Carleton UNIVERSITY
Canada's Capital University

Office of the Vice-Provost and Associate Vice-President (Academic)

memorandum

DATE: October 15, 2021

TO: Senate

FROM: Dr. Dwight Deugo, Vice-Provost and Associate Vice-President (Academic), and Chair, Senate Quality Assurance and Planning Committee

RE: Final Assessment Reports and Executive Summaries

The purpose of this memorandum is to request that Senate approve the Final Assessment Reports and Executive Summaries arising from cyclical program reviews. The request to Senate is based on recommendations from the Senate Quality Assurance and Planning Committee (SQAPC).

The Final Assessment Reports and Executive Summaries are provided pursuant to articles 4.2.5-4.2.6 of the provincial Quality Assurance Framework and article 7.2.23 of Carleton's Institutional Quality Assurance Process (IQAP). Article 7.2.23.3 of Carleton's IQAP (passed by Senate on June 21th, 2019 and ratified by the Ontario Universities Council on Quality Assurance on November 22nd, 2019) stipulates that, in approving Final Assessment Reports and Executive Summaries 'the role of SQAPC and Senate is to ensure that due process has been followed and that the conclusions and recommendations contained in the Final Assessment Report and Executive Summary are reasonable in terms of the documentation on which they are based.'

In making their recommendations to Senate and fulfilling their responsibilities under the IQAP, members of SQAPC were provided with all the appendices listed on page 2 of the Final Assessment Reports and Executive Summaries. These appendices constitute the basis for reviewing the process that was followed and assessing the appropriateness of the outcomes.

These appendices are not therefore included with the documentation for Senate. They can, however, be made available to Senators should they so wish.

Any major modifications described in the Implementation Plans, contained within the Final Assessment Reports, are subject to approval by the Senate Committee on Curriculum, Admission, and Studies Policy, the Senate Quality Assurance and Planning Committee (SQAPC) and Senate as outlined in articles 7.5.1 and 5.1 of Carleton's IQAP.

Once approved by Senate, the Final Assessment Reports, Executive Summaries and Implementation Plans will be forwarded to the Ontario Universities' Council on Quality Assurance and reported to Carleton's Board of Governors for information. The Executive Summaries and Implementation Plans will be posted on the website of Carleton University's Office of the Vice-Provost and Associate Vice-President (Academic), as required by the provincial Quality Assurance Framework and Carleton's IQAP.

Omnibus Motion

In order to expedite business with the multiple Final Assessment Reports and Executive Summaries that are subject to Senate approval at this meeting, the following omnibus motion will be moved.

Senators may wish to identify any of the following 5 Final Assessment Reports and Executive Summaries that they feel warrant individual discussion, that will then not be covered by the omnibus motion. Independent motions as set out below will nonetheless be written into the Senate minutes for those Final Assessment Reports and Executive Summaries that Senators agree can be covered by the omnibus motion.

THAT Senate approve the Final Assessment Reports and Executive Summaries arising from the Cyclical Reviews of the programs.

Final Assessment Reports and Executive Summaries

1. **Graduate Programs in Computer Science**
   SQAPC approval: September 23, 2021

SQAPC Motion:
THAT SQAPC recommends to SENATE the approval of the Final Assessment Report and Executive Summary arising from the cyclical program review of the graduate programs in Computer Science.

Senate Motion October 22, 2021:

THAT Senate approve the Final Assessment Report and Executive Summary arising from the Cyclical Review of the graduate programs in Computer Science.

2. **Undergraduate Programs in Communication and Media Studies**
   SQAPC approval: September 23, 2021

SQAPC Motion:
THAT SQAPC recommends to SENATE the approval of the Final Assessment Report and Executive Summary arising from the cyclical program review of the undergraduate programs in Communication and Media Studies.

Senate Motion October 22, 2021:

THAT Senate approve the Final Assessment Report and Executive Summary arising from the Cyclical Review of the undergraduate programs in Communication and Media Studies.

3. **PhD Program in Social Work**
   SQAPC approval: October 14, 2021

SQAPC Motion:
THAT SQAPC recommends to SENATE the approval of the Final Assessment Report and Executive Summary arising from the cyclical program review of the PhD program in Social Work.

Senate Motion October 22, 2021:

THAT Senate approve the Final Assessment Report and Executive Summary arising from the Cyclical Review of the PhD program in Social Work.

4. **Undergraduate Programs in Environmental Science**
   SQAPC approval: October 14, 2021

SQAPC Motion:

THAT SQAPC recommends to SENATE the approval of the Final Assessment Report and Executive Summary arising from the cyclical program review of the undergraduate programs in Environmental Science.

Senate Motion October 22, 2021:

THAT Senate approve the Final Assessment Report and Executive Summary arising from the Cyclical Review of the undergraduate programs in Environmental Science.

5. **Undergraduate Programs in Earth Sciences**
   SQAPC approval: October 14, 2021

SQAPC Motion:
THAT SQAPC recommends to SENATE the approval of the Final Assessment Report and Executive Summary arising from the cyclical program review of the undergraduate programs in Earth Sciences.

Senate Motion October 22, 2021:

THAT Senate approve the Final Assessment Report and Executive Summary arising from the Cyclical Review of the undergraduate programs in Earth Sciences.

CARLETON UNIVERSITY COMMITTEE ON QUALITY ASSURANCE
Cyclical Review of the Graduate Programs in Computer Science
Executive Summary and Final Assessment Report

This Executive Summary and Final Assessment Report of the cyclical review of Carleton and the University of Ottawa's joint graduate programs in Computer Science are provided pursuant to the provincial Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The graduate programs in Computer Science reside in the Ottawa-Carleton Institute for Computer Science, a unit administered by the School of Computer Science at Carleton University and the School of Electrical and Computer Engineering at the University of Ottawa.

As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The External Reviewers' report offered a very positive assessment of the programs. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the programs. These recommendations were productively addressed by the Director of the School of Computer Science, the Dean of the Faculty of Science and the Dean of the Faculty of Graduate and Postdoctoral Affairs at Carleton University and the Director and Associate Graduate Directors of the School of Electrical and Computer Engineering and the Dean of the Faculty of Engineering at the University of Ottawa in a response to the External Reviewers' report and Implementation on Plan that was submitted to SQAPC on August 26th, 2021.

FINAL ASSESSMENT REPORT

Introduction

The graduate programs in Computer Science reside in the Ottawa Carleton Institute for Computer Science, a unit administered by the School of Computer Science at Carleton University and the School of Electrical and Computer Engineering at the University of Ottawa. This review was conducted pursuant to the Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP). As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The site visit, which took place on November 30, December 1, 2 and 3, 2020, was conducted by Dr. Ioanis Nikolaidis from the University of Alberta, and Dr. Jean-Marc Robert from Ecole de Technologie Superieure Montreal. The site visit involved formal meetings with the Provost, the Vice-Provost and Associate Vice-President (Academic), the Dean of the Faculty of Science, the Dean of the Faculty of Graduate and Postdoctoral Affairs, and the Director of the School of the School of Computer Science at Carleton University and the Provost, the Director of the Office of Quality Assurance, The Vice-Provost (Academic Affairs), the Vice Provost (Graduate and Postdoctoral Studies), the Dean of the Faculty of Engineering and Design, The Director of the School of Electrical Engineering and Computer Science and the Graduate Associate Director of the School of Electrical Engineering and Computer Science at the University of Ottawa . The review committee also met with faculty members, contract instructors, staff, and graduate students from both Universities.

The External Reviewers' report, submitted in January 2021 offered a very positive assessment of the program.

This Final Assessment Report provides a summary of:

- Strengths of the programs
- Challenges faced by the programs
- Opportunities for program improvement and enhancement
- The Outcome of the Review
- The Implementation Plan

This report draws on five documents:

- The Self-study developed by members of the Ottawa-Carleton Institute for Computer Science (Appendix A)
- The Report of the External Review Committee (Appendix B).
- The response and implementation plan from the Director of the School of Computer Science and School of Electrical and Computer Engineering (Appendix C)
- The Response from the Dean of the Faculty of Science the Dean of the Faculty of Graduate and Postdoctoral Affairs and the Dean of the Faculty of Engineering (Appendix D).
- The internal discussants' recommendation reports (Appendix E).

Appendix F contains brief biographies of the members of the External Review Committee.

This Final Assessment Report contains the Implementation Plan (Appendix C) developed by the Directors of the School of Computer Science at Carleton University and School of Electrical and Computer Engineering, for the implementation of recommendations for program enhancement identified as part of the cyclical program review process.

