent focus on preparing PhD students for entering the workforce after degree completion. In particular, the Department has implemented an innovative new staff position: Student Learning and Professional Development (SLPD) Coordinator to implement plans that support the development of work-integrated learning opportunities for PhD students. This program is innovative and one of the few programs in the physical sciences that we know of that is addressing the emerging trend of PhD students whose post-degree goals are not to enter academia.

The Environmental Science Professional MSc program is arguably a leader in Canada for one-year coursework and Co-op-based environment programs. The program averages an impressive 85 students per year, and students can follow Co-op and non-Co-op versions, with

different sub-topic focuses. From our understanding, most students utilise the Co-op option. The program has a standard set of courses, including the Advanced Seminar in Environmental Science that prepares students for the workplace by developing professional skills. Of note is that this particular Co-op program is managed directly by DPES, and not by the campus-level Co-op office. Further, the success of the Co-op component of the program is a direct result of the work of small number of dedicated staff members who support applicants and develop the pool of potential placements. The program has excellent outcomes for students: 70% of internships are extended beyond the initial 4-month period, and now some of the 1000+ alumni of the program are themselves instigating Co-op placements as part of their jobs. In reading the Self Study report, and in talking with students and faculty, it is clear that this program is particularly effective, both in teaching and in creating a strong learning community.

Research strength is a key feature in supporting a thriving grad education system in the DPES (i.e., the Professional Masters, Research Masters, and PhD programs). Collectively the DPES programs constitute about half of graduate education footprint at UTSC. This is impressive.

Course sequence pathways for students who do co-op options that do not impede time to completion have been developed, but we heard that more work is in progress to improve these pathways.

1.4. Assessment of teaching and learning

Based on the Self Study, we find the methods of assessment to be varied and balanced. Generally, for most courses less than half of the course grade is determined by a final exam, and assessments provide different avenues for students to demonstrate knowledge.

The program curricula provide a good range of continuously assessed components. It is clear that a cross-cutting focus on writing has been implemented (in response to the 2017 review). For example, the Chemistry program faculty received a University of Toronto ‘LEAF’ grant to develop online writing modules to enhance classes.

There are quality enhancement processes in place. At the end of each course, student surveys provide feedback to instructors regarding teaching practices, resources, and overall learning experience. From the data presented in the Self Study document, there appears to be no significant trends in the survey results (negative or positive) nor any issues of concern at a broader scale.

1.5. Admission requirements

In speaking with the staff from the registrar's office, DPES faculty/staff, and reading the self-study report, we found the admission requirements to be entirely appropriate for the programs offered. From our understanding, the granular admissions requirements (e.g., minimum high school GPA) are set at the department level. There are continual challenges with changes in high school curriculum (such as a general decrease in STEM content); DPES seemed responsive to these changes through adapting their undergraduate course requirements. Additionally, the committee notes the innovative approach of DPES offering 'prep courses', such as a chemistry preparation tutorial, for incoming students as an important innovation around admissions.

During our meetings we did not discuss alternative requirements for admission, nor does the Self Study document address alternative requirements for admission.

1.6. Resources

DPES is a large department, with 45 full-time and 3 part-time faculty members. That said, being an omnibus department with 4 programs plus the Professional MSc program, the faculty complement is lean in most subject areas. The faculty are leanest in the Physics program where there are four (4) tenure stream faculty and four (4) teaching stream faculty (and the actual number is lower due to various leaves, including research and study leaves).

The department has an excellent balance of tenure stream and teaching stream faculty. We particularly note the strong integration and mutual recognition of the two groups of faculty. In DPES, the cohesive and respectful interactions between research-focused and teaching stream faculty are the norm, and not always seen in other departments. DPES should be commended for this positive, collegial environment and esteem of expertise.

We were impressed by the investment in laboratory facilities since the last review. The analytical instrumentation facility (TRACES) is an impressive facility utilized by researchers and students, including undergraduate students with research projects. The teaching laboratories were a mixture of state-of-the-art and outdated. We heard that there are challenges in managing the teaching with increasing enrollment numbers and only three technicians to support the courses. More attention and investment are needed to ensure that all teaching laboratories, and not just some, are safe and accessible to all learners.

We toured the UTSC library and met with the DPES Subject Librarian. The library space (like most university libraries) is focused on student meeting and informal study space. The subject

librarian is very active in working with faculty and students, particularly teaching focused on developing student research skills. The librarian also assists with developing subject guides for courses. We did hear from undergraduate students a need for extended library hours and a need for communal meeting spaces.

1.7. Resources for Grad Programs

As described in the Self Study and made apparent in our interviews with Faculty, the complement of faculty in DPES have excellent broad expertise across their respective fields of study. We were impressed by the breadth of knowledge of the teaching stream faculty who were instructors for the Professional MSc program.

There is evidence that the financial support for the PhD program was sufficient. PhD students receive a minimum $23,500 per year plus tuition for up to five years, an amount that exceeds the minimum required stipend amount. Students are also encouraged to apply for national, provincial and institution scholarships.

We did not receive information regarding the financial arrangements for students enrolled in the Professional MSc program.

We did not hear any concerns expressed about supervisory loads nor did we observe any associated problems.

1.8. Quality and other indicators

The quality of DPES faculty is very impressive. The tenure stream research-focused faculty are a ‘research powerhouse’ for UTSC. The department has several Fellows of the Royal Society of Canada and holders of Canada Research Chairs, together with the numerous faculty receiving high-profile national and international awards.

The teaching stream faculty make important contributions in support of course design, undergraduate research activities, including pedagogical scholarship within their disciplinary areas. For example, the publications on Chemistry Education by teaching stream faculty were particularly impressive.

The DPES Self Study document provides ample evidence of quality indicators related to students. As the DPES study is divided by group (chemistry, physics, environmental science, environmental studies, etc.,) a global assessment is not possible, though each group does provide their own assessment. Following are some highlights:

- The Environmental Science program has very strong enrollment across all of its programs, with more than 500 students enrolled across all years of the program.
- The Environmental Studies program has shown a significant increase in enrollment over the past 9 years, from ~50 students to more than 200 students (with a slight decrease last year). The program is further enhanced with recent faculty hires.
- The Chemistry program has a very strong complement of tenure- and teaching- stream faculty with numerous teaching and research awards.
- The Physics and Astrophysics program demonstrates that they have high entrance requirements for incoming undergraduate students, and that their students are academically-focused with strong GPA outcomes.
- The PhD program has an impressively high proportion of students with major scholarships, and the students are highly productive, including publications in *Science*, *Nature Chemistry*, *Nature Geoscience*, *Nature Communications*, and the *Proceedings of the National Academy of Sciences*.

Another quality indicator of the DPES is program accreditation, wherein an external accreditation body confirms the quality and learning outcomes of a student program. Currently three Chemistry programs are accredited by the Canadian Society for Chemistry and the Major programs in Environmental Science and Environmental Studies are accredited by the Environmental Careers Organization (ECO) Canada.

As described elsewhere in our report, comparison to peer institutions is difficult given the omnibus nature of the department.

2 FACULTY AND RESEARCH

The quality of research outputs from research faculty was impressive, and comprehensively detailed in the Self Study. In summary, the DPES produces over 200 peer-reviewed publications annually, and consistently receives more than $2.5 million in competitive grant funding annually. Further, almost all the research faculty hold tri-council grants.

Given the omnibus nature of the department, it is not an easy task to benchmark research output compared to other Canadian or International units. That said, based on the evidence presented in the Self Study, we were very impressed by the research quality and output from the Department.

The Department is proud to host the first tri-campus MSc and PhD programs in Environmental

Sciences. Combined with the Professional Environmental Sciences MSc, DPES collectively represents 55-60% of all the affiliated graduate students at UTSC.

We agreed with faculty concerns around insufficient staffing, both faculty and teaching support staff. This is a serious issue given overall rising enrollments and future increases due to more activity on the UTSC campus. There did not appear to be a coherent departmental plan for prioritized 'asks' due in part to the broader constraints with a hiring freeze.

Given the limited number of faculty relative to the expansive disciplinary nature of DPES, it makes sense that each disciplinary grouping within the department has made strategic choices to focus on specific research areas as their strengths (e.g., theoretical and computational planetary science in Physics). Given that faculty and staff numbers need to increase to support the growing nature of departmental student enrollments, it makes sense that each disciplinary grouping within DPES continues to focus on specific strengths rather than become more diffuse in research excellence.

3 RELATIONSHIPS

During the site visit, we were impressed by the morale of the department faculty and staff. Based on our discussions and interactions, there were very positive interactions across programs and different roles (e.g., faculty, staff, and students). For example, at one point we probed one group of faculty about if they would prefer being a separate department. We heard emphatically that they very much preferred DPES with the broad range of interdisciplinary teaching and research opportunities that it provided, and that there we distinct benefits to remaining part of the larger department.

The Department had good relationships with other units on campus. The one exception is relationships with the campus Co-op office, which are strained as a result of different perspectives about where the ownership of the undergraduate Co-op programs should reside.

The Department clearly demonstrates strong relationships with the local community and organisations. Through the Professional MSc program, DPES has numerous industry and government connections.

4 ORG AND FINANCIAL STRUCTURE

The department's organisational and financial structure is appropriate and effective. In meeting with the DPES administrative staff, it was apparent that there were clear processes in

place for management departmental financial activities and supporting research activities. That said, workloads are high, particularly for support staff.

We did hear some minor disquiet about a move away from "Associate Chair (Discipline)" to discipline representatives now reporting to the unit head.

DPES is located in a fairly new building (the Environmental Science and Chemistry building) with excellent spaces and resources. We did note that it is unfortunate that the Physics group does not reside in the same building as the rest of DPES, as they reside in the Science Wing. This distancing may make it difficult for the Physics group to feel cohesion with the rest of their department, and Departmental leadership team are fully aware of this challenge. As noted earlier, some teaching labs need upgrades to ensure safety and accessibility for all learners.

We learned that the university will be moving to responsibility-based financial management, and hope that implementation of this strategy will result in increased flows of resources to DPES commensurate with the growing enrollments and success of the department.

5 LONG RANGE PLANNING

The current teaching and research activities of DPES are consistent with the University's academic plan and constitute a highly positive aspect of the university overall.

Fundraising is not a significant component of the DPES activities. The department does have an outreach - communications committee, but it understandably seems that fundraising is beyond the scope of an academic unit. Nonetheless, there is potential given the strong growth in the department alumni numbers and the growing importance of sustainability, environmental (especially climate) action, and social justice issues in society. Many universities are choosing to make these topics important components of their fundraising efforts, and the university (and department) might do well with a similar strategy.

The Unit leadership was strongly supported, and their contribution to the success of DPES was widely acknowledged. There are numerous changes ahead for DPES, including a change in Departmental Chair, a new Dean, and the opening of SAMIH. It was not clear that DPES had a strategic and/or succession plan to address these numerous changes that will occur over the next year. There are opportunities for further departmental growth and increased teaching, but strategic decisions are needed.

As the financial model evolves at the university, it should result in more resources for DPES and greater support for the robust departmental growth that is likely to continue into the future if increased university funding support is sustained along with the growth in student enrollments, research success, and positive societal impact. Again, given the growing societal need for sustainability, environmental solutions, climate action, and socially just solutions, DPES offers the university a way to become more prominent both nationally and internationally. The university must invest more in DPES in order to fully seize this opportunity.

6 INTERNATIONAL COMPARATORS

An assessment of DPES and its programs with other similar units is challenging given the omnibus nature of the department. Further, it is also difficult to compare the individual sub-groups with other units, as it is not 'like for like'. For example, comparing the DPES Chemistry group with another university's Chemistry Department is a difficult comparison. The department is a unique combination of disciplines and interdisciplinary synergy that is clearly thriving under a common departmental home.

In the Self Study document, each group provides its own narrative for their researchers and programs but does not provide comparisons with other similar units at other universities.

Based on our broad expertise, we feel that DPES, as a whole, is very strong as an interdisciplinary academic unit; it leads the way on campus for research graduate student enrollment, research outputs are high quality and taught programs are current, interdisciplinary and distinctively experiential. It is the integration of several disciplines that fosters a spirit of interdisciplinary collaboration, particularly for the disciplines co-located within the same building.

As societal need in areas related to sustainability, environment, climate change and social justice continue to grow, so will the utility and stature of DPES, particularly if the university invests more to support the department growth, excellence, and impact that is already taking place. DPES is already a gem in the crown of the university and provides the university with the clear opportunity to grow its national and international stature.

C. Recommendations

*Please make **at least three recommendations** for specific steps to be taken that will lead to the continuous improvement of each academic program/unit listed in the Terms of Reference,*

distinguishing between those the program/unit can itself take and those that require external action.
Please clarify when a recommendation applies to more than one program/unit.
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.***

Based on the Self Study document and in our conversations with Faculty, Staff, and Students, we have identified 5 recommendations:

1. ***Co-op Program Challenges***. A topic that was raised with the overwhelming majority of our individual meetings and discussions was the management of the Co-op program for the undergraduate programs. DPES desires to move the undergrad organisation (and staff lines) into the department and out of the existing Co-op office that reports to the Dean. DPES is very proud of the Professional MSc's co-op/internship program with very high placement and extension rates. This impressive placement program was established in DPES with the start of the Professional MSc program.

   Co-op and applied learning are signature features of the UTSC campus and of DPES. In 2023, 11% of the UTSC co-op new enrollments were from DPES, including students from Chemistry and Environmental Science programs. According to UTSC Co-op office data, from 2019 to 2023, 73% of Environmental Sciences co-op seekers found positions, with an average of 1.5 job interviews per seeker. Of note is that this statistic only includes active placement seekers, and does not capture students who stop seeking a position. A challenge for placement seekers seems to be the need for course sequences/pathways that should, in principle, not impede students' time to completion if they select a co-op option.

   It is impossible for us, with our short visit to campus, to fully understand the issues and implications of this change, and to provide a definitive recommendation as to management of the Co-op program. But it is very clear that there is an issue that must be addressed. The Department is clearly not happy with the level of support and collaboration that they are currently receiving. There are also risks with having the Department manage its own co-op program, including inter-unit competition for community and industry connection, including the potential for confusion from partners between DPES and UTSC.