The Implementation Plan identifies who is responsible for implementing the agreed upon recommendations, as well as the timelines for implementation and reporting.

Strengths of the programs

General

The External Reviewers' Report states that "The administrative structure has served the program well over the years. It has been able to handle the significantly high number of applications received each year in a prompt and efficient manner. The coordination across the institutions appears to be also working well and, at the time of the interviews, there were indications for better student-facing web-based services, through a common learning management platform (Brightspace). The success in attracting student applications is an indicator that the "marketing" of the program and/or the institute is working well. Interviews with the students confirmed that they were, overall, well informed about the expectations and the options available to them in the program".

Faculty

The external reviewers noted that "Both organisations have very strong research-oriented faculty members with lengthy peer reviewed research publication records. Both groups are successful obtaining research funding, from governmental programs as well as from industry. There are prestigious Chair positions at both departments: three Canada Research Chairs at Carleton, and four Canada Research Chairs, plus two University Research Chairs at the U. of Ottawa. The offered courses reflect the broad scope in CS covered by the expertise of the faculty members. New hires have added to the strength of the departments, expanding into new, trendy, topics in the field".

Students

The external reviewers noted that "Joint research success stories can be the catalyst for visibility and retention of strong BSc students into graduate studies. The option to follow an *accelerated* stream to recruit interested B.Sc. students already exists as reported".

Curriculum

The external reviewers noted that "The offered courses reflect the broad scope in CS covered by the expertise of the faculty members. New hires have added to the strength of the departments, expanding into new, trendy, topics in the field. From the interviews with the students the reviewers gained the firm impression that the students appreciated and made extensive use of the broad set of course offerings and the content of the courses met their needs and expectations. This is a major success indicator for the program".

Opportunities for program improvement and enhancement

The External Reviewers' Report made 13 recommendations for improvement:

1. Review and realign the OCICS admission process practices between the two organisations.

2 Include EDI priorities in the admission process.

3. Put in place a system to track the graduated M.Sc. and Ph.D. students. It is highly recommended to implement this as an “exit survey” for graduating students.

4. Put in place a system to track (i) the cross-organisational co-supervisions of the graduate students between the two organisations, and (ii) the cross-organisational statistics on the course enrolments.

5. Plan and advertise the graduate courses on a two-year horizon.

6. Put in place a mechanism to review new courses at OCICS BOM level.

7. Revaluate the long-term purpose of the joint programs.

8. Create a joint (“curriculum”?) program committee, including current students, graduates of the program and industrial contacts.

9. Promote success stories (especially in the fourth year of the bachelor program) of the accelerated stream to MSc programs.

10. Review the course offerings to reduce the size of popular courses (possibly offering some courses more frequently than others).

11. Evaluate the benefit of creating a methodology course for the M.Sc. and Ph.D. programs.

12. Evaluate the sustainability of the project-based M. Sc., which depends mainly on one of the two organisations and, even then, on only few professors supervising such projects.

13. Revaluate the purpose of the joint programs. They were essential in 1982, are they still necessary?

The Outcome of the Review

As a consequence of the review, the graduate programs in Computer Science were categorized by Carleton University’s Senate Quality Assurance and Planning Committee (SQAPC) as being of **GOOD QUALITY** (Carleton's IQAP 7.2.13).

The Implementation Plan

The recommendations that were put forward as a result of the review process were productively addressed by the Directors of the School of Computer Science at Carleton University and School of Electrical and Computer Engineering and the Dean’s from both Universities in responses to the External Reviewers’ report and Implementation Plan that was considered by SQAPC on August 26, 2021. The Institute agreed unconditionally to recommendations #1, 2, 3, 4, 6, 7, 8, 9, 12 and 13, and agreed to in principle to recommendations #5, 10 and 11.

It is to be noted that Carleton's IQAP provides for the monitoring of implementation plans. A monitoring report is to be submitted by the academic unit(s) and Faculty Dean(s), and forwarded to SQAPC for its review by September 30th, 2022.

The Next Cyclical Review

The next cyclical review of the graduate programs in Computer Science will be conducted during the 2023-24 academic year.

School of Computer Science
Unit Response to External Reviewers' Report & Implementation Plan
Programs Being Reviewed: Graduate Programs

Note: This document is forwarded to Senate, the Quality Council and posted on the Vice- Provost's external website.

Ottawa-Carleton Joint Programs in Computer Science (OCICS)
Master's of Computer Science (MCS)
PhD of Computer Science

Introduction & General Comments

The School of Computer Science (SCS) and School of Electrical Engineering and Computer Science (EECS) were very pleased to receive the Reviewers' very positive External Reviewers' report January 2021. This report was shared with our faculty and staff. We are committed to the continual improvement of our programs to enhance the student, staff, and faculty experience. This document contains both a response to the External Reviewers' Report and an Implementation Plan. They have been created in consultation with the Deans of both institutions.

For each recommendation one of the following responses has been selected:

Agreed to unconditionally: used when the unit agrees to and is able to take action on the recommendation without further consultation with any other parties internal or external to the unit.
Agreed to **if additional resources permit:** used when the unit agrees with the recommendation, however action can only be taken if additional resources are made available. Units must describe the resources needed to implement the recommendation and provide an explanation demonstrating how they plan to obtain those resources. In these cases, discussions with the Deans will normally be required and therefore identified as an action item.
Agreed to in principle: used when the unit agrees with the recommendation, however action is dependent on something other than resources. Units must describe these dependencies and determine what actions, if any, will be taken.
Not agreed to: used when the unit does not agree with the recommendation and therefore will not be taking further action. A rationale must be provided to indicate why the unit does not agree (no action should be associated with this response).

Response to External Reviewers' Report Committee

The response to the external reviewers' report was prepared by a committee comprising the following members:

School of Computer Science, Carleton University
Michel Barbeau, Director
Olga Baysal, Graduate Director (Recruitment and Admissions)
Jit Bose, Graduate Director (Program Management) & Director of the Ottawa-Carleton Institute for Computer Science

School of Electrical Engineering and Computer Science, University of Ottawa
Claude d'Amours, Director
Paola Flocchini, Past Graduate Associate Director
Jochen Lang, Graduate Associate Director

UNIT RESPONSE AND IMPLEMENTATION PLAN **Programs Being Reviewed: Master's of Computer Science (MCS) and PhD of Computer Science** **Prepared by: Michel Barbeau, Director, School of Computer Science**					
External Reviewer Recommendation & Categorization	**Unit Response:** **1- Agreed to unconditionally** **2- Agreed to if additional resources permit (describe resources)** **3- Agreed to in principle** **4- Not agreed to** **Rationales are required for categories 2, 3 & 4**	**Action Item**	**Owner**	**Timeline**	**Will the action described require calendar changes? (Y or N)**
Concern: Review and realign the OCICS admission process practices between the two organisations.	*1- Agreed to unconditionally*	*We have reviewed and aligned the OCICS admission process. Starting from Fall 2020, we have implemented a uniform admission process. See Appendix A for the details.*	*EECS' Graduate Associate Director* *SCS' Graduate Director (Recruitment and Admissions)*	*Implemented for the Fall 2021 admission cycle*	*N*

Concern: Include EDI priorities in the admission process.	*1- Agreed to unconditionally*	*We are committed to continuous progress towards full participation in our joint programs for all groups of individuals. Everyone should feel welcome to apply and join our graduate programs. We need all perspectives and all viewpoints.* *In the School of Computer Science, moving towards gender equity is a priority. Carleton's Faculty of Science, comprising the School of Computer Science, has planned, and started initiatives to help encourage and support female students, and to address gender imbalance at the graduate level. These initiatives include the ACE (Awareness, Collaboration and Engagement) EDI event series, development of inclusivity training to the faculty, inclusive hiring practices and outreach visits to elementary and high school classrooms by female scientists and professors and by inviting students to university labs. The School of Computer Science has its own EDI committee. Current activities include the design of computer science specific EDI statements, inclusive computer science teaching, hiring policies, student code of conduct and a research project to develop teaching and mentoring approaches aiming to significantly improve experience for students from under-represented minorities in computer science.* *Both institutions support societies that encourage women in computer science, including Women in Computer Science*	*EECS' Graduate Associate Director* *SCS' Graduate Director (Recruitment and Admissions)*	*Ongoing*	*N*