   This matter should be a priority for the new Dean. There should be a series of focused

conversations around addressing the breakdown of trust and cooperation, involving Co-op office leadership, departmental representation, and the Dean's office, with a decision on the way forward (even if as a 1-2 year pilot) by Fall 2024. Ultimately, the goal of the Co-op program for DPES should be to (i) improve the experiential learning for students; (ii) ensure subject matter voices are present in designing and delivering the co-op support for DPES students, and (iii) capitalize on the coherence and economies of a central unit.

One possible idea is for the central Co-op office to collaborate with DPES to hire one or more Co-op staff members who will, by virtue of their position responsibilities, be housed/embedded in DPES, but also have a clear liaison responsibility to the central Co-op office. It is critical that DPES student experience be paramount even if this means more university resources need to be focused on making sure off-campus partners also see their collaborations with the university as a winning venture.

2. ***Planning for Scarborough Academy of Medicine and Integrated Health (SAMIH).*** The current SAMIH investment on the UTSC campus creates clear enrollment opportunities for DPES, particularly for chemistry and physics for life science students. Given that SAMIH students will be on campus starting Fall 2024, we recommend accelerated planning for how these students will be accommodated, especially with respect to the teaching labs that will be needed. There are currently safety issues in the chemistry laboratories, such as line of sight for instructors who must be able to observe all students. Furthermore, there are currently some challenges around student preparedness and confidence in laboratory settings. Accessibility for all types of learners is also limited, and the resources for teaching lab technical support is stretched too thinly. The university must make it a top priority to address current limitations and ensure that the fixes will be able to accommodate the technical support demands that will arise with increased student numbers.

3. ***Integration of Physics Group into the Department.*** We were struck and impressed by the Physics faculty group who put on a full Physics BSc program with a skeleton groupof 8 faculty members. We learned that 4 out of the 8 Physics faculty (tenure track plus teaching) were on sabbatical and leave this year (with the same or similar numbers next year). It is hard to see how this is sustainable, let alone how it can support growth in student numbers (e.g., associated with the SAMIH). Conversely, we also learned that opportunities to grow the faculty complement were not taken up by Physics faculty which suggests a degree of internal disharmony. We wonder if the physical separation from the rest of the DPES department is a barrier. For example, the teaching stream faculty in Physics, in contrast to the other DPES Teaching Stream faculty, said they rarely had the opportunity to collaborate on pedagogy or innovation projects with other instructors. Lab

technical support is also an issue that needs to be addressed.

We recommend making it a priority (e.g., because of likely near-term demand growth due to the SAMIH) to develop a collaborative plan that addresses the challenges noted above in a pragmatic and sustainable manner. This plan will undoubtedly require more investment of resources, but increased enrollments should justify this investment, as will the fact that a more well-functioning and integrated Physics program should serve to increase the stature of DPES and the university.

4. ***Equity, Diversity and Inclusivity (EDI).*** The importance of EDI is prominent in UT and UTSC documents and priorities but was much less visible in the DPES Self Study document. We learned that DPES does have a dedicated committee to engage to help promote EDI, and we heard evidence that EDI is integrated into at least some of the curriculum. DPES does have a diverse student body. However, the students that we met with were diverse and keen to see greater prominence of EDI initiatives (e.g., equity and inclusion oriented, including the teaching of knowledge from more diverse sources and perspectives); they would be useful and enthusiastic partners in planning and implementing such endeavours. We recommend that DPES ensure that EDI is prominent in department activities, and with speakers/visitors brought in to interact with the students. We recognize that increased diversity in the faculty complement is a slow process (particularly in tight financial conditions and in a department where people like their colleagues and don't leave). Nonetheless, creating a more diverse faculty should also be a goal. In the meantime, an approach may be to work with current faculty, staff, and students to embed more EDI in departmental assessment, program design, classroom climate, and other areas. We also encourage working with partners from across UTSC, as well as from community and other universities, where relevant expertise can be brought in.

5. ***Graduate Students.*** In our meeting with graduate students two issues of concern were discussed. First, the graduate students found interactions with faculty and peers at the St. George campus to be challenging. Part of the issue was physical distance, and the time/resources required to visit the other campus. Further, the students felt siloed at UTSC, and not easily able to access infrastructure across the tri-campus. Second, the graduate students expressed concerns about TA hours, and felt that their actual time spent undertaking TA hours far exceeded their budgeted hours. We would recommend a review of TA activities and if necessary, a calibration of TA hours and workloads so that students only work for the hours they are paid.

Terms of Reference (appended for reference)

Terms of Reference:

The Terms of Reference are intended to establish the parameters of the cyclical review process and provide the framework of the review report.

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** (self-study, site visit, review report) **must immediately be brought to the attention of the commissioning officer and routed through appropriate University channels for resolution.**

Program(s) under review:	Applied Climatology: Min (Science) Astronomy and Astrophysics: Min (Science) Biochemistry, B.Sc.: Maj and Co-op Biological Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op Environmental Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op Environmental Geoscience, B.Sc.: Spec and Co-op Environmental Physics, B.Sc.: Spec and Co-op Environmental Science, BSc: Maj and Co-op; Min Environmental Studies, BA: Maj Global Environmental Change (formerly Environmental Biology), B.Sc.: Spec and Co-op Natural Sciences and Environmental Management: Min (Science) Physics and Astrophysics, BSc: Spec; Maj Physical and Mathematical Sciences, B.Sc.: Spec Physical Sciences, B.Sc.: Maj Certificate in Sustainability (Category 2) Combined Degree Programs with FASE MEng Combined Degree Programs with MEnvSc Combined Degree Programs with OISE MT Master of Environmental Science (M.Env.Sc.) Environmental Science, Ph.D. Environmental Science, M.Sc. (approved to begin in May 2023)
Division/unit under review:	Department of Physical and Environmental Sciences (DPES)
Commissioning officer:	Professor William A. Gough Vice-Principal Academic & Dean
Date of scheduled review:	Wednesday, March 27th and Thursday, March 28th, 2024

Template Instructions:

These terms of reference have been designed to be customized to accommodate Provostial reviews of divisions (and the programs they offer) as well as Decanal Reviews of units and their programs.

Reviewers are asked to comment explicitly upon the following:

1 Program(s)

The quality of each academic program and the learning environment of the students in each program must be addressed explicitly in the self-study and the external reviewers' report.

For each discrete program that is part of the review as defined in the Terms of Reference,

please consider and comment on the following:

1.1 Program objectives and key features

a) 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

b) Evidence that the following have been substantially considered in the context 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*

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

c) (Where appropriate) Unique curriculum or program innovations, creative components,

significant high impact practices

d) Initiatives taken to enhance the quality of the program and the associated learning and teaching environment.

1.2 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 and effectiveness 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) 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

1.3 Program requirements for graduate programs only

a) Clear rationale for program length that ensures that students can complete the program-level learning outcomes and requirements within the time required

b) Evidence that each graduate student in the program is required to take all of the course requirements from among graduate-level courses; evidence of sufficient graduate-level courses that students will be able to meet this requirement

c) For research-focused graduate programs, clear indication of the nature and suitability of the major research requirements for degree completion

1.4 Assessment of teaching and learning

a) Appropriateness and effectiveness of the methods for assessing student achievement of the program-level learning outcomes and degree level expectations

b) Appropriateness and effectiveness 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

1.5 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.

1.6 Resources

In making assessments related to resources here and in 1.7, reviewers must recognize the institution's autonomy in determining priorities for funding, space and faculty allocation.

Given the program's 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 utilization of existing human, physical and financial resources

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

1.7 Resources for graduate programs only

In making assessments related to resources here and in 1.6, reviewers must recognize the institution's autonomy in determining priorities for funding, space and faculty allocation.

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

a) Evidence that faculty have the recent research or professional/clinical expertise needed to sustain the program, promote innovation, and foster an appropriate intellectual climate

b) Where appropriate to the program, evidence that financial assistance for students will be sufficient to ensure adequate quality and numbers of students

c) Evidence of how supervisory loads will be distributed, in light of qualifications and appointment status of the faculty.

1.8 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) Quality indicators related to students (e.g., grade level for admission; applications and registrations; attrition/retention rates; times-to-completion; final year academic achievement; graduation rates; scholarly output; success rates in provincial and national scholarships; competitions; academic awards; student in-course reports on teaching; and commitment to professional and transferable skills)

d) Quality indicators related to program graduates (e.g., rates of graduation; employment six months and two years after graduation; postgraduate study; "skills match"; and alumni reports on program quality when available and when permitted by the Freedom of Information and Protection of Privacy Act (FIPPA). Auditors will be instructed that these items may not be available and applicable to all programs.)

e) Any additional indicators of quality identified by the division or academic unit, including but not limited to data to support the assessment of progress towards fulfilling the plans, priorities and commitments identified in 1.1.a and 1.1.b

f) How the program compares to the best in its field among peer institutions in Canada, North America and internationally, including areas of strength and opportunities

2 Faculty/Research

- Scope, quality and relevance of faculty research activities.
- Appropriateness of the level of activity relative to national and international comparators.
- Appropriateness of research activities for the undergraduate and graduate students in the Department.
- Faculty complement plan.
- Appropriateness and effectiveness of the academic unit's use of existing human resources. *In making this assessment, reviewers must recognize the institution's autonomy in determining priorities for funding, space and faculty allocation*

3 Relationships

- Strength of the morale of faculty, students and staff.
- Scope and nature of relationships with cognate Faculties, academic departments and units.
- Extent to which the department has developed or sustained fruitful partnerships with other universities and organizations in order to foster research, creative professional activities and to deliver teaching programs.
- Scope and nature of the department's relationship with external government, academic and professional organizations.
- Social impact of the department in terms of outreach and impact locally and nationally.

4 Organizational and Financial Structure

- The appropriateness and effectiveness of the department's organizational and financial structure
- The appropriateness with which resource allocation, including space and infrastructure support, has been managed. *In making this assessment, reviewers must recognize the institution's autonomy in determining priorities for funding, space and faculty allocation*
- Opportunities for new revenue generation.

5 Long-Range Planning Challenges

- Consistency with the University's academic plan.
- Appropriateness of:
  - Complement plan, including balance of tenure-stream and non-tenure stream faculty
  - Enrolment strategy
  - Student financial aid
  - Development/fundraising initiatives
  - Management and leadership.

6 International Comparators

Assessment of the department and the program(s) under review relative to the best in Canada/North America and internationally, including areas of strength and opportunities.

UNIVERSITY OF TORONTO

OFFICE OF THE VICE-PROVOST,
ACADEMIC PROGRAMS

December 9, 2024

Professor Karin Ruhlandt
Vice-Principal, Academic & Dean
University of Toronto Scarborough

Dear Professor Ruhlandt:

Thank you for forwarding the report of the March 27-28, 2024 external review of the Department of Physical & Environmental Sciences. The following programs were reviewed:

Applied Climatology: Min (Science)
Astronomy and Astrophysics: Min (Science)
Biochemistry, B.Sc.: Maj and Co-op
Biological Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op
Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op
Environmental Chemistry, B.Sc.: Spec and Co-op; Maj and Co-op
Environmental Geoscience, B.Sc.: Spec and Co-op
Environmental Physics, B.Sc.: Spec and Co-op
Environmental Science, BSc: Maj and Co-op; Min
Environmental Studies, BA: Maj
Global Environmental Change (formerly Environmental Biology), B.Sc.: Spec and Co-op
Natural Sciences and Environmental Management: Min (Science)
Physics and Astrophysics, BSc: Spec; Maj
Physical and Mathematical Sciences, B.Sc.: Spec
Physical Sciences, B.Sc.: Maj
Certificate in Sustainability (Category 2)
Combined Degree Programs with FASE MEng
Combined Degree Programs with MEnvSc
Combined Degree Programs with OISE MT
Master of Environmental Science (M.Env.Sc.)
Environmental Science, Ph.D.
Environmental Science, M.Sc. (approved to begin in May 2023)

As indicated in our *Statement of Institutional Purpose*, the University of Toronto is committed "to being an internationally significant research university, with undergraduate, graduate and professional programs of excellent quality." This quality is assessed through the periodic appraisal of programs and units, which considers how our research scholarship and programs compare to those of our international peer institutions and assesses the alignment of our programs with established degree-level expectations. The University views the reports and

recommendations made by external reviewers as opportunities to celebrate successes and identify areas for quality improvement.

The reviewers praised DPES for offering up-to-date undergraduate curricula that align with current disciplinary trends. Notably, the reviewers commended the Department's extensive experiential learning opportunities and robust co-op programs. They congratulated DPES on its thriving research environment for graduate students with an excellent focus on preparing PhD students to enter the workforce – in academia and beyond. They highlighted the impressive quality of DPES faculty and exceptionally strong departmental research; and noted that teaching stream faculty are leading technological and pedagogical innovations. Finally, the reviewers highlighted that DPES has made transformative progress since their last review, resulting in a net increase of faculty and staff; the Department benefits from stable leadership and strong morale; and the unit is housed in a modern building with excellent facilities.

I am writing at this time:

1. to request your administrative response to this report, which should include a plan for implementing the recommendations; these plans should be captured in the enclosed table;
2. to request your feedback on the review summary component of the draft *Final Assessment Report and Implementation Plan*; and
3. to outline the next steps in the process.

1. Request for Administrative Response and Implementation Plan:

In your **Administrative Response**, please address the following areas raised by the reviewers and their impact on the academic programs, *along with any additional areas you would like to prioritize*.

For each area you address, please provide an **Implementation Plan** that identifies actions to be accomplished in the immediate (six months), medium (one to two years) and longer (three to five years) terms, and who (Program Director, Chair, Dean) will take the lead in each area. If appropriate, please identify any necessary changes in organization, policy, or governance; and any resources, financial and otherwise, that will be provided, including who will provide them.

- The reviewers highlighted significant challenges and differences of opinion related to management of the undergraduate co-op program. They recommended that UTSC leadership engage in consultations with all stakeholders to determine appropriate future directions for optimal stewardship of the program.
- The reviewers raised concerns that graduate students in DPES feel isolated from the St. George campus, encounter difficulties accessing tri-campus resources and infrastructure, and report that their Teaching Assistant responsibilities often require more time than is budgeted. They recommended exploring approaches to ensure that the unit's graduate student population is appropriately supported.

- The reviewers recommended that the unit engage in a strategic faculty complement planning process; and that they prioritize ensuring appropriate coverage in Physics and adding to the diversity of the faculty complement when hiring opportunities permit. They also highlighted opportunities to strengthen the integration of the Physics faculty group with the rest of the unit, and to encourage greater collaboration and community among all DPES faculty.
- The reviewers noted limited coverage of Equity, Diversity, and Inclusion (EDI) activities in the unit's self-study document. They broadly recommended that DPES take steps to ensure that EDI is made more prominent in departmental activities, and that they engage with students in pursuing such endeavors.
- The reviewers highlighted a lack of clarity around whether DPES has developed plans to address numerous upcoming leadership and growth changes that will significantly affect them. They emphasized the critical importance of strategic planning and decision making for the unit.
- Noting the impending arrival of SAMIH students at UTSC and related enrolment opportunities for DPES, the reviewers recommended accelerated planning for accommodating these learners on campus with a particular focus on teaching laboratories. They also urged unit and divisional leadership to assess available laboratory spaces and ensure that these spaces are updated appropriately to meet technical support demands and to accommodate student accessibility needs.

Please prepare this response in consultation with the unit under review. As part of this consultation, please request a brief administrative response from the unit that focuses on items within their control. Please reflect this consultation and respond to the key elements of the unit's response in your response.

Finally, please confirm the **date of the next review** and your plans for **monitoring the implementation of recommendations** until then. I will ask you to provide a brief report to me midway between the 2024 review and the year of the next site visit.

2. Draft of Final Assessment Report (including Review Summary)

In Winter 2025, my office will provide a draft version of the *Final Assessment Report and Implementation Plan* (FAR/IP), which will include a summary of the review of the Department of Physical & Environmental Sciences. At that time, we will request your feedback regarding tone or accuracy of the summary component, and your response to any information that is requested in the comments. This public-facing document becomes part of the governance record.

3. Next Steps

Reviews of academic programs and units are presented to University governance as a matter of University policy. Under the University of Toronto Quality Assurance Process (UTQAP), the Vice-

Provost, Academic Programs prepares a report on all program and unit reviews and submits these periodically to the Committee on Academic Policy and Programs (AP&P).

The review of the Department of Physical & Environmental Sciences will be considered by AP&P at its meeting on **Thursday, April 10th, 2025. Please plan to attend this meeting and ensure that unit leadership also attends.** Your presence is important and will allow you to respond to any questions the committee may have regarding the report, and your administrative response and implementation plan. An overview of what happens at AP&P is available on our website.

I would appreciate receiving your completed administrative response and plan for implementing recommendations, as well as a copy of the unit's response, and any comments on the draft FAR/IP by **Thursday, March 6th, 2025**. This will allow my office sufficient time to prepare materials for the AP&P meeting.

The review summary and the Dean's administrative response are the two key components of the FAR/IP, which will be finalized after the AP&P meeting and distributed to you, the unit lead(s), the Governing Council secretariat, and the Quality Council, and posted on our website, as required by the UTQAP.

Please feel free to contact me or Emma del Junco, Academic Reviews and Planning Specialist, should you have any questions.

Sincerely,

Nick Rule
Vice-Provost, Academic Programs

cc.
Kevin Mak, Academic Programs Officer, Office of the Vice-Principal, Academic & Dean, UTSC
Lachmi Singh, Director, Academic Programs, Planning and Quality Assurance
Emma del Junco, Academic Reviews and Planning Specialist
David Lock, Academic Reviews and Planning Specialist
Alexandra Varela, Coordinator, Academic Programs

UNIVERSITY OF TORONTO SCARBOROUGH

Office of the Vice-Principal Academic and Dean

March 20, 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: External Review of the Department of Physical and Environmental Sciences, University of Toronto Scarborough

Dear Professor Rule,

Thank you for your letter of December 9, 2024, requesting my administrative response to the March 2024 external review of the Department of Physical and Environmental Sciences. I want to extend my gratitude to the review team—Simon Bates, Vice-Provost and Associate Vice-President, Teaching & Learning, and Professor of Teaching, Department of Physics & Astronomy, University of British Columbia; Jeffrey McKenzie, Professor, Department of Earth & Planetary Sciences, McGill University; and Jonathan Overpeck, Samuel A. Graham Dean, School for Environment and Sustainability, University of Michigan—for their consultation with the Department during the site visit from March 27-28, 2024, and for their Report, which was finalized on June 13, 2024, and shared with the Department.

We deeply appreciate the reviewers' commendation of the Department's curricula in relation to current disciplinary trends, as well as the Department's extensive experiential learning and co-op offerings for undergraduate students. In addition to praising the flourishing research environment created by the Department for its graduate students and for preparing PhD students to pursue different pathways, the reviewers recognized the technological and pedagogical innovations led by the Department's faculty members, noting the transformative progress undertaken by the Department since its last review.

The report from the review team identifies several areas for enhancement and development, including determining appropriate future directions for optimal stewardship of the undergraduate co-op program; exploring options to ensure the Department's graduate student population is appropriately supported; encouraging greater collaboration and community among all faculty members of the Department; making Equity, Diversity, and Inclusion (EDI) more prominent in departmental activities; engaging in strategic planning to address future leadership and growth changes; and assessing available laboratory spaces in relation to technical support demands and student accessibility needs. With this letter, I have included a table summarizing the responses to the specific recommendations of the reviewers and anticipated timelines for implementation, where appropriate.

Once again, I thank the review team for their insightful and valuable review of the Department and its programs. I look forward to supporting the Department in implementing the recommendations of this report. The Dean's Office will monitor the implementation of recommendations through ongoing meetings with the Chair of the Department of Physical and Environmental Sciences. An interim report to the Office of the Vice-Provost, Academic Programs will be prepared in **Fall 2028**. The next external review of the Department will take place **no later than the 2031-32 academic year**.

Sincerely,

Professor Karin Ruhlandt
Vice-Principal Academic & Dean

Arts & Administration Building, 1265 Military Trail, Toronto, ON, M1C 1A4 Canada
Tel: +1 416 287 7027 · www.utsc.utoronto.ca

2023-24 UTQAP Review of the UTSC Department of Physical and Environmental Sciences - Review Recommendations

Please do the following for each recommendation in the table:

- If you **intend** to act on a recommendation, please provide an **Implementation Plan** identifying actions to be taken, the time frame (short, medium, long term) for each, and who will take the lead in each area. If appropriate, please identify any necessary changes in organization, policy or governance; and any resources, financial and otherwise, that will be provided, and who will provide them.
- If you **do not** intend to act on a recommendation, please briefly explain why the actions recommended have not been prioritized.
- In accordance with the UTQAP and Ontario's Quality Assurance Framework, "it is important to note that, while the external reviewers' report may include **commentary** on issues such as faculty complement and/or space requirements when related to the quality of the program under review, **recommendations** on these or any other elements that are within the purview of the university's internal budgetary decision-making processes must be tied directly to issues of program quality or sustainability" (emphasis added)
- You may wish to refer to the sample table provided by the Office of the Vice-Provost, Academic Programs

Request Prompt *verbatim from the request*	**Rec. #**	**Recommendations from Review Report** *verbatim from the review report*	**Unit Response**	**Dean's Response**
The reviewers highlighted significant challenges and differences of opinion related to management of the undergraduate co-op program. They recommended that UTSC leadership engage in consultations with all stakeholders to determine appropriate future directions for optimal stewardship of the program.	1.	"[The management of the undergraduate co-op program] should be a priority for the new Dean. There should be a series of focused conversations around addressing the breakdown of trust and cooperation, involving Co-op office leadership, departmental representation, and the Dean's office, with a decision on the way forward (even if as a 1-2 year pilot) by Fall 2024. Ultimately, the goal of the Co-op program for DPES should be to (i) improve the experiential learning for students; (ii) ensure subject matter voices are present in designing and delivering the co-op support for DPES students, and (iii) capitalize on the coherence and economies of a central unit."	This is an issue that was raised extensively in our self-assessment report. We are delighted that the external reviewers emphasized the need to rectify the multitude of issues that make the performance of our co-op programs far from satisfactory. Moving forward, the next major aspiration of the department is to take full control of our co-op programs; especially in Environmental Sciences (EES). Counter to the significant growth of our EES (Major, Minors, and Specialist) programs over the past 6-7 years, the enrollment trends in their co-op counterparts have been disturbingly stagnant with no discernible signs of improvement (i.e., collectively less than 50 EES co-op students). While the Arts & Science Co-op Office has recently embarked on a promising exercise that aims to address some of the long-standing dysfunctionalities of the programs, such as the development of proper course sequencing that will increase the number of summer offerings, we have fundamentally different perspectives regarding the framework that should be in place	Co-op is a historic strength of UTSC, and the Dean's Office is committed to the success of these programs. As an initial step toward addressing the concerns identified by reviewers and the department, the Arts & Science Co-Op Office has hired a dedicated liaison to support programming in the sciences. We have also completed a review of all required course pathways for students in the department's co-op programs and committed funding to better facilitate regular timetabling; this has been an ongoing barrier to program completion. We are in the early stages of this new structure and will need to assess its success. We acknowledge that the department has a different perspective on supporting the professional development of students, particularly at the undergraduate level. With that in mind, I am committed to engaging in strategic discussions with academic leaders and with the Arts & Science Co-Op office to ensure that appropriate supports are in place for the long-term success of co-op and experiential learning

			to ensure a rich professional development for our students. The astonishing record of our MEnvSci internship team -100% internship placements annually, and more than 70% extensions of their internships and/or full-time employment offers- sets an "academic model" that we aspire to implement to our co-op programs. These tangible deliverables are the result of an academically rigorous curriculum, rich in experiential-learning opportunities, and tightly linked with the workforce (industry, government, non-profit organizations). From a departmental perspective, having our undergraduate co-op programs under our supervision will establish the department as the focal academic unit within the UofT system that offers comprehensive education and promising career prospects in Environmental Sciences. A fully functional undergraduate EES co-op, combined with our Professional MEnvSci program and the proposed Work Integrated Learning pathway in our PhD program will allow us to establish the Department of Physical and Environmental Sciences as an academic unit that offers clear linkages with the workforce for BSc, MSc, and PhD students! It is our hope that this change in the administration of our co-op program, endowed with the appropriate human and financial resources, will be in the foreseeable future. As a first step, our plans involve the EES undergraduate co-op, but we do intend to request full administrative oversight of the CHM programs within the next 2-3 years.	not only in the department but across the campus as a whole. At this stage, we are interested in taking a coordinated approach that supports and connects needs across the campus rather than implementing department-specific offices. We are considering the possibility of an external review of co-op at UTSC as a part of the assessment of next steps.
The reviewers raised concerns that graduate students in DPES feel isolated from the St. George campus,	2.	"In our meeting with graduate students two issues of concern were discussed. First, the graduate students found interactions with faculty	The vast majority of these concerns have been raised by students, who are affiliated with tri-campus graduate programs of cognate academic	Almost half of UTSC graduate students are "affiliated" and belong to tri-campus graduate units that are largely based downtown. The Vice-

encounter difficulties accessing tri-campus resources and infrastructure, and report that their TA responsibilities often require more time than is budgeted. They recommended exploring approaches to ensure that the unit's graduate student population is appropriately supported.		and peers at the St. George campus to be challenging. Part of the issue was physical distance, and the time/resources required to visit the other campus. Further, the students felt siloed at UTSC, and not easily able to access infrastructure across the tri-campus. Second, the graduate students expressed concerns about TA hours, and felt that their actual time spent undertaking TA hours far exceeded their budgeted hours. We would recommend a review of TA activities and if necessary, a calibration of TA hours and workloads so that students only work for the hours they are paid."	units primarily located at the St. George campus. DPES has already reached out to the departments of Chemistry and Physics. Starting from next year, we will play a more active role with the delivery of the seminar series of their units and they will do the same for ours. There will be more opportunities for cross-fertilization through nomination of speakers, as well as live streaming of all the talks. That said, the department is very open to instigate more initiatives that will bring the three campuses of the University of Toronto system closer, assuming that the required resources are available. As far as the TA activities are concerned, the department has recently completed a comprehensive review of our TA assignments and we are happy to report two major advancements: (i) Courses that needed extra support have -on average- received a 10% increase in the allocated TA hours. (ii) The tasks assigned to TAs have been revisited to ensure optimal use of the existing resources for several courses. We have not received any complaints by any of our graduate students so far. We are committed to closely monitor this issue and rectify any problems that may be raised in the future.	Dean Graduate & Postdoctoral Studies at UTSC regularly holds events and workshops to foster a unique graduate community on campus. The Graduate Chair from Chemistry tries to regularly meet with UTSC graduate students in person and we will encourage leaders from other graduate units to do the same. The Dean's Office appreciates the department's collaborations with other cognate units at the St. George campus to bring graduate students from that campus and UTSC together for various initiatives. We also support the department's efforts to review and optimize the allocation of tasks and hours for TA activities across different courses. We look forward to engaging in further discussion with the department about how these processes will connect to the campus-wide implementation of the planned new budget model to ensure appropriate supports.
The reviewers recommended that the unit engage in a strategic faculty complement planning process; and that they prioritize ensuring appropriate coverage in Physics and adding to the diversity of the faculty complement when hiring opportunities permit. They also highlighted opportunities to strengthen the integration of the Physics faculty group with the rest of the unit, and to	3.	"We learned that 4 out of the 8 Physics faculty (tenure track plus teaching) were on sabbatical and leave this year (with the same or similar numbers next year). It is hard to see how this is sustainable, let alone how it can support growth in student numbers (e.g., associated with the SAMIH). Conversely, we also learned that opportunities to grow the faculty complement were not taken up by Physics faculty which suggests a degree of internal disharmony. We wonder if the physical separation from the rest of the DPES department is a barrier. For example,	The approval of all the sabbatical/study leaves during the academic year 2022-2023 was an executive decision made by the leadership of the department, in order to accommodate a multitude of health/mental issues raised by our faculty members after 2.5 years of the pandemic. It was a one-time-only decision to support our academic personnel and allow them to recover from the toll of these extraordinary times. The physical separation of the physics group from the rest of the department is certainly an issue….and an unfortunate decision that was made in 2014	Recognizing the long after-effects of the COVID-19 pandemic and the challenges to collegiality within our community due to global geopolitical uncertainties, the Office of the Vice-Dean Faculty Affairs, Equity, and Success (OVDFAES) has designated 2024-25 as the Year Towards Restoration, with new initiatives organized aiming to transform the institutional culture of UTSC into a more restorative one. We are pleased also to note that three faculty members from the Department of Physical and Environmental Sciences are part of this year's