		(WiCS), Women in Science and Engineering (WISE), Tecnolgap and coding groups.			
Opportunity: Put in place a system to track the graduated M.Sc. and Ph.D. students. It is highly recommended to implement this as an "exit survey" for graduating students.	*1- Agreed to unconditionally*	*This an excellent idea. This data is of great value internally, and possibly for recruitment. We will develop an online exit questionnaire. We will provide access to students to the exit questionnaire when they complete their thesis defense.*	*Director of OCICS* *EECS' Graduate Associate Director* *SCS' Graduate* *SCS' Graduate Director (Program Management)*	*Form designed and implemented in the upcoming academic year*	*N*
Opportunity: Put in place a system to track (i) the cross-organisational co-supervisions of the graduate students between the two organisations, and (ii) the cross-organisational statistics on the course enrolments.	*1- Agreed to unconditionally*	*Very good idea! This data will be useful for planning the offered courses and track collaboration in the context of the joint programs. We will review the current information collection process to make sure this data is collected in the future.*	*EECS' Director* *SCS' Director* *Director of OCICS* *EECS' Graduate Associate Director* *SCS' Graduate Director (Program Management)*	*Upcoming academic year*	*N*
Opportunity: Plan and advertise the graduate courses on a two-year horizon.	*3- Agreed to in principle* *Good idea, but details need to be worked out. The key issue that needs to be addressed is the logistic behind the coordination of a two year plan of the two institutions.*	*We will investigate the possibility to announce a tentative 2nd year schedule.*	*EECS' Director* *SCS' Director*	*Fall 2021 and Winter 2022*	*N*

Opportunity: Put in place a mechanism to review new courses at OCICS BOM level.	*1- Agreed to unconditionally*	*The process for the introduction of new courses has been reviewed. It is detailed in Appendix B.*	*EECS' Graduate Associate Director* *SCS' Graduate Director (Program Management)* *Director of OCICS*	*Effective Winter 2021*	*N*
Concern: Revaluate the long-term purpose of the joint programs.	*1- Agreed to unconditionally*	*The review committee examined the long-term purpose of the joint programs. The review committee is in the opinion that the joint program has considerable benefits including 1) the access for the graduate students to a large selection of pooled courses and 2) the availability of a wide range of skills for the constitution of thesis examination committees. Graduate students seamlessly register and follow courses in the other institution, no need for a course equivalence recognition mechanism.* *Moreover, this environment promotes the creation of research collaborations. In the last five years, researchers from the two institutions have co-signed a good number of joint publications. For example, during the last five years co-authors include Barbeau-Nayak, Bose-Morin-Dujmovic, Flocchini-Kranakis, and Flocchini-Santoro. The review committee is in the opinion that this aspect can be further developed in the future. There are also some co-supervisions of graduate students and PDFs. In the past, we co-organized*	*EECS' Director* *SCS' Director* *Director of OCICS* *EECS' Graduate Associate Director* *SCS' Graduate Director (Recruitment and Admissions)* *SCS' Graduate Director (Program Management)*	*Done*	*N*

		conferences, workshops and schools, where members of both the institutions participated, including the funding applications. *The two institutions are not competitors but rather allies that work together to offer in the Ottawa area the best possible graduate programs in computer science.*			
Concern: Create a joint ("curriculum"?) program committee, including current students, graduates of the program and industrial contacts.	*1- Agreed to unconditionally*	*We understand that this refers to the creation of a Program Advisory Board (PAC). We will create a PAC comprising the Directors, Graduate Directors and representative from industry, government, and academia.*	*Director of OCICS*	*1st meeting expected Fall 2021*	*N*
Opportunity: Promote success stories (especially in the fourth year of the bachelor program) of the accelerated stream to MSc programs.	*1- Agreed to unconditionally*	*We will reach out supervisors and graduates to collect success stories and testimonies. We will integrate success stories in open house, poster day, OCICS web site, viewbooks and graduate study booklets.*	*Director of OCICS* *EECS' Graduate Associate Director* *SCS' Graduate Director (Recruitment and Admissions)* *SCS' Graduate Director (Program Management)*	*Fall (Carleton), Winter (uOttawa)*	*N*
Concern: Review the course offerings to reduce the size of popular courses (possibly offering some courses more frequently than others).	*3- Agreed to in principle* *We to examine and take into constraints of faculty workloads.*	*Look at graduate course enrolment. Consider offering certain courses twice a year. Low enrolment offered every other year.*	*EECS' Director* *SCS' Director*	*Upcoming academic year*	*N*

Opportunity: Evaluate the benefit of creating a methodology course for the M.Sc. and Ph.D. programs.	*3- Agreed to in principle* *We will examine this opportunity and the many ways it can be implemented in the upcoming year.*	*The board of management will explore this opportunity.*	*Board of Management*	*Upcoming academic year*	*N*
Weakness: Evaluate the sustainability of the project-based M. Sc., which depends mainly on one of the two organisations and, even then, on only few professors supervising such projects.	*1- Agreed to unconditionally*	*See Appendix C*	*EECS' Director* *SCS' Director* *Director of OCICS* *EECS' Graduate Associate Director* *SCS' Graduate Director (Recruitment and Admissions)* *SCS' Graduate Director (Program Management)*	*Done*	*N*
Weakness: Revaluate the purpose of the joint programs. They were essential in 1982, are they still necessary?	*1- Agreed to unconditionally*	*This echoes the concern "Revaluate the long-term purpose of the joint programs." The review committee reevaluated the purpose of the joint programs. In addition to the benefits listed above, it can be said that OCICS now comprises close to 73 faculty members. In size, the joint institute is comparable to other large computer science graduate programs in Canada, such as programs offered by Toronto and McGill.*	*EECS' Director* *SCS' Director* *Director of OCICS* *EECS' Graduate Associate Director* *SCS' Graduate Director (Recruitment and Admissions)* *SCS' Graduate Director*	*Done*	*N*

			(Program Management)		

Appendix A: Review of the OCICS admission process practices between the two organizations

The admission process has been reviewed in both institutions. It is effective for the current admission cycle, i.e., students admitted for Fall 2021. The processes are very similar in both organizations, with slight differences due to different student evaluation scales. The processes are outlined in the sequel.

School of Computer Science, Carleton University

The admission process is managed by the Graduate Director (Recruitment and Admissions), two Graduate Administrators and a Graduate Admission Committee, consisting of four faculty members. The Graduate Administrators pre-screen applications by calculating GPA averages. Then, the Graduate Admissions Committee evaluates each application and offers their recommendations (including comments on applications). The committee considers the applicant's overall academic standing, publication record, recommendation letters, relevant work experience, language proficiency, etc. The recommendations are then shared with faculty for further assessment. Faculty then express their interest in admitting students based on the committee's recommendation, as well as their own communication (email or interview) with the potential student (a common practice). No PhD/thesis-based Master's students are admitted without a supervisor. Project based MCS are typically self-funded. We accept a small percentage of project based MCS.

The actual admission's averages for OCICS programs at Carleton University based on pre-COVID-19 admission's data are listed in Table I. Carleton University uses a scale out of 12 and 11.0 corresponds to A, while 10.0 corresponds to A-.

Table I: Actual Admission's Averages for OCICS Programs at Carleton University.

Program	Average Entrance GPA
PhD - Domestic	11.6
PhD - International	10.5
MSC - Domestic	10.0
MSC - International	10.8

A threshold is enforced for international MCS applications, which is a minimum GPA of B+ (9.0). However, due to the highly competitive nature of the program A- (10.0) is required in practice.

School of Electrical Engineering and Computer Science, University of Ottawa

The process at EECS is as follows. The applications are processed by the staff in the graduate office of the Faculty of Engineering. A staff member calculates the admission's average which is a credit-weighted average of the 20 last courses taken by an applicant. When an applicant fails to meet the admission averages for the respective program, the file is rejected. We may exceptionally look at PhD applicants and thesis Master's students with identified supervisor. All files that pass the initial screening are reviewed by two members of the admission's committee. The committee considers preparation as indicated by completion of core CS courses, recommendation letters, quality of undergraduate education, work experience, level of English (or French). Then, the Graduate Director makes a decision to either recommend admission, circulate the file if no supervisor is identified or reject. No thesis-based student is admitted without supervisor. We apply the same general process for all programs except that applicants to the project-based programs do not require a supervisor for admissions.

The admission cut-off averages that are currently in place at the University of Ottawa are given in Table II. The University of Ottawa uses a scale out of 10 and the corresponding levels are 8.0 (A-), 7.5 (B+) and 7.0 (B). It should be noted that the averages listed in Table II are minimum admission's standard and in practice students with much higher admission's averages are admitted.