encourage greater collaboration and community among all DPES faculty.		the teaching stream faculty in Physics, in contrast to the other DPES Teaching Stream faculty, said they rarely had the opportunity to collaborate on pedagogy or innovation projects with other instructors. Lab technical support is also an issue that needs to be addressed. We recommend making it a priority (e.g., because of likely near-term demand growth due to the SAMIH) to develop a collaborative plan that addresses the challenges noted above in a pragmatic and sustainable manner. This plan will undoubtedly require more investment of resources, but increased enrollments should justify this investment, as will the fact that a more well-functioning and integrated Physics program should serve to increase the stature of DPES and the university."	during the construction of the ESC building. We are hopeful that the ongoing development in our campus will offer an opportunity for space re-allocation that will make it feasible for the physics group to come closer to the rest of the department. Of equal importance is our proposal for a major renovation of our A-level physics labs (please refer to our self-assessment study). The proposed changes will not only enrich the learning experience of our students but will also allow us to accommodate the enrollment increase from the establishment of SAMIH. Last but not least, there is a plan for a new faculty position in the area of environmental physics that will not only allow to support our dynamic specialist program but will also bring (intellectually) closer the disciplines of Environmental Sciences and Physics. Once the current hiring freeze is removed, this position will be one of our strategic priorities.	Mentoring Excellence and Diversity Advisory Committee (MEAD), which advises on and provides resources for the professional development of faculty and librarians. In addition, DPES faculty are active members of two OVDFAES-funded Mentorship Partnerships focused on (1) sensory, affective, imaginative and land-based (SAIL) pedagogy and (2) sharing Indigenous knowledge and learnings. Mentorship Partnerships aim to foster community and learning among faculty and librarians. DPES participation affirms faculty need for such opportunities; and DPES leadership has been integral to their success. Several capital projects are currently underway at the University of Toronto Scarborough, including the construction of the Myron and Berna Garron Health Sciences Complex (SAMIH) and the development of Phase 2 of the Environmental and Related Technologies Hub. My office and I look forward to advocating spacing (re-)allocation needs on behalf of the department when engaging in discussions with the Office of the Vice-President & Principal and the Office of the Vice-Principal Research and Innovation as these projects continue and near completion. My office and I appreciate the department's desire for renovated physics lab spaces to enhance the student experience and the identification of environmental physics as a potential area for future hiring. In the current budget environment, my office is actively working to align future hiring and capital projects with campus strategic priorities, while being mindful of the Physics group's current needs within the department.

	4.	"We recognize that increased diversity in the faculty complement is a slow process (particularly in tight financial conditions and in a department where people like their colleagues and don't leave). Nonetheless, creating a more diverse faculty should also be a goal."	As noted during the site visit of the external reviewers, the department has made remarkable progress in achieving a gender-balanced faculty membership over the past ten (10) years; especially if we consider that we are a STEM department. The department has also been actively involved with academic initiatives targeting a multitude of equity-deserving groups, e.g., Environmental Anthropology. We are intensely committed to continue with these initiatives for years to come.	UTSC is committed to equity, diversity, and inclusion in its goal of inspiring inclusive excellence. This commitment is reflected in our faculty hiring practices and our success in welcoming Black and Indigenous colleagues to UTSC through the UTSC Pathway to Parity program (supported by funding from the University Provost), a concerted effort to increase the number of Black and Indigenous faculty to reflect the community and student populations we serve. DPES is a valued partner in this work, having launched one (ultimately unsuccessful) recruitment effort in recent years and leading a Pathway hire in 2024-25. The current Pathway search is in Environmental Studies and attracted a gender and racially diverse pool of applicants, boding well for future hiring efforts. We look forward to continuing to collaborate with the department on ongoing planning toward the further diversification of faculty and related structural changes that support inclusive excellence across the campus. Currently, three of the 17 members (including 2 Co-Chairs) of UTSC's Mentoring Excellence and Diversity Advisory Committee (MEAD) are faculty members from the Department of Physical and Environmental Sciences. Notably, all three of these faculty members are women, and one is a person of colour. MEAD advises on and provides resources for the professional development of faculty and librarians.
The reviewers noted limited coverage of Equity, Diversity and Inclusion activities in the unit's self-study document. They broadly recommended that DPES take steps to ensure that EDI is made more prominent in departmental activities,	5.	"…the students that we met with were diverse and keen to see greater prominence of EDI initiatives (e.g., equity and inclusion oriented, including the teaching of knowledge from more diverse sources and perspectives); they would be useful and enthusiastic partners in planning and implementing such endeavours."	DPES has a dedicated and extremely active committee to deal with Equity, Diversity and Inclusion (EDI) issues, and its mandate is completely aligned with the UTSC mission. The purpose has been to promote initiatives that remove barriers to access opportunities/resources for faculty, staff, and	The department has been actively involved in the campus-wide curriculum review, which since 2020 has been working to reflect equity, accessibility, anti-racism, anti-colonialism, and Indigeneity in curriculum and pedagogy, as well as student mental health and well-being. We have included in our formal communications

and that they engage with students in pursuing such endeavors.			students and inspire intellectual growth over the entire EDI spectrum. Most of these initiatives are planned and discussed within the EDI team and are communicated by the Chair's office. Faculty who are involved in campus-wide initiatives, such as campus EDI committee, microaggression in the classroom, EDI in Teaching etc. share insights with the team and work towards departmental EDI goals. The Dean's office and DPES have dedicated funding for faculty to work and implement EDI principles in our program and course delivery. One such example is the Pedagogies of Inclusive Excellence (PIE) fund that is available for DPES faculty to incorporate inclusive pedagogies, including Indigenous content in our curriculum. We are extremely proud to report that DPES has achieved an impressive success rate with the PIE fund, and the successful proposals include learning opportunities conducive to the EDI principles across a multitude of A-,B-C-, and D-level courses. DPES faculty, staff, and students are also increasingly engaged with the Indigenous history and knowledge of the Peoples that populated the land we live on today. A recent event that was sponsored by a PIE fund initiative was held at DPES (e.g., workshops with Indigenous collaborators and colleagues) on June 27, 2023: Walking Together - Implementing Indigenous pedagogies in Environmental Sciences. During this workshop, the participants discussed how to include in the course material, Indigenous teaching and the history of racism and colonialism, highlighted the fear of faculty in getting it wrong and offering inadequate content.	(including the UTSC Campus Curriculum Review Working Circle's Resource Hub) to academic units examples of resources to consult as they incorporate different elements of EDI in their development of curriculum, and we will continue to partner with the department in the implementation and deepening of this work. UTSC has dedicated educational developers to assist the department in developing curriculum that centres universal design for learning and anti-racist pedagogies. In addition, the UTSC's Mentoring Excellence and Diversity Advisory Committee (MEAD) advises on and provides resources for the professional development of faculty and librarians. My office is committed to continuing to support the department's efforts to enhance and embed EDI in its programming, activities, and events. We would be happy to connect the department with the campus's Marketing and Communications team to brainstorm additional ways to better showcase the EDI and reconciliation initiatives that are underway in the department from an outreach perspective.

			Similar events provide us with most valuable feedback from Indigenous colleagues, students and allies to be courageous and open to criticism, as this is the first step towards a sincere reconciliation and collaboration. Such events also helped us form valuable collaborations with other non-Indigenous colleagues to a multitude of (presumably intimidating) tasks together instead of individually. Based on participation of our faculty and staff in such workshops and events, as well as the received feedback, we think that DPES, and the EES group specifically, is on the right track to creating a safer and more inclusive space for our current and future students. Discussion and collaborative work during these workshops showed the high interest of our faculty and staff to get involved with EDI issues and use any opportunity to integrate Indigenous history, knowledge and ways of teaching not only in conventional settings, but also in field-based courses (e.g., history of the people and lands we travel during field camps). Another example is a project that seeks to promote anti-colonial pedagogy at UTSC through an experiential learning opportunity for DPES Graduate students. This work builds upon an established relationship with a community and treaty partner, Giidaakunadaad (Nancy Rowe) at Akinomaagaye Gaamik, on the Mississaugas of the Credit First Nation. Here, our students have an opportunity to engage with Indigenous culture and practice and reflect on their own values, conceptions and responsibilities through an immersive community-based learning experience. The MEnvSc program prepares students for careers as environmental professionals, and many of our graduates will directly engage with Indigenous Knowledge and Indigenous	

			communities in their careers. With this in mind, we are working to foster an understanding of how to equitably engage with diverse knowledge systems and what it means to be an active treaty partner. DPES instructors and the Chair's Office continuously aim at creating a safe, inclusive and equitable environment for everyone. For example, instructors try to make sure that all students know that everyone is welcome in the learning environment and that everyone can participate in experiential learning. This includes subsidizing field trips, helping students maneuver travel grant applications to further lower the costs, or make sure that the field trip logistics are clearly outlined, reviewed, and discussed with the students. These practices allow us to determine the changes that have to be made to be more inclusive or the alternative options that can be offered. Our many field trips in environmental science are key for experiential learning, but access to proper safety gear represents a subtle economic barrier for students, who did not grow up with substantial outdoor experience during their childhood. Many students lack the proper rain gear and steel toed boots to safely participate in field trips. To address this issue, Environmental Science received CTL funding to procure field camp equipment ($12,576). The grant was used to improve the recruitment of students into geosciences by removing barriers (i.e., reducing the cost) for field trip participation. In addition to the departmental efforts to foster inclusion and accessibility in our courses, the University of Toronto Scarborough offers student a multitude of services and funding	

			opportunities; please refer to our self-assessment study.	
	6.	"We recommend that DPES ensure that EDI is prominent in department activities, and with speakers/visitors brought in to interact with the students."	Please see our response to comment #5.	Please see our response to recommendation #5. We would also be happy to connect the department with offices within UTSC, such as the Equity, Diversity, and Inclusion Office and the Office of Indigenous Initiatives to explore recommended practices and plan for ways to execute these effectively.
	7.	"We recognize that increased diversity in the faculty complement is a slow process (particularly in tight financial conditions and in a department where people like their colleagues and don't leave). Nonetheless, creating a more diverse faculty should also be a goal. In the meantime, an approach may be to work with current faculty, staff, and students to embed more EDI in departmental assessment, program design, classroom climate, and other areas. We also encourage working with partners from across UTSC, as well as from community and other universities, where relevant expertise can be brought in."	Please see our response to comment #5.	Please see our response to recommendation #5. We would also be happy to connect the department with offices within UTSC, such as the Equity, Diversity, and Inclusion Office and the Office of Indigenous Initiatives to explore recommended practices and plan for ways to execute these effectively.
The reviewers highlighted a lack of clarity around whether DPES has developed plans to address numerous upcoming leadership and growth changes that will significantly impact them. They emphasized the critical importance of strategic planning and decision making for the unit.	8.	"There are numerous changes ahead for DPES, including a change in Departmental Chair, a new Dean, and the opening of SAMIH. It was not clear that DPES had a strategic and/or succession plan to address these numerous changes that will occur over the next year. There are opportunities for further departmental growth and increased teaching, but strategic decisions are needed."	The department is currently in the phase of recruiting a new Chair. While this change will inevitably involve a learning curve from the new leadership, the department has a clear academic plan, as amply described in the self-assessment study, that ensures its seamless future growth. In regard to the academic changes related to the opening of SAMIH, the department recently modified our former Specialist in Biological Chemistry, now referred to as Medicinal and Biological Chemistry, in order to highlight the existing medicinal chemistry content already in the program, and to further expand on in the	My office will be working closely with the department through the transition to a new Chair, building on the invaluable contributions and stellar leadership that the current Chair has provided to the department for many years. DPES is also actively involved in campus-wide planning that relates to SAMIH programming, recruitment, and space-related needs in the life sciences. My office looks forward to participating in the Chemical Society of Canada's re-accreditation process for the department's suite of Chemistry programs, including the modified and re-titled

			same thematic area through additional course offerings. It is anticipated that this revised program will better align with the interests of our students and campus, and lead to increased growth in the future. As a result of the implemented program changes, which included a program title change, the Chemical Society of Canada (CSC) accreditation for the Biological Chemistry Specialist does not apply to the Medicinal and Biological Chemistry Specialist. We have applied for accreditation of this new program, and we anticipate that it will easily meet the requirements for accreditation next month, when the site visit of the CSC external appraisers will take place. This specialist and its co-op counterpart are crafted as an intensive program that provides students with the breadth and depth needed to explore chemistry and its myriad of applications to medicinal, biological and health-related sciences. The first year of the program provides a solid base in general chemistry, introductory biology and calculus (two courses each), as well as introductory courses in physics and statistics (one each). The second year offers introductory courses in the main subdisciplines of chemistry, along with courses in cell biology. The third year brings in more specialized courses in biochemistry, bio-organic chemistry and medicinal chemistry, while continuing to develop student knowledge of organic, analytical and either physical or inorganic chemistry. The third-year courses lay the foundation for advanced interdisciplinary courses in the fourth year, which showcase applications of biological and medicinal chemistry through contemporary topics. As part of their final year, students are required to complete at least 0.5 credit of directed research under the supervision of a faculty member,	Specialist and Specialist (Co-op) in Medicinal and Biological Chemistry in April 2025.