Table II: Admission's Cut-off Averages for OCICS Programs at the University of Ottawa.

Admission Cut-Off Average	CSI
Ph.D.	8.0
Master's Thesis CDN/PR	7.0
Master's Thesis Int.	7.5
Master Project CND/PR	8.0
Master Project Int.	8.0

Appendix B: Mechanism to review new courses at OCICS BOM level

The process for the introduction of new courses has been reviewed. Here are the details.

Topics Courses

A faculty member of one institute that wishes to introduce a new topics course contacts the director of the OCICS graduate program within their institution. To initiate the process, the member must provide a course outline of the proposed course for feedback, highlight potential overlap with existing OCICS graduate courses and must identify the area of the course with a justification. A course is deemed to fall within an area provided that at least 40% of the course content falls within that area. A single area is preferred but up to two areas are accepted in exceptional circumstances. The application is then circulated to members with related research or teaching interests. Collegial feedback is incorporated and then the course outline is communicated to the OCICS director of the other institution for further feedback. The topics course is then approved to be scheduled if resources are available to offer the course. The topics course receives a course code in both institutions to easily allow graduate students from both institutions to take the course. A topics course is offered two to three times to gauge interest by students, receive feedback from students and ensure the course is sustainable. The next step is an application to make the course a permanent OCICS course.

Permanent Courses

Permanent courses have their own dedicated course code in both institutions. To establish a permanent course, the proposed course has to be offered as a topics course at least two or three times with good student enrolment, i.e., enrolment in-line with other OCICS graduate courses. The faculty member proposing to convert a topics course into a permanent course then forwards the application to the OCICS director in their institution. The application includes an up-to-date course outline, an identification of the area the course falls in and a list of potential overlap with existing graduate courses. The application is then brought to OCICS BoM for discussion and possible approval. The BoM may seek additional clarification and feedback from other faculty members in both institutions. The BoM then decides if the course should be given a permanent course code. When the course is approved by BoM, the process to acquire permanent course codes for new courses at both universities is initiated.

Permanent courses may be removed if they are not offered for several years, the description of the course becomes dated or there is no OCICS member that can teach the course. Removal of

the course requires the approval of the BoM and of both the universities.

Appendix C: Sustainability of the Project-Based MCS Program

Enrolment Trends: No Increase in Recent Years

The project-based Master's program in computer science at the University of Ottawa has stable enrolment. The program is extremely popular and receives many applications. For the Fall 2021, we have received 1525 applications for the project-based Master's as of Feb. 22, 2021. This number represents an increase of 145 applications from the year before despite the impact of Covid-19. Nevertheless, the number of admitted student have been kept stable at a level which can be well-managed given the resources in the School of EECS at the University of Ottawa and within OCICS. This is managed by increasing admission requirements to maintain enrolment at manageable levels.

In the Fall 2019, 42 students registered for the course-based program while in the Fall 2020, 38 students registered. Only a small number of students start their studies in the Winter. There was a small drop due to COVID-19 but the numbers are relatively stable since at least the Fall 2018. The goal for this year is again to keep enrolment stable.

Range of Supervisors

Several OCICS members chose to supervise MCS project-based student. In the Winter 2021, the following members supervise at least one project: Drs. Diana Inkpen, Burak Kantarci, WonSook Lee, Lucia Moura, Jochen Lang and Hussein Mouftah. In previous terms, additional OCICS members outside the School of EECS have (co-)supervised projects including Dr. Oliver van Kaick from Carleton University or Dr. Pascal Fallavollita from the Faculty of Health Sciences at the University of Ottawa, who is cross appointed to the School of EECS. Members chose to supervise projects for various reasons. Some projects explore a topic related to but not central to current research, some projects explore a preliminary research idea, others focus on implementation of research and yet others are part of a larger team effort.

Benefits of the Project-Based MCS Program

The project-based program clearly fills a need as evidenced by the large number of applications. It attracts applications by international students but also by a considerable number of local applicants. It attracts applicants that are focused on a career in industry or government but even students interested in research sometimes chose this route to enter their graduate studies. Some project-based students transition into the thesis-based program after 1 or 2 semesters. The students also provide a benefit to industry in the Ottawa area as can be seen by the considerable number of Co-Op terms offered to project-based Master's student by local industry and government. The program is also beneficial for OCICS as a whole. Project-based student are required to take 8 courses and as such they increase enrolment and allow OCICS to offer more and a wider variety of courses to all graduate students. Furthermore, the international students often come from first class universities around the world bringing a different focus and outlook to the courses in OCICS and enriching the experience for all students. Finally, faculty members benefit by supervising projects but also by having a potential pool of students that they may attract to their own research.

CARLETON UNIVERSITY COMMITTEE ON QUALITY ASSURANCE
Cyclical Review of the undergraduate programs in Communication and Media Studies
Executive Summary and Final Assessment Report

This Executive Summary and Final Assessment Report of the cyclical review of Carleton's undergraduate programs in Communication and Media Studies are provided pursuant to the provincial Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The undergraduate programs in Communication and Media Studies reside in the School of Journalism and Communication, a unit administered by the Faculty of Public Affairs.

As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The External Reviewers' report offered a very positive assessment of the programs. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the programs. These recommendations were productively addressed by the Director of the School of Journalism and Communication and the Dean of the Faculty of Public Affairs in responses to the External Reviewers' report and Implementation Plan that was submitted to SQAPC on August 26, 2021.

FINAL ASSESSMENT REPORT

Introduction

The undergraduate programs in Communication and Media Studies reside in the School of Journalism and Communication, a unit administered by the Faculty of Public Affairs. This review was conducted pursuant to the Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP). As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The site visit, which took place on January 18-20, 2021, was conducted by Dr. Jonathan Finn from Wilfrid Laurier University and Dr. Tanner Mirrlees from Ontario Tech University. The site visit involved formal meetings with the Provost, the Vice-Provost and Associate Vice-President (Academic), the Dean of the Faculty of Public Affairs and the Director of the School of Journalism and Communication. The review committee also met with faculty members, staff, and undergraduate students.

The External Reviewers' report, submitted on February 19, 2021, offered a very positive assessment of the program.

This Final Assessment Report provides a summary of:

- Strengths of the programs
- Challenges faced by the programs
- Opportunities for program improvement and enhancement
- The Outcome of the Review
- The Implementation Plan

This report draws on five documents:

- The Self-study developed by members of the School of Journalism and Communication (Appendix A)
- The Report of the External Review Committee (Appendix B).
- The response and implementation plan from the Director of the School of Journalism and Communication (Appendix C)
- The Response from the Dean of the Faculty of Public Affairs (Appendix D).
- The internal discussant's recommendation report (Appendix E).

Appendix F contains brief biographies of the members of the External Review Committee.

This Final Assessment Report contains the Implementation Plan (Appendix C) developed by the Director of the School of Journalism and Communication Studies and the Dean of the Faculty of Public Affairs, for the implementation of recommendations for program enhancement identified as part of the cyclical program review process.

The Implementation Plan identifies who is responsible for implementing the agreed upon recommendations, as well as the timelines for implementation and reporting.

Strengths of the programs

General

External reviewers were satisfied with the program which they described as 'excellent', and praised the quality and engagement of faculty, staff and students. They felt the program directly supports Carleton's strategic mission and enhances student experience. They felt that ''the School of Journalism and Communication's current governance and administrative structure resulted from a unique institutional history, and the structure supports the semi autonomy of two programs, including the communication in media studies program. On the whole the programs governance structure works very well and is supported by strong leadership and a collegial faculty."

Faculty

External reviewers felt that the program's faculty profile was excellent and reflected leading communication and media researchers in Canada and had the following comments:

''The faculty has an impressive record of teaching innovation and research including a successful history of grant funding. Faculty and staff in communication and media studies were diligent in their efforts to enhance student culture. Faculty are productive, talented teachers and researchers making a concerted effort to provide a thorough, grounded and up-to-date degree"

Students

The external reviewers believe the program to have a 'vibrant student culture' and received positive feedback from students. Students complemented the flexibility of the degree and several highlighted the relevance of subject matter as a time to larger social issues in their own lived experience. The external reviewers felt that positive student response was a clear reflection of the strength of the Communication and Media studies program.

Curriculum

The external reviewers described the program's curriculum as comprehensive and stated

"It runs the whole gamut of key topic areas and subfields in contemporary communication and media studies. The faculty have also pushed the curriculum forward in new and positive directions by integrating significant developments in critical race theory, critical disability studies and science, risk and Health Communications. We encourage these advances. The program's modes of delivery are generally appropriate to achieving the program level learning outcomes, and encompasses mix of large, mid range and small classes, from years one to four."

Opportunities for program improvement and enhancement

The External Reviewers' Report made 6 recommendations for improvement:

1. That the program hire one full time staff member.
2. That the program received increase TA support.
3. That the program investigate standardizing class sizes.
4. That the program's load measure be reduced.
5. That the program re-examine its 1000 level courses.

6. That the program considering creating a set of governing principles.

The Outcome of the Review

As a consequence of the review, the undergraduate programs in Communication and Media Studies were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of **GOOD QUALITY** (Carleton's IQAP 7.2.13).

The Implementation Plan

The recommendations that were put forward as a result of the review process were productively addressed by the Director of the School of Journalism and Communication and the Dean of the Faculty of Public Affairs, in a response to the External Reviewers' report and Implementation Plan that was considered by SQAPC on August 26, 2021. The School agreed if resources permit to recommendations #1, 2, 3, and 4 and agreed in principle to recommendations #5 and 6.

It is to be noted that Carleton's IQAP provides for the monitoring of implementation plans. A monitoring report is to be submitted by the School of Journalism and Communication and the Dean of the Faculty of Public Affairs for its review by June 30th, 2023.

The Next Cyclical Review

The next cyclical review of the undergraduate programs in Communication and Media Studies will be conducted during the 2026-27 academic year.

Communication and Media Studies
Unit Response to External Reviewers' Report & Implementation Plan
Programs Being Reviewed: Undergraduate Programs

Note: This document is forwarded to Senate, the Quality Council and posted on the Vice- Provost's external website.

Introduction & General Comments

Please include any general comments regarding the External Reviewers' Report.

The Communication and Media Studies (COMS) program is pleased with the observations of the external assessors and the conclusions in their report about the Bachelor of Communication and Media Studies (B.CoMS) degree. The report notes that the COMS program enjoys an excellent reputation, evidenced by a progressive and comprehensive B.CoMS curriculum, prominent and award-winning faculty and staff, a record of strong recruitment and retention, significant contributions to FPA and pan-university initiatives, and collegial governance. However, it also raises some concerns that could undermine the program's strengths and its ability to continue supporting important academic initiatives across campus. Most significantly, it identifies problems with current levels of professional staffing to support student advising and concerns about a higher faculty workload relative to the norm in FPA and at Carleton. The report calls for the University to pay attention to both issues, recommendations with which the program fully agrees. The COMS program is committed to working collaboratively with the University and the Office of the Dean, FPA, to develop a strategy that will address these vulnerabilities. The report also identifies other areas of priority and opportunity, including initiatives relating to curricular development and governance, which the program will address over the next two years. Finally, although not recommended by the reviewers, the program is undertaking an assessment of learning objectives and a review of the current B.CoMS curriculum to identify outdated courses for removal and new courses that can be added to the program that reflect both developments in the field and the expertise of recently hired faculty members.

For each recommendation one of the following responses must be selected:

Agreed to unconditionally: used when the unit agrees to and is able to take action on the recommendation without further consultation with any other parties internal or external to the unit.
Agreed to **if additional resources permit:** used when the unit agrees with the recommendation, however action can only be taken if additional resources are made available. Units must describe the resources needed to implement the recommendation and provide an explanation demonstrating how they plan to obtain those resources. In these cases, discussions with the Deans will normally be required and therefore identified as an action item.
Agreed to in principle: used when the unit agrees with the recommendation, however action is dependent on something other than resources.

Units must describe these dependencies and determine what actions, if any, will be taken.
Not agreed to: used when the unit does not agree with the recommendation and therefore will not be taking further action. A rationale must be provided to indicate why the unit does not agree (no action should be associated with this response).

Calendar Changes
If any of the action items you intend to implement will result in calendar changes, please describe what those changes will be. To submit a formal calendar change, please do so using the Courseleaf system.

UNIT RESPONSE AND IMPLEMENTATION PLAN

Programs Being Reviewed: Bachelor of Communication and Media Studies

Prepared by (name/position/unit): Josh Greenberg, Program Head, Communication and Media Studies

External Reviewer Recommendation & Categorization	Unit Response: 1- Agreed to unconditionally 2- Agreed to if additional resources permit (describe resources) 3- Agreed to in principle 4- Not agreed to Rationales are required for categories 2, 3 & 4	Action Item	Owner	Timeline	Will the action described require calendar changes? (Y or N)
1. That the program hire one full-time staff member. (Weakness) This is the only recommendation we identify as a weakness in the program. And it is based in a need that was continually made clear throughout our visit. The existing staffing complement is less than the normal amount of other, comparable units in the Faculty. We commend the existing staff for handling the significant workload associated with the program and their clear dedication to helping students; however, it is also quite apparent that the current workload of staff is unsustainable. A dedicated, full-time staff position is essential.	2 – Base funding for new staff positions will be required	The program head made a formal request to the Dean of FPA in March 2021 for an increase in staffing resources to support student advising and program administration needs. The Dean acknowledges the staffing challenges in the program and has agreed to work with the program head to explore financially-viable solutions to address the staffing concerns.	Dean FPA	Winter 2021 and ongoing	N

2. That the program receive increased TA support. (Concern) We heard and noted concerns about both the workload of existing TAs and the lack of sufficient number of TAs to meet program learning outcomes. Given the size of the program and its 1000-level undergraduate classes, it is imperative that B.CoMS receive more TA support.	2 – Base funding for more TA resources than are currently assigned to the program will be required.	The program head submitted a formal request and proposal to the Dean FPA during the 2021 annual budget negotiations to make adjustments to the TA numbers allocated by the Faculty to Communication and Media Studies. This request was not accepted as it would have required making an exception to the TA allocation formula that is currently applied to comparable units in the Faculty. The program head will continue to push for this change moving forward.	Dean FPA	Winter 2022	N
3. That the program investigate standardizing class sizes. (Concern) It is expected that class sizes vary across 1000 through 4000 level courses; however, there are uncommon levels of variation within individual years. This is most pronounced at the 3000-level where class size can reach 150. 4000-level 'caps' seem overly flexible, ranging from 10-40, within and between academic terms. Standardizing class sizes could help build stability into the program, mitigate disparities in workload and improve planning.	2 – Base funding for more permanent, continuing faculty positions and contract instructors to ensure availability of more courses.	The program head and Dean FPA agree on the need for better standardization of class sizes across all levels of the program. A budget request was submitted and approved by the Dean FPA to achieve incremental progress on this recommendation for the 2021-22 academic year. Both the program head and Dean will continue to work together to ensure even greater levels of consistency in future planning cycles.	COMS & Dean FPA	Winter 2022	N
4. That the program's load measure be reduced. (Concern) The load measure in Communication and Media Studies is significantly higher than what is considered normal in the Faculty. This has clear, negative impacts on the effective administration of the program as well as the quality of teaching and learning. We recommend that the program and Dean work to establish a more realistic and equitable load measure with the goal of meeting this target by the next cyclical review.	2 – Base funding for new permanent, continuing faculty positions is required to address this concern or a strategy that would better align the size of the program with the current faculty complement.	The program head will request that the Dean advocate for additional faculty teaching positions for COMS in her annual budget request to the University while also advocating to ensure that positions lost through retirements and/or pre-tenure resignations are returned to the program. The program head also intends to actively seek more faculty positions through the Faculty's competitive position allocation process, as positions become available.	COMS and Dean FPA	Summer 2021 and ongoing	N

5. That the program re-examine its 1000- level courses. (Opportunity) While we didn't hear specific complaints about the 1000-level courses from students or faculty, there could be benefit in reexamining the courses to better reflect the program's goals at the introductory level. There is a clear desire to enhance writing instruction at the 1000-level, though this is contingent on better TA support as in Recommendation #2.	*3*	*The program feels that the current 1000-level courses are fulfilling stated DLEs and learning outcomes. However, we are open to re-examining our first-year courses to identify ways in which we might place greater emphasis on teaching interculturally aware and equity-minded fundamental writing instruction specific to Communication and Media Studies and of developing additional courses and/or modules to be delivered throughout all years of the program. This would require a new hire in the broad area of composition studies.*	*COMS*	*2021-22*	*Y*
6. That the program consider creating a set of governing principles. (Opportunity) The program has steadily grown in size since the last cyclical review. For purposes of continuity, clarity and equity, we wondered if the program should consider creating a set of guiding principles. We stress that this is not something the program should be made to do, nor that it need be a long list of rigid policies; instead, we ask that they take up the issue for consideration.	*3*	*There are no problems currently with the program's organizational culture to suggest this as a necessary step. However, we recognize the benefits of establishing a written set of governing principles or at the very least a program mission statement that would serve as a guiding framework for organization decision-making at the program and committee levels. Given the large numbers of faculty members who will be on sabbatical in 2021-22, the program will commit to initiating a discussion about this opportunity in the 2022-23 academic year.*	*COMS*	*2022-23*	*N*

CARLETON UNIVERSITY COMMITTEE ON
QUALITY ASSURANCE
Cyclical Review of the PhD program
in Social Work
Executive Summary and Final Assessment Report

This Executive Summary and Final Assessment Report of the cyclical review of Carleton's PhD program in Social Work is provided pursuant to the provincial Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The PhD program in Social Work resides in the School of Social Work, a unit administered by the Faculty of Public Affairs.