			culminating in a written thesis and oral presentation by the student. Overall, students need to complete between 14.5 and 15.0 credits to meet the program requirements (depending on student course selection).	
Noting the impending arrival of SAMIH students at UTSC and related enrolment opportunities for DPES, the reviewers recommended accelerated planning for accommodating these learners on campus, with a particular focus on teaching laboratories. They also urged unit and divisional leadership to assess available laboratory spaces, and ensure that these spaces are updated appropriately to meet technical support demands and to accommodate student accessibility needs.	9.	"Given that SAMIH students will be on campus starting Fall 2024, we recommend accelerated planning for how these students will be accommodated, especially with respect to the teaching labs that will be needed."	Thanks to the Dean's support, the department has been granted an additional technician position to support the delivery of our Chemistry labs. However, it is absolutely necessary to get one more technician position given that the incoming cohort of students is expected to increase exponentially the pressure to our personnel. This request will be submitted as part of our new faculty complement plan.	My office and I are continuing to work with the department to address these concerns. We recognize the pressures that the department has been experiencing and will continue to partner with them to address these needs as best we can given the current fiscal climate and related hiring constraints.
	10.	"There are currently safety issues in the chemistry laboratories, such as line of sight for instructors who must be able to observe all students. Furthermore, there are currently some challenges around student preparedness and confidence in laboratory settings. Accessibility for all types of learners is also limited, and the resources for teaching lab technical support is stretched too thinly. The university must make it a top priority to address current [laboratory] limitations and ensure that the fixes will be able to accommodate the technical support demands that will arise with increased student numbers."	This comment from the external reviewers was most welcome. Our self-assessment study allocated more than ten pages to communicate the need for additional investments to our old Chemistry labs (Science Wing). One of the core issues that continues to plague the SW chemistry teaching laboratories since they were last renovated in 2004 are the poor sight lines, making it difficult to adequately communicate instructions, monitor student progress, and quickly identify students who may require extra attention. This is especially important because these labs are used for our A-level undergraduate chemistry laboratory practical sessions. These courses have a large enrollment of students with a wide array of diverse abilities and varying levels of chemistry knowledge and experience from their secondary institutions. Apart from poor sightlines, insufficient lighting is another downfall of the opaque walled fume hoods. Workbenches rely on two fluorescent tube lights to illuminate the space which can burn out causing the need for replacement of the bulb	The accessibility and safety of our labs are paramount to the experiences of students, researchers, and educators. My office and I will advocate for these issues on behalf of the department during discussions with the Office of the Vice-President & Principal and the Office of the Vice-Principal Research and Innovation. In addition, we will consult with the Environmental Health and Safety Office as needed.

			or in some cases the ballast. Fume hoods are also reliant on two working fluorescent tube lights, which without them make the fume hoods unsafe to use. Redesigning and renovating the layout of the space would not only improve the sightlines and illumination of workspace while making the labs safer to enhance the student learning experience, it would also present an opportunity to design the labs such that they can accommodate other disciplines from future growth if required, such as Environmental Sciences. In addition to making the space more flexible, incorporating new technology such as Piab vacuum systems and replacing the Constant Air Volume (CAV) fume hood systems with Variable Air Volume (VAV) systems (similar to those incorporated in the ESCB labs) would make the labs much more energy efficient and environmentally friendly, along with saving the University a significant amount on their energy expenses. Moreover, while the SW teaching labs have recently received a CTL teaching equipment grant to invest in accessible chemistry labware and equipment for students acquiring accommodations, there should also be a larger investment in adjustable height fume hoods and lab benches. Currently, each large lab has one accessible workstation with a hood, which is at a non-adjustable height. Incorporating large screen TVs and accompanying micro-PCs would also help to standardize pre-lab talks amongst TAs and significantly improve the communication of instructions to enhance the facilitation of lab exercises. There are a number of other changes that should be in place, and it is our hope that the upper administration will provide all the resources to necessitate for the department to continue its exciting trajectory.	

	11.	“More attention and investment are needed to ensure that all teaching laboratories, and not just some, are safe and accessible to all learners.”	Please see our response to comments #9 and #10.	Please see our response to recommendation #10.
Other recommendations:	12.	“We did hear from undergraduate students a need for extended library hours and a need for communal meeting spaces.”	This issue has been addressed by changing the designated space for our librarian within the second EV floor of our administration. The greater visibility of the new office space has increased student visitation. Unfortunately, space limitations do not allow for a regular arrangement to accommodate communal meetings. That said, the department has recently allocated space to our graduate students to facilitate the writing of their thesis and manuscripts.	The Sam Ibrahim Building, which opened in Fall 2024, serves as a central hub on the North Campus of UTSC for students to use as study spaces or to simply hang out. In addition, the UTSC Library has undergone extensive renovations that is enabling them to add group study rooms and general study spaces.
	13.	“The department does have an outreach - communications committee, but it understandably seems that fundraising is beyond the scope of an academic unit. Nonetheless, there is potential given the strong growth in the department alumni numbers and the growing importance of sustainability, environmental (especially climate) action, and social justice issues in society. Many universities are choosing to make these topics important components of their fundraising efforts, and the university (and department) might do well with a similar strategy.”	There have been sporadic fundraising efforts with modest success. The department has both the capacity and commitment to work together with the Development and Alumni Relations Office toward similar initiatives in a more systematic manner. We will welcome this prospect.	The Dean’s Office would be pleased to facilitate a connection between the department and the UTSC Development and Alumni Relations Office to discuss advancement and alumni engagement strategies, as well as recommended practices.

UTQAP Cyclical Review: Final Assessment Report and Implementation Plan

1 Review Summary

Program(s) Reviewed:	Applied Climatology Minor (Science) Astronomy and Astrophysics Minor (Science) Biochemistry (HBSc): Major, Major Co-op Biological Chemistry (HBSc): Specialist, Specialist Co-op; Major, Major Co-op Chemistry (HBSc): Specialist, Specialist Co-op; Major, Major Co-op Environmental Chemistry (HBSc): Specialist, Specialist Co-op; Major, Major Co-op Environmental Geoscience (HBSc): Specialist, Specialist Co-op Environmental Physics (HBSc): Specialist, Specialist Co-op Environmental Science (HBSc): Major, Major Co-op; Minor Environmental Studies (BA): Major Global Environmental Change (formerly Environmental Biology), (HBSc): Specialist, Specialist Co-op Natural Sciences and Environmental Management Minor (Science) Physics and Astrophysics (HBSc): Specialist; Major Physical and Mathematical Sciences (HBSc): Specialist Physical Sciences (HBSc): Major Certificate in Sustainability (Category 2) Combined Degree Programs with FASE MEng Combined Degree Programs with MEnvSc Combined Degree Programs with OISE MT Master of Environmental Science (MEnvSc) Environmental Science (PhD) Environmental Science (MSc) (approved to begin in May 2023)
Unit Reviewed:	Department of Physical and Environmental Sciences, University of Toronto Scarborough
Commissioning Officer:	Vice-Principal, Academic & Dean, University of Toronto Scarborough

Reviewers (Name, Affiliation):	• Dr. Simon Bates, Vice-Provost and Associate Vice President, Teaching & Learning, and Professor of Teaching, Department of Physics & Astronomy, University of British Columbia • Dr. Jeffrey McKenzie, Professor, Department of Earth & Planetary Sciences, McGill University • Dr. Jonathan Overpeck, Samuel A. Graham Dean, School for Environment and Sustainability, University of Michigan
Date of Review Visit:	March 27-28, 2024
Review Report Received by VPAP:	June 13, 2024
Administrative Response(s) Received by VPAP:	March 20, 2025
Date Reported to AP&P:	April 10, 2025

Previous UTQAP Review

Date:

Summary of Findings and Recommendations

Significant Program Strengths

- Faculty and staff deliver a first-class undergraduate educational program
- Students obtain experience in industry, with co-op available for students in most programs
- Innovative diversity of degree offerings
- Range of funding opportunities available to students
- Outstanding faculty research
- Strong faculty collaborations within the department and across Canada
- Extraordinarily high morale

Opportunities for Program Enhancement

- Developing a task force to review graduation rates and barriers to completion, as well as increasing outreach and tracking employment outcomes of graduates
- Addressing the writing requirements across all programs
- Addressing student challenges with calculus in introductory courses
- Expanding experiential learning opportunities for students in environmental science and environmental geoscience programs
- Supporting additional opportunities for undergraduate research
- Exploring opportunities for improvements in student advising
- Addressing challenges around staff workloads, equipment and space to provide better support to students and programs
- Exploring ways to enhance engagement between faculty from different disciplines and appointment categories within the department

Current Review: Documentation and Consultation

Documentation Provided to Reviewers

External Review Material: Terms of reference; Self-study and supporting data and appendices; Review report template; Site visit schedule; Previous review report, including the administrative response(s); Access to all undergraduate and graduate course and program descriptions; Access to the curricula vitae of faculty; Curriculum maps for the department's undergraduate and graduate programs.

Supplemental Material from Site Visit Meetings: Presentation deck from the UTSC Arts & Science Co-op Office.

Consultation Process

Decanal group, faculty, students, administrative staff and senior program administrators, as well as members of relevant cognate units, including the UTSC Library, the Office of the Registrar, the Arts & Science Co-op Office, and the Office of the Vice-Principal Research & Innovation.

Current Review: Findings and Recommendations

1. Undergraduate Program(s)

Unless otherwise noted, all bulleted comments apply to all programs reviewed.

The reviewers observed the following **strengths:**

- Overall quality
  - Program quality enhancement processes are in place, and reviewers observe no broad issues of concern
- Objectives
  - Program requirements including program-level learning outcomes are appropriate; and learning expectations and program outcomes are well-linked
- Admissions requirements
  - Admission requirements appear entirely appropriate for the programs offered
  - Environmental Science has very strong enrolment across all of its programs
  - Physics and Astrophysics program demonstrates high entrance requirements for incoming students
- Curriculum and program delivery
  - Delivery modes are appropriate for the programs, with a reasonable mixture of in-person and online teaching
  - Curricula are current and relevant, reflecting trends within the various disciplines across DPES programs
  - Program curricula provide a good range of continuously assessed components, with a clear, cross-cutting focus on writing skills
  - DPES has been responsive to challenges related to changes in high school curricula by adapting their undergraduate course requirements
- Innovation
  - Availability of 'prep courses' for incoming students is noted as an important innovation related to undergraduate admissions
  - Many DPES program and course designs support Universal Design for Learning principals, which can enhance the experience of all learners
- Assessment of learning
  - Assessment methods are varied and balanced
- Student engagement, experience and program support services
  - Impressive breadth and impact of the Co-op programs for undergraduates

    - DPES programs provide numerous experiential learning opportunities for students, including teaching laboratories, field-based projects, and field trips
- Quality indicators – undergraduate students
    - Physics and Astrophysics undergraduate students are academically focused, with strong GPA outcomes

The reviewers identified the following **areas of concern**:

- Student engagement, experience and program support services
    - Challenges noted related to management of the co-op program for the undergraduate programs noted repeatedly during site visit discussions; reviewers note that DPES desires to move this program out of the divisional co-op office and into the department

The reviewers made the following **recommendations**:

- Student engagement, experience and program support services
    - "It is impossible for us, with our short visit to campus, to fully understand the issues and implications of this [potential] change, and to provide a definitive recommendation as to management of the Co-op program. But it is very clear that there is an issue that must be addressed."
    - Reviewers note that it should be a priority for the new Dean to determine appropriate future directions regarding management of the undergraduate co-op program, involving consultation and discussion with UTSC co-op office leadership, DPES representation, and the Dean's office
    - "Ultimately, the goal of the Co-op program for DPES should be to (i) improve the experiential learning for students; (ii) ensure subject matter voices are present in designing and delivering the co-op support for DPES students, and (iii) capitalize on the coherence and economies of a central unit."
    - Consider the potential feasibility of collaboration between DPES and the UTSC co-op office to hire staff who might be embedded in DPES but have clear liaison responsibility to the central co-op office
    - "It is critical that DPES student experience be paramount even if this means more university resources need to be focused on making sure off-campus partners also see their collaborations with the university as a winning venture"

2. Graduate Program(s)

Unless otherwise noted, all bulleted comments apply to all programs reviewed.

The reviewers observed the following **strengths**:

- Overall quality
    - Unit has a thriving research environment for graduate students
    - DPES students comprise half of the graduate students affiliated with the UTSC campus

    - Professional MSc in Environmental Science is a leader in Canada for one year coursework and co-op based environment programs, and is very effective both in teaching and creating a strong learning community
    - Program quality enhancement processes are in place, and reviewers note no broad issues of concern
- Admissions requirements
    - PhD program has had consistent application numbers, and approximately 15 new students enrol each year
    - Admission requirements appear entirely appropriate for the programs offered
    - Environmental Science has very strong enrolment across all of its programs
    - Environmental Studies program has shown a significant increase in enrolment in recent years
- Curriculum and program delivery
    - Professional MSc in Environmental Science has a standard set of courses that prepares students for the workplace by developing professional skills
    - Course sequence pathways that do not impede time to completion for graduate students who do co-op options have been developed, and more work is in progress to improve these pathways
    - Program curricula provide a good range of continuously assessed components, with a clear, cross-cutting focus on writing skills
- Innovation
    - Many DPES program and course designs support Universal Design for Learning principals, which can enhance the experience of all learners
- Accessibility and diversity
    - In the Professional MSc, there are numerous activities to support students from diverse backgrounds
- Assessment of learning
    - Assessment methods are varied and balanced
- Student engagement, experience and program support services
    - Professional MSc offers an online professional skills primer course for incoming students
    - Impressive breadth and impact of the Co-op program for the Professional MSc, with a 100% success rate in finding co-op/internship placements Professional Masters students
    - In addition to standard course requirements, DPES exhibits an excellent focus on preparing PhD students to enter the workforce
    - Department has introduced an innovative new staff position: a Student Learning and Professional Development Coordinator, to implement plans to support the development of work-integrated learning opportunities for doctoral students; reviewers note that this is one of the few programs in the physical sciences addressing the emerging trend of PhD students with post-degree goals outside of academia

    - Professional MSc in Environmental Science co-op program is notable for being managed directly by DPES and not by the UTSC co-op office, and its success is a result of the work of a small number of dedicated staff members
- Quality indicators – graduate students
    - Students are very academically successful, with numerous competitive scholarships from entities such as NSERC, CIHR, OGS, etc.
    - PhD students are highly productive, with publications in a number of journals
- Student funding
    - "There is evidence that the financial support for the PhD program was sufficient"

The reviewers identified the following **areas of concern**:

- Student engagement, experience and program support services
    - Graduate students note some challenges related to interactions with faculty and peers at the St. George campus, which appear to be partly a result of physical distance and the time and resources required to travel between campuses
    - Graduate students express feeling siloed at UTSC, and unable to easily access infrastructure across the three campuses
    - Graduate students express concerns about TA hours, feeling that the actual time they spend far exceeds their budgeted hours
- Student funding
    - Reviewers note they did not receive information regarding financial arrangements for students in the professional MSc program

The reviewers made the following **recommendations**:

- Student engagement, experience and program support services
    - Reviewers recommend "a review of TA activities and if necessary, a calibration of TA hours and workloads so that students only work for the hours they are paid"

3. Faculty/Research

The reviewers observed the following **strengths**:

- Overall quality
    - DPES faculty have excellent broad expertise across their respective fields of study
    - Quality of DPES faculty is very impressive
    - "Given the limited number of faculty relative to the expansive disciplinary nature of DPES, it makes sense that each disciplinary grouping within the department has made strategic choices to focus on specific research areas as their strengths"
- Research
    - Departmental research is exceptionally strong
    - Research strength is a key feature in supporting a thriving graduate education system in DPES

    - DPES has several Fellows of the Royal Society of Canada and holders of Canada Research Chairs; and many faculty receive high-profile national and international awards
    - DPES produces more than 200 peer-reviewed publications annually, and consistently receives more than $2.5 million each year in competitive grant funding
    - Almost all tenure stream faculty hold tri-council grants
- Faculty
    - Faculty are leading numerous initiatives related to EDI, including a teaching grant to support EDI training for graduate students and TAs
    - Teaching stream faculty are leading technological and pedagogical innovations, as well as a number of EDI-centred curriculum initiatives
    - DPES has an excellent balance of tenure and teaching stream faculty, who enjoy strong integration and mutual recognition across the two groups
    - Teaching stream faculty who support the professional MSc program display an impressive breadth of knowledge
    - Reviewers "did not hear any concerns expressed about supervisory loads nor did we observe any associated problems"
    - Teaching stream faculty make important contributions to course design, undergraduate research activities, and pedagogical scholarship within their respective areas
    - Teaching stream publications on Chemistry Education noted as particularly impressive
    - Chemistry program has a very strong complement of tenure and teaching stream faculty with numerous teaching and research awards
    - Impressive Physics faculty group, who put on a full BSc program with a "skeleton" group of 8 faculty members

The reviewers identified the following **areas of concern**:

- Faculty
    - While DPES is a large department, the faculty complement is lean in most subject areas; Physics in particular is noted as the "leanest"
    - Half of the Physics group have been on sabbatical or other leave, with similar absences anticipated the following year; reviewers note concerns about the sustainability of this arrangement
    - Recent opportunities to grow the faculty complement do not appear to have been pursued by the Physics group, "which suggests a degree of internal disharmony"

The reviewers made the following **recommendations**:

- Overall quality
    - "Given that faculty and staff numbers need to increase to support the growing nature of departmental student enrollments, it makes sense that each disciplinary grouping within DPES continues to focus on specific strengths rather than become more diffuse in research excellence"

- Faculty
  - Reviewers recommend that adding to the diversity of the faculty complement should be a departmental goal, though acknowledge that this process can take time

4. Administration

Note: Issues that are addressed through specific University processes and therefore considered out of scope for UTQAP reviews (e.g., individual Human Resources issues, specific health and safety concerns) are routed to proper University offices to be addressed, and are therefore not included in the Review Summary component of the Final Assessment Report and Implementation Plan.

The reviewers observed the following **strengths**:

- Relationships
  - Unit has benefited from a stable period of strong departmental leadership; leadership's contributions to the success of DPES are widely acknowledged
  - Departmental morale appears high; very positive interactions noted across various programs and across student, faculty and staff roles
  - Undergraduate program has very strong connections to local community, with 50% of students coming from the immediate surrounding area
  - Numerous community partnerships are noted to further drive student diversity
  - "In DPES, the cohesive and respectful interactions between research-focused and teaching stream faculty are the norm…DPES should be commended for this positive, collegial environment and esteem of expertise."
  - Faculty appear to enjoy and benefit from participation in a unit with such a broad range of interdisciplinary teaching and research opportunities
  - Department enjoys good relationships with other UTSC units
  - DPES subject librarian is very active in working with faculty and students
  - Department clearly demonstrates strong relationships with local community and organizations
  - DPES has numerous industry and government connections through the Professional MSc program
- Organizational and financial structure
  - DPES's organizational and financial structure is appropriate and effective, with clear processes in place for managing departmental financial activities and supporting research activities
  - Impressive investment in laboratory facilities since the last review
  - The analytical instrumentation facility is impressive and used by researchers and students, including undergraduates
  - Some teaching laboratories are state-of-the-art
  - DPES is located in a fairly new building with excellent spaces and resources
- Long-range planning and overall assessment
  - Department is functioning highly effectively, and in alignment with UTSC and U of T's plans and priorities

- "DPES programs are distinct in their applied and interdisciplinary learning, with many programs augmented with strong experiential components"
- Many DPES programs are in growth mode, and the new Scarborough Academy of Medicine and Integrated Health (SAMIH) may offer further growth potential through teaching opportunities
- Faculty and staff support a highly cohesive and functional grouping of different disciplines, programs and research activities
- Significant progress has been made on responding to recommendations from the previous review
- Department has undergone a major transformation in response to the 2017 review, with a net increase of 18 faculty and staff, and 150 submissions of course/program proposals and revisions
- Department has made significant progress in increasing experiential learning opportunities for students, with "a wealth" of such opportunities now available
- Reviewers note many exciting advances in promoting departmental EDI initiatives
- The Registrar's office has done impressive work in promoting the department's programs to Black and Indigenous students
- Reviewers highlight that DPES maintains accreditation for some Chemistry programs with the Canadian Society for Chemistry; and for the Major programs in Environmental Science and Environmental Studies by the Environmental Careers Organization of Canada
- "[W]e feel that DPES, as a whole, is very strong as an interdisciplinary academic unit; it leads the way on campus for research graduate student enrollment, research outputs are high quality and taught programs are current, interdisciplinary and distinctively experiential. It is the integration of several disciplines that fosters a spirit of interdisciplinary collaboration, particularly for the disciplines co-located within the same building."
- DPES has a dedicated committee to help promote EDI initiatives, and EDI appears to be integrated in some of the unit's curricula

- International comparators
  - "The department is a unique combination of disciplines and interdisciplinary synergy that is clearly thriving under a common departmental home"

The reviewers identified the following **areas of concern**:

- Relationships
  - Relationships with the Campus Co-op office appear strained as a result of differing perspectives regarding where ownership of the DPES undergraduate co-op programs should reside
  - Reviewers wonder if the physical separation of the Physics faculty group from the rest of the DPES unit serves as a barrier to cohesion and relationship building; Physics teaching stream faculty note for example that they rarely have opportunities to collaborate on pedagogy or innovation projects with other instructors
- Organizational and financial structure
  - DPES workloads are high, particularly for support staff

  - Reviewers echo faculty concerns regarding insufficient teaching and administrative staffing; "[this] is a serious issue given overall rising enrollments and future increases due to more activity on the UTSC campus"
  - Reviewers note that there does not appear to be a coherent departmental plan for prioritized staffing requests, due to constraints related to a hiring freeze
  - Some "minor disquiet" noted in the DPES community regarding a move away from the 'Associate Chair (Discipline)' role to disciplinary representatives reporting to the unit head
  - Some teaching laboratories are outdated
  - Some challenges noted regarding student preparedness and confidence in laboratory settings; accessibility for all types of learners is also limited, as are the resources for teaching lab technical support
  - Reviewers note it is unfortunate that the Physics group does not reside in the same building as the rest of DPES; and that such distance may make it difficult for Physics to feel cohesion with the rest of the unit
- Long-range planning and overall assessment
  - Lack of clarity noted around whether DPES has a strategic and/or succession plan to address numerous upcoming changes that will impact them, including a change in Departmental Chair; a new UTM Vice-Principal, Academic and Dean; and the opening of SAMIH
  - Reviewers note that the importance of EDI was addressed in a somewhat limited manner in the DPES self study, and that the unit's diverse student body is eager to see EDI initiatives given greater prominence in the department
- International comparators
  - Reviewers note that comparison of DPES and its programs to similar units at peer institutions is difficult, given the omnibus nature of the department

The reviewers made the following **recommendations**:

- Relationships
  - Reviewers recommend prioritizing the development of a collaborative plan to increase the integration of the Physics group into the broader DPES unit, and address challenges in Physics related to cohesion and capacity; (reviewers note that addressing these issues will likely require an investment of resources, but that increased enrolments and the improved functioning of the Physics program should justify such investments)
- Organizational and financial structure
  - "More attention and investment are needed to ensure that all teaching laboratories, and not just some, are safe and accessible to all learners"
  - Undergraduate students note a desire for extended library hours and communal meeting spaces
  - "We learned that the university will be moving to responsibility-based financial management, and hope that implementation of this strategy will result in increased flows of resources to DPES commensurate with the growing enrollments and success of the department"

  - While fundraising is not currently a significant component of DPES activities, reviewers note some potential for development in this area (at the institutional, divisional and/or departmental level), given the strong growth of DPES alumni numbers, and the growing societal importance of sustainability, environmental action, and social justice issues
- Long-range planning and overall assessment
  - Prospects for the unit's future are bright, "particularly if [the] university increases funding to match the on-going growth in departmental stature, student numbers and overall impact"
  - "There are opportunities for further departmental growth and increased teaching, but strategic decisions are needed."
  - "[G]iven the growing societal need for sustainability, environmental solutions, climate action, and socially just solutions, DPES offers the university a way to become more prominent both nationally and internationally. The university must invest more in DPES in order to fully seize this opportunity."
  - Noting enrolment opportunities for DPES related to the opening of SAMIH, the reviewers recommend accelerated planning for how SAMIH students will be accommodated on campus, especially in teaching labs
  - …"The university must make it a top priority to address current limitations [in particular related to teaching laboratories] and ensure that the fixes will be able to accommodate the technical support demands that will arise with increased student numbers."
  - Reviewers recommend that DPES ensure that EDI is made more prominent in departmental activities, noting that students would be useful and enthusiastic partners in planning and implementing related endeavours
  - Consider working with faculty, staff and students to embed more EDI into departmental program design, assessment, classroom climate and other areas; consider also engaging with partners from across UTSC and beyond, who may have relevant expertise

UNIVERSITY OF TORONTO SCARBOROUGH

Office of the Vice-Principal Academic and Dean

March 20, 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: External Review of the Department of Physical and Environmental Sciences, University of Toronto Scarborough

Dear Professor Rule,

Thank you for your letter of December 9, 2024, requesting my administrative response to the March 2024 external review of the Department of Physical and Environmental Sciences. I want to extend my gratitude to the review team—Simon Bates, Vice-Provost and Associate Vice-President, Teaching & Learning, and Professor of Teaching, Department of Physics & Astronomy, University of British Columbia; Jeffrey McKenzie, Professor, Department of Earth & Planetary Sciences, McGill University; and Jonathan Overpeck, Samuel A. Graham Dean, School for Environment and Sustainability, University of Michigan—for their consultation with the Department during the site visit from March 27-28, 2024, and for their Report, which was finalized on June 13, 2024, and shared with the Department.

We deeply appreciate the reviewers' commendation of the Department's curricula in relation to current disciplinary trends, as well as the Department's extensive experiential learning and co-op offerings for undergraduate students. In addition to praising the flourishing research environment created by the Department for its graduate students and for preparing PhD students to pursue different pathways, the reviewers recognized the technological and pedagogical innovations led by the Department's faculty members, noting the transformative progress undertaken by the Department since its last review.

The report from the review team identifies several areas for enhancement and development, including determining appropriate future directions for optimal stewardship of the undergraduate co-op program; exploring options to ensure the Department's graduate student population is appropriately supported; encouraging greater collaboration and community among all faculty members of the Department; making Equity, Diversity, and Inclusion (EDI) more prominent in departmental activities; engaging in strategic planning to address future leadership and growth changes; and assessing available laboratory spaces in relation to technical support demands and student accessibility needs. With this letter, I have included a table summarizing the responses to the specific recommendations of the reviewers and anticipated timelines for implementation, where appropriate.

Once again, I thank the review team for their insightful and valuable review of the Department and its programs. I look forward to supporting the Department in implementing the recommendations of this report. The Dean's Office will monitor the implementation of recommendations through ongoing meetings with the Chair of the Department of Physical and Environmental Sciences. An interim report to the Office of the Vice-Provost, Academic Programs will be prepared in **Fall 2028**. The next external review of the Department will take place **no later than the 2031-32 academic year**.

Sincerely,

Professor Karin Ruhlandt
Vice-Principal Academic & Dean

Arts & Administration Building, 1265 Military Trail, Toronto, ON, M1C 1A4 Canada
Tel: +1 416 287 7027 · www.utsc.utoronto.ca

2023-24 UTQAP Review of the UTSC Department of Physical and Environmental Sciences - Review Recommendations

Please do the following for each recommendation in the table:

- If you **intend** to act on a recommendation, please provide an **Implementation Plan** identifying actions to be taken, the time frame (short, medium, long term) for each, and who will take the lead in each area. If appropriate, please identify any necessary changes in organization, policy or governance; and any resources, financial and otherwise, that will be provided, and who will provide them.
- If you **do not** intend to act on a recommendation, please briefly explain why the actions recommended have not been prioritized.
- In accordance with the UTQAP and Ontario's Quality Assurance Framework, "it is important to note that, while the external reviewers' report may include **commentary** on issues such as faculty complement and/or space requirements when related to the quality of the program under review, **recommendations** on these or any other elements that are within the purview of the university's internal budgetary decision-making processes must be tied directly to issues of program quality or sustainability" (emphasis added)
- You may wish to refer to the sample table provided by the Office of the Vice-Provost, Academic Programs