As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The External Reviewers' report offered a very positive assessment of the programs. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the programs. These recommendations were productively addressed by the Director of the School of Social Work and the Dean of the Faculty of Public Affairs in responses to the External Reviewers' report and Implementation Plan that was submitted to SQAPC on September 9, 2021.

FINAL ASSESSMENT REPORT

Introduction

The PhD program in Social Work resides in the School of Social Work, a unit administered by the Faculty of Public Affairs. This review was conducted pursuant to the Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP). As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The site visit, which took place on May 17-19, 2021, was conducted by Dr. David Este from the University of Calgary and Dr. Lea Caragata from the University of British Columbia. The site visit involved formal meetings with the Provost, the Vice-Provost and Associate Vice-President (Academic), the Dean of the Faculty of Public Affairs and the Director of the School of Social work. The review committee also met with faculty members, staff, and students.

The External Reviewers' report, submitted on June 23, 2021, offered a very positive assessment of the program.

This Final Assessment Report provides a summary of:

- Strengths of the programs
- Challenges faced by the programs
- Opportunities for program improvement and enhancement
- The Outcome of the Review
- The Implementation Plan

This report draws on five documents:

- The Self-study developed by members of the School of Social Work (Appendix A)
- The Report of the External Review Committee (Appendix B).
- The response and implementation plan from the Director of the School of Social Work (Appendix C)
- The Response from the Dean of the Faculty of Public Affairs (Appendix D).
- The internal discussant's recommendation report (Appendix E).

Appendix F contains brief biographies of the members of the External Review Committee.

This Final Assessment Report contains the Implementation Plan (Appendix C) developed by the Director of the School of Social Work and the Dean of the Faculty of Public Affairs, for the implementation of recommendations for program enhancement identified as part of the cyclical program review process.

The Implementation Plan identifies who is responsible for implementing the agreed upon recommendations, as well as the timelines for implementation and reporting.

Strengths of the programs

General

External reviewers reported that "*The program appears to be appropriately governed with representation from students on relevant committees. The administration of the program also appeared to be effective with strong committed staff who had been part of the program for extended time periods".*

Faculty

External reviewers note that *"It is quite evident that the School has clearly demonstrated a strong commitment to having a diverse faculty complement"* and "*One of the clear tangible results in the reinvestment of new faculty members is the impressive research intensification of the School of Social Work. This is demonstrated with the increase of grants from Tri-Council such as the Social Sciences and Humanities Research Council. We also noted increased productivity in products such as peer reviewed journal articles and prior to the pandemic, juried conference presentations. Some doctoral students have benefitted by the success of faculty members receiving grants as opportunities to work as research assistants/coordinators as well as co-author publications and serving as presenters at conferences"*.

Students

External reviewers noted that "*Based on the introductions provided by the doctoral students we met, the involvement in research projects held by faculty members as well as engaging in the production of scholarly activities such as peer reviewed journal publications and juried conference presentations, the program is attracting strong students. A positive attribute nearly cited by each student who spoke are the opportunities to gain considerable teaching experiences as teaching assistants as well as teaching courses in the BSW program".* They also indicated that "*Two additional indicators of the quality of students in the program include greater success of the program student being recipients of major external scholarships and secondly, that at least three candidates were hired into tenure track positions in Canadian faculties/schools of social work prior to completing their programs*".

Curriculum

External reviewers indicated that "*The program appears to have clear and well aligned learning outcomes. We heard of no issues with respect to the assessment of students' learning and did hear from students and faculty that the offering of choice in the comprehensive process was both appreciated and well utilized".*

<u>Opportunities for program improvement and enhancement</u>

The External Reviewers' Report made 4 recommendations for improvement. That the program:

1. Increase the profile of the Carleton PhD program; utilize the resources offered by the Faculty and Faculty of Graduate and Postdoctoral Studies to enhance recruitment efforts. That the program received increase TA support (Opportunity/Concern).
2. Consider processes and resources necessary to improve students' time to completion (Concern).
3. Engage in a full curriculum review to better align doctoral courses with those of comparator doctoral programs and to ensure a stronger research focus. (Weakness).

4. Explore possibilities for increasing the amount of fiscal support by the School/University for students in the program. (Weakness)

The Outcome of the Review

As a consequence of the review, the PhD program in Social Work was categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of **GOOD QUALITY** (Carleton's IQAP 7.2.13).

The Implementation Plan

The recommendations that were put forward as a result of the review process were productively addressed by the Director of the School of Social Work and the Dean of the Faculty of Public Affairs, in a response to the External Reviewers' report and Implementation Plan that was considered by SQAPC on September 9, 2021. The School agreed unconditionally to recommendations #1 and 3, agreed to recommendation #4 if resources permit, and agreed in principle to recommendation #2.

It is to be noted that Carleton's IQAP provides for the monitoring of implementation plans. A monitoring report is to be submitted by the School of Social Work and the Dean of the Faculty of Public Affairs for its review by June 30th, 2024.

The Next Cyclical Review

The next cyclical review of the PhD program in Social work will be conducted during the 2027-28 academic year.

Unit Response to External Reviewers' Report & Implementation Plan
Programs Being Reviewed: PhD Social Work

Note: This document is forwarded to Senate, the Quality Council and posted on the Vice- Provost's external website.

Introduction & General Comments

The School of Social Work was pleased to receive the External Reviewers' report on July 7, 2021. The report was shared with the program supervisor and staff and will be discussed at the faculty retreat in August 2021. We are committed to the continual improvement of our programs to enhance the student, staff, and faculty experience. This report contains both a response to the External Reviewers' Report and an Implementation Plan (Section B) which have been created in consultation with the Dean of the Faculty of Public Affairs.

For each recommendation **one** of the following responses must be selected:

Agreed to unconditionally: used when the unit agrees to and is able to take action on the recommendation without further consultation with any other parties internal or external to the unit.
Agreed to if **additional resources permit:** used when the unit agrees with the recommendation, however action can only be taken if additional resources are made available. Units must describe the resources needed to implement the recommendation and provide an explanation demonstrating how they plan to obtain those resources. In these cases, discussions with the Deans will normally be required and therefore identified as an action item.
Agreed to in principle: used when the unit agrees with the recommendation, however action is dependent on something other than resources. Units must describe these dependencies and determine what actions, if any, will be taken.
Not agreed to: used when the unit does not agree with the recommendation and therefore will not be taking further action. A rationale must be provided to indicate why the unit does not agree (no action should be associated with this response).

Calendar Changes

If any of the action items you intend to implement will result in calendar changes, please describe what those changes will be. To submit a formal calendar change, please do so using the Courseleaf system.

UNIT RESPONSE AND IMPLEMENTATION PLAN **Programs Being Reviewed: Social Work** **Prepared by (name/position/unit): Sarah Todd, Director, Social Work**					
External Reviewer Recommendation & Categorization	**Unit Response (choose only one for each recommendation):** **1- Agreed to unconditionally** **2- Agreed to if additional resources permit (describe resources)** **3- Agreed to in principle** **4- Not agreed to** **Rationales are required for categories 2, 3 & 4**	**Action Item**	**Owner**	**Timeline**	**Will the action described require calendar changes? (Y or N)**
Increase the profile of the Carleton PhD program; utilize the resources offered by the Faculty and Faculty of Graduate and Postdoctoral Studies to enhance recruitment efforts. (Opportunity/Concern)	1 - Agreed to unconditionally	Graduate program supervisor will work with the graduate committee to better articulate the PhD program focus for recruitment. Graduate Supervisor and Director will organize a meeting with FGPA to understand what steps we could take to enhance recruitment efforts and will implement suggestions.	Graduate Supervisor and Director	Meetings August - September 2021 Implementation beginning fall 2021 and onwards	N
Consider processes and resources necessary to improve students' time to completion. (Concern)	3 - Agreed to in principle	Graduate Supervisor and Director will survey doctoral students to understand what would help with their times to completion. Graduate Supervisor and Director will draft a tip sheet for supervisors and establish structures/processes to build a more effective system of peer support.	Graduate supervisor and Director	Survey development at graduate committee fall 2021 Implementation of survey by Graduate Supervisor January 2022 Tip sheet for supervisors developed winter	N

				2022 for distribution spring 2022 (Pat and Sarah). Establish peer support system with feedback from students for fall 2022.	
Engage in a full curriculum review to better align doctoral courses with those of comparator doctoral programs and to ensure a stronger research focus. (Weakness)	1 - Agree unconditionally	Fall/Winter 2021-2022, the graduate committee will lay out a plan to review the Phd program in 2022/2023. Graduate committee to review doctoral program against 5 comparator doctoral programs with the goal of creating a stronger research focus. Graduate committee to make recommendations to departmental board regarding strengthening the research focus of the program. Any changes to the PhD curriculum will be made in consultation with FGPA and FPA and will follow the required processes for modifying academic programs. Support faculty to make program transition.	Graduate Program committee and Graduate Supervisor	Fall/Winter 2021-2022, plan development. Fall 2022 – Graduate Supervisor will lead review with the graduate committee. Consultation with FGPA and FPA. Committee to make recommendations to Departmental Board January 2023. Any proposed changes will go through FGPA and the required processes/timelines for modifying academic programs	Possibly (focus may be on enhancing content of existing courses and/or changes to existing courses and/or calendar changes)

				Any required administrative changes spring – summer 2023 for implementation 2024. Support to instructors spring-summer 2023	
Explore possibilities for increasing the amount of fiscal support by the School/University for students in the program. (Weakness)	2 - Agreed to if resources permit	Discussions with FGPA about ongoing funding packages	Graduate program supervisor	Ongoing	N

CARLETON UNIVERSITY COMMITTEE ON
QUALITY ASSURANCE
Cyclical Review of the Undergraduate Programs in Environmental Science

Executive Summary and Final Assessment Report

This Executive Summary and Final Assessment Report of the cyclical review of Carleton's undergraduate programs in Environmental Science are provided pursuant to the provincial Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The undergraduate programs in Environmental Science reside in the Institute for Environmental and Interdisciplinary Sciences, a unit administered by the Faculty of Science.

As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The External Reviewers' report offered a very positive assessment of the programs. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the programs. These recommendations were productively addressed by the Director of the Institute for Environmental and Interdisciplinary Sciences and the Dean of the Faculty of Science in responses to the External Reviewers' report and Implementation Plan that was submitted to SQAPC on September 9, 2021.

FINAL ASSESSMENT REPORT

Introduction

The undergraduate programs in Environmental Science reside in the Institute for Environmental and Interdisciplinary Sciences, a unit administered by the Faculty of Science. This review was conducted pursuant to the Quality Assurance Framework and Carleton's Institutional Quality Process (IQAP). As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The site visit, which took place On April 26-28, 2021, was conducted by Dr. Grant Wach, Dalhousie University and Dr. Neil Rooney, University of Guelph. The site visit involved formal meetings with the Provost, the Vice-Provost and Associate Vice-President (Academic), the Dean of the Faculty of Science, the Director of the Institute for Environmental and Interdisciplinary Sciences, students, faculty and staff.

The External Reviewers' report, submitted on May 18th, 2021 offered a very positive assessment of the program.

This Final Assessment Report provides a summary of:

- Strengths of the programs
- Challenges faced by the programs
- Opportunities for program improvement and enhancement
- The Outcome of the Review
- The Implementation Plan

This report draws on five documents:

- The Self-study developed by members of the Institute of Environmental Science (Appendix A)
- The Report of the External Review Committee (Appendix B).
- The response and implementation plan from the Director of the Institute of Environmental Science (Appendix C)
- The Response from the Dean of the Faculty of Science (Appendix D).
- The internal discussant's recommendation report (Appendix E).

Appendix F contains brief biographies of the members of the External Review Committee.

This Final Assessment Report contains the Implementation Plan (Appendix C) developed by the Institute for Environmental and Interdisciplinary Sciences and agreed to by the Dean of Science, for the implementation of recommendations for program enhancement identified as part of the cyclical program review process.

The Implementation Plan identifies who is responsible for implementing the agreed upon recommendations, as well as the timelines for implementation and reporting.

Strengths of the programs

General

The External Reviewers' Report states that "The Bachelor of Science Honours in Environmental Science and the Bachelor of Science Major in Environmental Science are four-year degree programs, designed to develop environmental scientists who understand the complex and interdisciplinary nature of the field, for work, in academia, government or industry." They also stated that students in the program "develop the skills required to communicate environmental concepts and findings to scientific peers, co-workers, and the general public."

Faculty

Speaking with regard to faculty, the external reviewers stated: "[t]he faculty have strong expertise in the disciplines associated with the undergraduate degrees and all expressed a high degree of commitment to delivering a quality program to their undergraduate students. In our discussion with the faculty members, they seemed to be satisfied with the curriculum and direction of the Program in Environmental Sciences."

Students

Based on the External Reviewers meeting with the students, they indicated that the students spoke highly of Michelle Santoianni who "is an integral part of the Program and student experience." The External Reviewers noted that the students "provided a very positive impression of Carleton placing value on students."

Curriculum

The External Reviewers also noted that "[t]he student both had positive things to say about the classes offered in the Program, especially the courses that offered experiential learning opportunities. They spoke very highly of both the 2nd year and 3rd year field courses. The format of the 2nd year field course (Friday whole day trips) was especially appreciated."

"The Honours theses provide an opportunity for inter-departmental collaboration. We understand to that there are several projects supervised by government and industry scientists from outside Carleton. Thus, this is a strength and reflects a strong external commitment to the Environmental Sciences Program."

Opportunities for program improvement and enhancement

The External Reviewers' Report made 17 recommendations for improvement:

1. Concern: **Protecting the Program.** With no Environmental Sciences department, there is the danger that home departments may 'call back' faculty to teach core courses in their home departments. As a concern for Carleton, we recommend exploring the advantages of either creating a Department of Environmental Sciences or merging the Institute with an existing Department in order to ensure the maintenance of the Program.

2. Concern: **Program Concentrations** - We note that most undergraduate students do not choose to follow one of the prescribed areas of concentration offered by the Program. Undergraduate students may not be declaring a concentration as they are unaware of the opportunities of the concentration for graduate and career advancement. We recommend that the undergraduates be fully informed in their first year of what the (now four) concentrations entail, and opportunities each concentration provides for future graduate work and career paths.

3. Concern: **Course Learning Objectives** - We recommend that faculty and instructors revisit their course learning objectives stated in their course outlines and ensure that they are in line with the Program learning outcomes. We recommend the faculty to revisit learning outcomes in their syllabi and ensure that the course learning outcomes align with the Program learning outcomes and that the course learning outcomes state how the outcomes will be achieved.

4. Concern - **Program Road Map.** The Program road map presented on the website is not useful for navigating through the undergraduate degrees. While we understand that the Road Map is used for promotional purposes, we recommend that an updated, more accurate Road Map should be placed on the website.

5. Concern - **Experiential learning.** We recommend that Carleton should ensure the permanence of courses that offer experiential learning and continue to subsidize these courses as they offer a competitive advantage for Carleton for student recruitment and retention. Specifically, field courses and group research courses offer excellent experiential learning opportunities for students in the Program. Both students and faculty cited these courses as unique and formative experiential learning elements for the undergraduate degrees. Elements within the courses (for example, field visits that brought students in contact with federal policy makers) are additional components which make courses exceptional in the Program.

6. Concern - **Faculty workload (supervision)** - As undergraduate projects are required components of Honours undergraduate degrees, faculty supervision of undergraduate projects should be explicitly acknowledged and taken into account with respect to teaching loads.

7. Concern - **Curriculum** - We recommend the development of courses in Restoration Ecology and Indigenous ways of conducting environmental science (i.e., indigenous knowledge and community engagement).