Request Prompt *verbatim from the request*	**Rec. #**	**Recommendations from Review Report** *verbatim from the review report*	**Unit Response**	**Dean's Response**
The reviewers highlighted significant challenges and differences of opinion related to management of the undergraduate co-op program. They recommended that UTSC leadership engage in consultations with all stakeholders to determine appropriate future directions for optimal stewardship of the program.	1.	"[The management of the undergraduate co-op program] should be a priority for the new Dean. There should be a series of focused conversations around addressing the breakdown of trust and cooperation, involving Co-op office leadership, departmental representation, and the Dean's office, with a decision on the way forward (even if as a 1-2 year pilot) by Fall 2024. Ultimately, the goal of the Co-op program for DPES should be to (i) improve the experiential learning for students; (ii) ensure subject matter voices are present in designing and delivering the co-op support for DPES students, and (iii) capitalize on the coherence and economies of a central unit."	This is an issue that was raised extensively in our self-assessment report. We are delighted that the external reviewers emphasized the need to rectify the multitude of issues that make the performance of our co-op programs far from satisfactory. Moving forward, the next major aspiration of the department is to take full control of our co-op programs; especially in Environmental Sciences (EES). Counter to the significant growth of our EES (Major, Minors, and Specialist) programs over the past 6-7 years, the enrollment trends in their co-op counterparts have been disturbingly stagnant with no discernible signs of improvement (i.e., collectively less than 50 EES co-op students). While the Arts & Science Co-op Office has recently embarked on a promising exercise that aims to address some of the long-standing dysfunctionalities of the programs, such as the development of proper course sequencing that will increase the number of summer offerings, we have fundamentally different perspectives regarding the framework that should be in place	Co-op is a historic strength of UTSC, and the Dean's Office is committed to the success of these programs. As an initial step toward addressing the concerns identified by reviewers and the department, the Arts & Science Co-Op Office has hired a dedicated liaison to support programming in the sciences. We have also completed a review of all required course pathways for students in the department's co-op programs and committed funding to better facilitate regular timetabling; this has been an ongoing barrier to program completion. We are in the early stages of this new structure and will need to assess its success. We acknowledge that the department has a different perspective on supporting the professional development of students, particularly at the undergraduate level. With that in mind, I am committed to engaging in strategic discussions with academic leaders and with the Arts & Science Co-Op office to ensure that appropriate supports are in place for the long-term success of co-op and experiential learning

			to ensure a rich professional development for our students. The astonishing record of our MEnvSci internship team -100% internship placements annually, and more than 70% extensions of their internships and/or full-time employment offers- sets an "academic model" that we aspire to implement to our co-op programs. These tangible deliverables are the result of an academically rigorous curriculum, rich in experiential-learning opportunities, and tightly linked with the workforce (industry, government, non-profit organizations). From a departmental perspective, having our undergraduate co-op programs under our supervision will establish the department as the focal academic unit within the UofT system that offers comprehensive education and promising career prospects in Environmental Sciences. A fully functional undergraduate EES co-op, combined with our Professional MEnvSci program and the proposed Work Integrated Learning pathway in our PhD program will allow us to establish the Department of Physical and Environmental Sciences as an academic unit that offers clear linkages with the workforce for BSc, MSc, and PhD students! It is our hope that this change in the administration of our co-op program, endowed with the appropriate human and financial resources, will be in the foreseeable future. As a first step, our plans involve the EES undergraduate co-op, but we do intend to request full administrative oversight of the CHM programs within the next 2-3 years.	not only in the department but across the campus as a whole. At this stage, we are interested in taking a coordinated approach that supports and connects needs across the campus rather than implementing department-specific offices. We are considering the possibility of an external review of co-op at UTSC as a part of the assessment of next steps.
The reviewers raised concerns that graduate students in DPES feel isolated from the St. George campus,	2.	"In our meeting with graduate students two issues of concern were discussed. First, the graduate students found interactions with faculty	The vast majority of these concerns have been raised by students, who are affiliated with tri-campus graduate programs of cognate academic	Almost half of UTSC graduate students are "affiliated" and belong to tri-campus graduate units that are largely based downtown. The Vice-

encounter difficulties accessing tri-campus resources and infrastructure, and report that their TA responsibilities often require more time than is budgeted. They recommended exploring approaches to ensure that the unit's graduate student population is appropriately supported.		and peers at the St. George campus to be challenging. Part of the issue was physical distance, and the time/resources required to visit the other campus. Further, the students felt siloed at UTSC, and not easily able to access infrastructure across the tri-campus. Second, the graduate students expressed concerns about TA hours, and felt that their actual time spent undertaking TA hours far exceeded their budgeted hours. We would recommend a review of TA activities and if necessary, a calibration of TA hours and workloads so that students only work for the hours they are paid."	units primarily located at the St. George campus. DPES has already reached out to the departments of Chemistry and Physics. Starting from next year, we will play a more active role with the delivery of the seminar series of their units and they will do the same for ours. There will be more opportunities for cross-fertilization through nomination of speakers, as well as live streaming of all the talks. That said, the department is very open to instigate more initiatives that will bring the three campuses of the University of Toronto system closer, assuming that the required resources are available. As far as the TA activities are concerned, the department has recently completed a comprehensive review of our TA assignments and we are happy to report two major advancements: (i) Courses that needed extra support have -on average- received a 10% increase in the allocated TA hours. (ii) The tasks assigned to TAs have been revisited to ensure optimal use of the existing resources for several courses. We have not received any complaints by any of our graduate students so far. We are committed to closely monitor this issue and rectify any problems that may be raised in the future.	Dean Graduate & Postdoctoral Studies at UTSC regularly holds events and workshops to foster a unique graduate community on campus. The Graduate Chair from Chemistry tries to regularly meet with UTSC graduate students in person and we will encourage leaders from other graduate units to do the same. The Dean's Office appreciates the department's collaborations with other cognate units at the St. George campus to bring graduate students from that campus and UTSC together for various initiatives. We also support the department's efforts to review and optimize the allocation of tasks and hours for TA activities across different courses. We look forward to engaging in further discussion with the department about how these processes will connect to the campus-wide implementation of the planned new budget model to ensure appropriate supports.
The reviewers recommended that the unit engage in a strategic faculty complement planning process; and that they prioritize ensuring appropriate coverage in Physics and adding to the diversity of the faculty complement when hiring opportunities permit. They also highlighted opportunities to strengthen the integration of the Physics faculty group with the rest of the unit, and to	3.	"We learned that 4 out of the 8 Physics faculty (tenure track plus teaching) were on sabbatical and leave this year (with the same or similar numbers next year). It is hard to see how this is sustainable, let alone how it can support growth in student numbers (e.g., associated with the SAMIH). Conversely, we also learned that opportunities to grow the faculty complement were not taken up by Physics faculty which suggests a degree of internal disharmony. We wonder if the physical separation from the rest of the DPES department is a barrier. For example,	The approval of all the sabbatical/study leaves during the academic year 2022-2023 was an executive decision made by the leadership of the department, in order to accommodate a multitude of health/mental issues raised by our faculty members after 2.5 years of the pandemic. It was a one-time-only decision to support our academic personnel and allow them to recover from the toll of these extraordinary times. The physical separation of the physics group from the rest of the department is certainly an issue….and an unfortunate decision that was made in 2014	Recognizing the long after-effects of the COVID-19 pandemic and the challenges to collegiality within our community due to global geopolitical uncertainties, the Office of the Vice-Dean Faculty Affairs, Equity, and Success (OVDFAES) has designated 2024-25 as the Year Towards Restoration, with new initiatives organized aiming to transform the institutional culture of UTSC into a more restorative one. We are pleased also to note that three faculty members from the Department of Physical and Environmental Sciences are part of this year's

encourage greater collaboration and community among all DPES faculty.		the teaching stream faculty in Physics, in contrast to the other DPES Teaching Stream faculty, said they rarely had the opportunity to collaborate on pedagogy or innovation projects with other instructors. Lab technical support is also an issue that needs to be addressed. We recommend making it a priority (e.g., because of likely near-term demand growth due to the SAMIH) to develop a collaborative plan that addresses the challenges noted above in a pragmatic and sustainable manner. This plan will undoubtedly require more investment of resources, but increased enrollments should justify this investment, as will the fact that a more well-functioning and integrated Physics program should serve to increase the stature of DPES and the university.”	during the construction of the ESC building. We are hopeful that the ongoing development in our campus will offer an opportunity for space re-allocation that will make it feasible for the physics group to come closer to the rest of the department. Of equal importance is our proposal for a major renovation of our A-level physics labs (please refer to our self-assessment study). The proposed changes will not only enrich the learning experience of our students but will also allow us to accommodate the enrollment increase from the establishment of SAMIH. Last but not least, there is a plan for a new faculty position in the area of environmental physics that will not only allow to support our dynamic specialist program but will also bring (intellectually) closer the disciplines of Environmental Sciences and Physics. Once the current hiring freeze is removed, this position will be one of our strategic priorities.	Mentoring Excellence and Diversity Advisory Committee (MEAD), which advises on and provides resources for the professional development of faculty and librarians. In addition, DPES faculty are active members of two OVDFAES-funded Mentorship Partnerships focused on (1) sensory, affective, imaginative and land-based (SAIL) pedagogy and (2) sharing Indigenous knowledge and learnings. Mentorship Partnerships aim to foster community and learning among faculty and librarians. DPES participation affirms faculty need for such opportunities; and DPES leadership has been integral to their success. Several capital projects are currently underway at the University of Toronto Scarborough, including the construction of the Myron and Berna Garron Health Sciences Complex (SAMIH) and the development of Phase 2 of the Environmental and Related Technologies Hub. My office and I look forward to advocating spacing (re-)allocation needs on behalf of the department when engaging in discussions with the Office of the Vice-President & Principal and the Office of the Vice-Principal Research and Innovation as these projects continue and near completion. My office and I appreciate the department’s desire for renovated physics lab spaces to enhance the student experience and the identification of environmental physics as a potential area for future hiring. In the current budget environment, my office is actively working to align future hiring and capital projects with campus strategic priorities, while being mindful of the Physics group’s current needs within the department.

	4.	"We recognize that increased diversity in the faculty complement is a slow process (particularly in tight financial conditions and in a department where people like their colleagues and don't leave). Nonetheless, creating a more diverse faculty should also be a goal."	As noted during the site visit of the external reviewers, the department has made remarkable progress in achieving a gender-balanced faculty membership over the past ten (10) years; especially if we consider that we are a STEM department. The department has also been actively involved with academic initiatives targeting a multitude of equity-deserving groups, e.g., Environmental Anthropology. We are intensely committed to continue with these initiatives for years to come.	UTSC is committed to equity, diversity, and inclusion in its goal of inspiring inclusive excellence. This commitment is reflected in our faculty hiring practices and our success in welcoming Black and Indigenous colleagues to UTSC through the UTSC Pathway to Parity program (supported by funding from the University Provost), a concerted effort to increase the number of Black and Indigenous faculty to reflect the community and student populations we serve. DPES is a valued partner in this work, having launched one (ultimately unsuccessful) recruitment effort in recent years and leading a Pathway hire in 2024-25. The current Pathway search is in Environmental Studies and attracted a gender and racially diverse pool of applicants, boding well for future hiring efforts. We look forward to continuing to collaborate with the department on ongoing planning toward the further diversification of faculty and related structural changes that support inclusive excellence across the campus. Currently, three of the 17 members (including 2 Co-Chairs) of UTSC's Mentoring Excellence and Diversity Advisory Committee (MEAD) are faculty members from the Department of Physical and Environmental Sciences. Notably, all three of these faculty members are women, and one is a person of colour. MEAD advises on and provides resources for the professional development of faculty and librarians.
The reviewers noted limited coverage of Equity, Diversity and Inclusion activities in the unit's self-study document. They broadly recommended that DPES take steps to ensure that EDI is made more prominent in departmental activities,	5.	"…the students that we met with were diverse and keen to see greater prominence of EDI initiatives (e.g., equity and inclusion oriented, including the teaching of knowledge from more diverse sources and perspectives); they would be useful and enthusiastic partners in planning and implementing such endeavours."	DPES has a dedicated and extremely active committee to deal with Equity, Diversity and Inclusion (EDI) issues, and its mandate is completely aligned with the UTSC mission. The purpose has been to promote initiatives that remove barriers to access opportunities/resources for faculty, staff, and	The department has been actively involved in the campus-wide curriculum review, which since 2020 has been working to reflect equity, accessibility, anti-racism, anti-colonialism, and Indigeneity in curriculum and pedagogy, as well as student mental health and well-being. We have included in our formal communications

and that they engage with students in pursuing such endeavors.			students and inspire intellectual growth over the entire EDI spectrum. Most of these initiatives are planned and discussed within the EDI team and are communicated by the Chair's office. Faculty who are involved in campus-wide initiatives, such as campus EDI committee, microaggression in the classroom, EDI in Teaching etc. share insights with the team and work towards departmental EDI goals. The Dean's office and DPES have dedicated funding for faculty to work and implement EDI principles in our program and course delivery. One such example is the Pedagogies of Inclusive Excellence (PIE) fund that is available for DPES faculty to incorporate inclusive pedagogies, including Indigenous content in our curriculum. We are extremely proud to report that DPES has achieved an impressive success rate with the PIE fund, and the successful proposals include learning opportunities conducive to the EDI principles across a multitude of A-,B-C-, and D-level courses. DPES faculty, staff, and students are also increasingly engaged with the Indigenous history and knowledge of the Peoples that populated the land we live on today. A recent event that was sponsored by a PIE fund initiative was held at DPES (e.g., workshops with Indigenous collaborators and colleagues) on June 27, 2023: Walking Together - Implementing Indigenous pedagogies in Environmental Sciences. During this workshop, the participants discussed how to include in the course material, Indigenous teaching and the history of racism and colonialism, highlighted the fear of faculty in getting it wrong and offering inadequate content.	(including the UTSC Campus Curriculum Review Working Circle's Resource Hub) to academic units examples of resources to consult as they incorporate different elements of EDI in their development of curriculum, and we will continue to partner with the department in the implementation and deepening of this work. UTSC has dedicated educational developers to assist the department in developing curriculum that centres universal design for learning and anti-racist pedagogies. In addition, the UTSC's Mentoring Excellence and Diversity Advisory Committee (MEAD) advises on and provides resources for the professional development of faculty and librarians. My office is committed to continuing to support the department's efforts to enhance and embed EDI in its programming, activities, and events. We would be happy to connect the department with the campus's Marketing and Communications team to brainstorm additional ways to better showcase the EDI and reconciliation initiatives that are underway in the department from an outreach perspective.

			Similar events provide us with most valuable feedback from Indigenous colleagues, students and allies to be courageous and open to criticism, as this is the first step towards a sincere reconciliation and collaboration. Such events also helped us form valuable collaborations with other non-Indigenous colleagues to a multitude of (presumably intimidating) tasks together instead of individually. Based on participation of our faculty and staff in such workshops and events, as well as the received feedback, we think that DPES, and the EES group specifically, is on the right track to creating a safer and more inclusive space for our current and future students. Discussion and collaborative work during these workshops showed the high interest of our faculty and staff to get involved with EDI issues and use any opportunity to integrate Indigenous history, knowledge and ways of teaching not only in conventional settings, but also in field-based courses (e.g., history of the people and lands we travel during field camps). Another example is a project that seeks to promote anti-colonial pedagogy at UTSC through an experiential learning opportunity for DPES Graduate students. This work builds upon an established relationship with a community and treaty partner, Giidaakunadaad (Nancy Rowe) at Akinomaagaye Gaamik, on the Mississaugas of the Credit First Nation. Here, our students have an opportunity to engage with Indigenous culture and practice and reflect on their own values, conceptions and responsibilities through an immersive community-based learning experience. The MEnvSc program prepares students for careers as environmental professionals, and many of our graduates will directly engage with Indigenous Knowledge and Indigenous	

			communities in their careers. With this in mind, we are working to foster an understanding of how to equitably engage with diverse knowledge systems and what it means to be an active treaty partner. DPES instructors and the Chair's Office continuously aim at creating a safe, inclusive and equitable environment for everyone. For example, instructors try to make sure that all students know that everyone is welcome in the learning environment and that everyone can participate in experiential learning. This includes subsidizing field trips, helping students maneuver travel grant applications to further lower the costs, or make sure that the field trip logistics are clearly outlined, reviewed, and discussed with the students. These practices allow us to determine the changes that have to be made to be more inclusive or the alternative options that can be offered. Our many field trips in environmental science are key for experiential learning, but access to proper safety gear represents a subtle economic barrier for students, who did not grow up with substantial outdoor experience during their childhood. Many students lack the proper rain gear and steel toed boots to safely participate in field trips. To address this issue, Environmental Science received CTL funding to procure field camp equipment ($12,576). The grant was used to improve the recruitment of students into geosciences by removing barriers (i.e., reducing the cost) for field trip participation. In addition to the departmental efforts to foster inclusion and accessibility in our courses, the University of Toronto Scarborough offers student a multitude of services and funding	

			opportunities; please refer to our self-assessment study.	
	6.	"We recommend that DPES ensure that EDI is prominent in department activities, and with speakers/visitors brought in to interact with the students."	Please see our response to comment #5.	Please see our response to recommendation #5. We would also be happy to connect the department with offices within UTSC, such as the Equity, Diversity, and Inclusion Office and the Office of Indigenous Initiatives to explore recommended practices and plan for ways to execute these effectively.
	7.	"We recognize that increased diversity in the faculty complement is a slow process (particularly in tight financial conditions and in a department where people like their colleagues and don't leave). Nonetheless, creating a more diverse faculty should also be a goal. In the meantime, an approach may be to work with current faculty, staff, and students to embed more EDI in departmental assessment, program design, classroom climate, and other areas. We also encourage working with partners from across UTSC, as well as from community and other universities, where relevant expertise can be brought in."	Please see our response to comment #5.	Please see our response to recommendation #5. We would also be happy to connect the department with offices within UTSC, such as the Equity, Diversity, and Inclusion Office and the Office of Indigenous Initiatives to explore recommended practices and plan for ways to execute these effectively.
The reviewers highlighted a lack of clarity around whether DPES has developed plans to address numerous upcoming leadership and growth changes that will significantly impact them. They emphasized the critical importance of strategic planning and decision making for the unit.	8.	"There are numerous changes ahead for DPES, including a change in Departmental Chair, a new Dean, and the opening of SAMIH. It was not clear that DPES had a strategic and/or succession plan to address these numerous changes that will occur over the next year. There are opportunities for further departmental growth and increased teaching, but strategic decisions are needed."	The department is currently in the phase of recruiting a new Chair. While this change will inevitably involve a learning curve from the new leadership, the department has a clear academic plan, as amply described in the self-assessment study, that ensures its seamless future growth. In regard to the academic changes related to the opening of SAMIH, the department recently modified our former Specialist in Biological Chemistry, now referred to as Medicinal and Biological Chemistry, in order to highlight the existing medicinal chemistry content already in the program, and to further expand on in the	My office will be working closely with the department through the transition to a new Chair, building on the invaluable contributions and stellar leadership that the current Chair has provided to the department for many years. DPES is also actively involved in campus-wide planning that relates to SAMIH programming, recruitment, and space-related needs in the life sciences. My office looks forward to participating in the Chemical Society of Canada's re-accreditation process for the department's suite of Chemistry programs, including the modified and re-titled

			same thematic area through additional course offerings. It is anticipated that this revised program will better align with the interests of our students and campus, and lead to increased growth in the future. As a result of the implemented program changes, which included a program title change, the Chemical Society of Canada (CSC) accreditation for the Biological Chemistry Specialist does not apply to the Medicinal and Biological Chemistry Specialist. We have applied for accreditation of this new program, and we anticipate that it will easily meet the requirements for accreditation next month, when the site visit of the CSC external appraisers will take place. This specialist and its co-op counterpart are crafted as an intensive program that provides students with the breadth and depth needed to explore chemistry and its myriad of applications to medicinal, biological and health-related sciences. The first year of the program provides a solid base in general chemistry, introductory biology and calculus (two courses each), as well as introductory courses in physics and statistics (one each). The second year offers introductory courses in the main subdisciplines of chemistry, along with courses in cell biology. The third year brings in more specialized courses in biochemistry, bio-organic chemistry and medicinal chemistry, while continuing to develop student knowledge of organic, analytical and either physical or inorganic chemistry. The third-year courses lay the foundation for advanced interdisciplinary courses in the fourth year, which showcase applications of biological and medicinal chemistry through contemporary topics. As part of their final year, students are required to complete at least 0.5 credit of directed research under the supervision of a faculty member,	Specialist and Specialist (Co-op) in Medicinal and Biological Chemistry in April 2025.

			culminating in a written thesis and oral presentation by the student. Overall, students need to complete between 14.5 and 15.0 credits to meet the program requirements (depending on student course selection).	
Noting the impending arrival of SAMIH students at UTSC and related enrolment opportunities for DPES, the reviewers recommended accelerated planning for accommodating these learners on campus, with a particular focus on teaching laboratories. They also urged unit and divisional leadership to assess available laboratory spaces, and ensure that these spaces are updated appropriately to meet technical support demands and to accommodate student accessibility needs.	9.	"Given that SAMIH students will be on campus starting Fall 2024, we recommend accelerated planning for how these students will be accommodated, especially with respect to the teaching labs that will be needed."	Thanks to the Dean's support, the department has been granted an additional technician position to support the delivery of our Chemistry labs. However, it is absolutely necessary to get one more technician position given that the incoming cohort of students is expected to increase exponentially the pressure to our personnel. This request will be submitted as part of our new faculty complement plan.	My office and I are continuing to work with the department to address these concerns. We recognize the pressures that the department has been experiencing and will continue to partner with them to address these needs as best we can given the current fiscal climate and related hiring constraints.
	10.	"There are currently safety issues in the chemistry laboratories, such as line of sight for instructors who must be able to observe all students. Furthermore, there are currently some challenges around student preparedness and confidence in laboratory settings. Accessibility for all types of learners is also limited, and the resources for teaching lab technical support is stretched too thinly. The university must make it a top priority to address current [laboratory] limitations and ensure that the fixes will be able to accommodate the technical support demands that will arise with increased student numbers."	This comment from the external reviewers was most welcome. Our self-assessment study allocated more than ten pages to communicate the need for additional investments to our old Chemistry labs (Science Wing). One of the core issues that continues to plague the SW chemistry teaching laboratories since they were last renovated in 2004 are the poor sight lines, making it difficult to adequately communicate instructions, monitor student progress, and quickly identify students who may require extra attention. This is especially important because these labs are used for our A-level undergraduate chemistry laboratory practical sessions. These courses have a large enrollment of students with a wide array of diverse abilities and varying levels of chemistry knowledge and experience from their secondary institutions. Apart from poor sightlines, insufficient lighting is another downfall of the opaque walled fume hoods. Workbenches rely on two fluorescent tube lights to illuminate the space which can burn out causing the need for replacement of the bulb	The accessibility and safety of our labs are paramount to the experiences of students, researchers, and educators. My office and I will advocate for these issues on behalf of the department during discussions with the Office of the Vice-President & Principal and the Office of the Vice-Principal Research and Innovation. In addition, we will consult with the Environmental Health and Safety Office as needed.

			or in some cases the ballast. Fume hoods are also reliant on two working fluorescent tube lights, which without them make the fume hoods unsafe to use. Redesigning and renovating the layout of the space would not only improve the sightlines and illumination of workspace while making the labs safer to enhance the student learning experience, it would also present an opportunity to design the labs such that they can accommodate other disciplines from future growth if required, such as Environmental Sciences. In addition to making the space more flexible, incorporating new technology such as Piab vacuum systems and replacing the Constant Air Volume (CAV) fume hood systems with Variable Air Volume (VAV) systems (similar to those incorporated in the ESCB labs) would make the labs much more energy efficient and environmentally friendly, along with saving the University a significant amount on their energy expenses. Moreover, while the SW teaching labs have recently received a CTL teaching equipment grant to invest in accessible chemistry labware and equipment for students acquiring accommodations, there should also be a larger investment in adjustable height fume hoods and lab benches. Currently, each large lab has one accessible workstation with a hood, which is at a non-adjustable height. Incorporating large screen TVs and accompanying micro-PCs would also help to standardize pre-lab talks amongst TAs and significantly improve the communication of instructions to enhance the facilitation of lab exercises. There are a number of other changes that should be in place, and it is our hope that the upper administration will provide all the resources to necessitate for the department to continue its exciting trajectory.	

	11.	"More attention and investment are needed to ensure that all teaching laboratories, and not just some, are safe and accessible to all learners."	Please see our response to comments #9 and #10.	Please see our response to recommendation #10.
Other recommendations:	12.	"We did hear from undergraduate students a need for extended library hours and a need for communal meeting spaces."	This issue has been addressed by changing the designated space for our librarian within the second EV floor of our administration. The greater visibility of the new office space has increased student visitation. Unfortunately, space limitations do not allow for a regular arrangement to accommodate communal meetings. That said, the department has recently allocated space to our graduate students to facilitate the writing of their thesis and manuscripts.	The Sam Ibrahim Building, which opened in Fall 2024, serves as a central hub on the North Campus of UTSC for students to use as study spaces or to simply hang out. In addition, the UTSC Library has undergone extensive renovations that is enabling them to add group study rooms and general study spaces.
	13.	"The department does have an outreach - communications committee, but it understandably seems that fundraising is beyond the scope of an academic unit. Nonetheless, there is potential given the strong growth in the department alumni numbers and the growing importance of sustainability, environmental (especially climate) action, and social justice issues in society. Many universities are choosing to make these topics important components of their fundraising efforts, and the university (and department) might do well with a similar strategy."	There have been sporadic fundraising efforts with modest success. The department has both the capacity and commitment to work together with the Development and Alumni Relations Office toward similar initiatives in a more systematic manner. We will welcome this prospect.	The Dean's Office would be pleased to facilitate a connection between the department and the UTSC Development and Alumni Relations Office to discuss advancement and alumni engagement strategies, as well as recommended practices.

3 Committee on Academic Policy & Programs (AP&P) Findings

The spokesperson for the reading group reported that the review summary accurately described the full review, and the Dean's administrative response adequately addressed all issues identified. The Reading Group reported that the review highlighted high morale, strong research, breadth of program, strong co-op and experiential learning opportunities, interdisciplinary collaboration and clear progress since last review. The Reading Group asked the Unit to further comment on the strong opposing views on the management of the co-op program.

Katie Larson, Vice-Dean, Teaching, Learning & Undergraduate Programs, responded that the co-op and experiential learning programs were core commitments, a strength and priority of the campus. The Arts & Science co-op office administered the co-op program in a centralized format, working with various departments to support those programs. The Department of Physical & Environmental Sciences ("DPES") had been advocating for a department focused model, whereas the Dean's office wanted to explore a centralized model. Steps were taken in the interim to address the departmental concerns that were highlighted in the review. There were dedicated staff that served as direct department liaisons and they were in the early stages of assessing progress, acknowledging the core differences in opinion. Professor Larson noted that this was an ongoing discussion, and that there was a planned external review of the Arts & Science co-op program at UTSC, to gain proper insight on how best to move forward, since this concern was connected to experiential learning more broadly on campus.

No follow-up report was requested.

4 Institutional Executive Summary

The reviewers praised DPES for offering up-to-date undergraduate curricula that align with current disciplinary trends. Notably, the reviewers commended the Department's extensive experiential learning opportunities and robust co-op programs. They congratulated DPES on its thriving research environment for graduate students with an excellent focus on preparing PhD students to enter the workforce – in academia and beyond. They highlighted the impressive quality of DPES faculty and exceptionally strong departmental research; and noted that teaching stream faculty are leading technological and pedagogical innovations. Finally, the reviewers highlighted that DPES has made transformative progress since their last review, resulting in a net increase of faculty and staff; the Department benefits from stable leadership and strong morale; and the unit is housed in a modern building with excellent facilities.

The reviewers recommended that the following issues be addressed: engaging in consultations with all stakeholders to determine appropriate future directions for optimal stewardship of the undergraduate co-op program; exploring approaches to ensure that the unit's graduate student population is appropriately supported; engaging in a strategic faculty complement planning process, and prioritizing coverage in Physics and adding to the diversity of the faculty

complement when hiring opportunities permit; taking steps to ensure that EDI is made more prominent in departmental activities; engaging in strategic planning and decision making related to numerous upcoming leadership and growth changes; and conducting accelerated planning to accommodate the arrival of SAMIH students at UTSC, with a particular focus on teaching laboratories, as well as more broadly ensuring that laboratory spaces are updated appropriately to meet technical support demands and student accessibility needs.

The Dean's Administrative Response describes the Faculty and unit's responses to the reviewers' recommendations, including an implementation plan for any changes necessary as a result.

5 Monitoring and Date of Next Review

The Dean's Office will monitor the implementation of recommendations through ongoing meetings with the Chair of the Department of Physical and Environmental Sciences.

The Dean will provide an interim report to the Vice-Provost, Academic Programs in 2028 on the status of the implementation plans.

The next review will take place no later than the 2031-32 academic year.

6 Distribution

On August 15th 2025, the Final Assessment Report and Implementation Plan was posted to the Vice-Provost, Academic Programs website and the link provided by email to the Vice-Principal, Academic & Dean of UTSC, the Secretaries of AP&P, Academic Board and Governing Council, and the Ontario Universities Council on Quality Assurance. The Dean provided the link to unit/program leadership.