8. Concern - **Cross Appointments**. A concern for the review team was whether Faculty Cross Appointments were protected, and that teaching staff had long-term commitments from home

departments. We were assured that this was not an issue. We recommend that a mechanism is put in place in the form of an annual review to ensure that these cross- appointments are protected.

9. Concern - **Stronger links with Departments that house required courses**. We recommend that there should be stronger links with departments that deliver required courses for the degree. Specifically, STATS 2507 was seen as a challenge as students did not see Environmental Sciences reflected in the course content. A similar challenge has been encountered with Chemistry. By establishing better communication with these departments, material in these courses could be developed to address elements of environmental science that would make the content more relevant to students in the Program without compromising course contents.

10. Concern - **Graduate Program in Environmental Sciences**. With no graduate program in Environmental Sciences, there is no natural progression for undergraduate Environmental Sciences students to continue in a multidisciplinary graduate program. We recommend the establishment of a graduate program in Environmental Sciences that includes both thesis-based options (PhD and MSc) and course-based (Masters) options.

11. Concern - **Institutional Terminology**. There exists ambiguity between the terms Programs, Departments, Institutes, Centers and Schools. We understand that some of these are legacy terms, but we recommend that some definition be established to remove ambiguity and establish their level in the university hierarchy.

12. Weakness - **Review hiring and retention practices**: We recommend that mechanisms for ensuring the retention of instructors should be implemented. This problem was highlighted when two key instructors resigned just prior to the site visit.

13. Weakness - **Co-op Program**. We recommend that more support is provided for students in the co-op stream. This should be accomplished by establishing a dedicated position in the co-op office dedicated to science student placements.

14. Opportunity- **Graduate programs**. Although listed as a Concern, we also see Graduate Programs as an opportunity for the Carleton Environmental Science Program.

- Research based graduate program (MSc and PhD) - the Program already prepares a good cadre of environmental scientist with research skills through the senior projects and Honour's thesis courses (ENSC 4906 - Honours Research Project). With no graduate program in Environmental Sciences, there is no natural progression for undergraduate Environmental Sciences students to continue in a multidisciplinary graduate program. We recommend that Carleton should consider the establishment of a graduate program in Environmental Sciences for thesis- based options (PhD and MSc)
- Course-based Masters Program- several professionals would like to enhance their credentials to advance their careers. Further, students who have just finished undergraduate degrees are often looking to expand their skill set. Consider a course-based Masters program, perhaps with online or evening course offerings, that would allow individuals maximum flexibility in obtaining advanced credentials.

15. Opportunity - **Professional Accreditation**. We recommend that students early (in the first year of the Program) in the Program be made aware of the Professional Geoscientists Ontario (PGO)

Accreditation made available through the Environmental Science with Concentration in Earth Sciences B.Sc. Honours.

16. Opportunities - **Alumni Outreach and Tracking the Program**. We recommend that Carleton conduct periodic alumni surveys and other mechanisms for tracking job outcomes for graduates, as well as other information and feedback (e.g., salary,most useful courses, potential new courses), to measure overall quality of the Program.

17. Opportunity - **New Student Recruitment**. Although there are not pressures for student recruitment at this time there may be in the future. We therefore recommend that Carleton:

- Expand links to relevant Programs at Algonquin College, and other colleges with ancillary Programs. This could include providing equivalent credits for courses and advanced standing in the Environmental Science Program.
- Provide information to High School councillors throughout your catchment area about the Environmental Science Program.
- Have current students and former alumni visit the high schools they graduated from and talk about the Program with the senior students.
- Explore expanding the catchment area for students beyond Eastern Ontario, the area that most students appear to be drawn from by promoting the "Capital Advantage".

The Outcome of the Review

As a consequence of the review, the undergraduate programs in Environmental Science were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of GOOD QUALITY (Carleton's IQAP 7.2.13).

The Implementation Plan

The recommendations that were put forward as a result of the review process were productively addressed by the Director of the Institute of Environmental Sciences and the Dean of the Faculty of Science in responses to the External Reviewers' report and Implementation Plan that was considered by SQAPC on September 9, 2021. The unit response to the recommendations is as follows:

- recommendations #6 and 9 were agreed to unconditionally
- recommendations #2, 3, 5, 14, 15, 16 and 17 were agreed to in principle
- recommendation #7 was agreed to if resources permit
- the unit did not agree to recommendations #1, 4, 8, 11, 12 and 13
- the unit had a split response to recommendation #10. Explanation as follows:
    - not agreed to: with no graduate program in Environmental Sciences, there is no natural progression for undergraduate Environmental Sciences students to continue in a multidisciplinary graduate program.
    - agreed to in principle: we recommend the establishment of a graduate program in Environmental Sciences that includes both thesis-based options (PhD and MSc) and course-based (Masters) options

It is to be noted that Carleton's IQAP provides for the monitoring of implementation plans. A monitoring report is to be submitted by the academic unit and Faculty Dean, and forwarded to SQAPC for its review June 30, 2022.

The Next Cyclical Review

The next cyclical review of the undergraduate programs in Environmental Science will be conducted during the 2025-2026 academic year.

Environmental Sciences
Unit Response to External Reviewers' Report & Implementation Plan
Programs Being Reviewed: Undergraduate Programs

Note: This document is forwarded to Senate, the Quality Council and posted on the Vice- Provost's external website.

Introduction & General Comments

Please include any general comments regarding the External Reviewers' Report.

The Institute of Environmental and Interdisciplinary Science was pleased to receive the Reviewers' very positive External Reviewers' report on May 19th 2021. This report was shared with our faculty and staff, and we are committed to the continual improvement of our programs to enhance the student, staff, and faculty experience. This document contains both a response to the External Reviewers' Report and an Implementation Plan (Section B) which have been created in consultation with the Dean. We are thankful for the review team's dedication and thoughtful input.

For each recommendation ***one*** of the following responses must be selected:

Agreed to unconditionally: used when the unit agrees to and is able to take action on the recommendation without further consultation with any other parties internal or external to the unit.
Agreed to **if additional resources permit:** used when the unit agrees with the recommendation, however action can only be taken if additional resources are made available. Units must describe the resources needed to implement the recommendation and provide an explanation demonstrating how they plan to obtain those resources. In these cases, discussions with the Deans will normally be required and therefore identified as an action item.
Agreed to in principle: used when the unit agrees with the recommendation, however action is dependent on something other than resources. Units must describe these dependencies and determine what actions, if any, will be taken.
Not agreed to: used when the unit does not agree with the recommendation and therefore will not be taking further action. A rationale must be provided to indicate why the unit does not agree (no action should be associated with this response).

Calendar Changes

If any of the action items you intend to implement will result in calendar changes, please describe what those changes will be. To submit a formal calendar change, please do so using the Courseleaf system.

UNIT RESPONSE AND IMPLEMENTATION PLAN **Programs Being Reviewed: Undergraduate programs in Environmental Sciences** **Prepared by (name/position/unit): S. Cooke**					
External Reviewer Recommendation & Categorization	**Unit Response (choose only one for each recommendation):** **1- Agreed to unconditionally** **2- Agreed to if additional resources permit (describe resources)** **3- Agreed to in principle** **4- Not agreed to** **Rationales are required for categories 2, 3 & 4**	**Action Item**	**Owner**	**Timeline**	**Will the action described require calendar changes? (Y or N)**
1. *Concern:* **Protecting the Program.** With no Environmental Sciences department, there is the danger that home departments may 'call back' faculty to teach core courses in their home departments. As a concern for Carleton, we recommend exploring the advantages of either creating a Department of Environmental Sciences or merging the Institute with an existing Department in order to ensure the maintenance of the Program.	*Not agreed to*	*A perpetual debate… re: where to position Environmental Science units within universities. The concern raised re home departments pulling back faculty to teach in those units fails to realise that teaching duties are the purview of our institute. Faculty affiliations to so called home departments are only for research and graduate student supervision. We do not have any concern in this regard and are confident that the current model of us operating as an Institute with a focus on undergraduate programming serves us, our students, and our institution the best.*	*Director and Administrator*	*No further action.*	*N*
2. Concern: **Program Concentrations.** We note that most undergraduate students do not choose to follow one of the prescribed areas of concentration offered by the Program. Undergraduate students may not be declaring a concentration as they are unaware of the opportunities of the concentration for graduate and career advancement. We recommend that the undergraduates be fully informed in their first year of what the (now four) concentrations entail, and opportunities each concentration provides for future graduate work and career paths.	*Agreed to in principle*	*Concentrations (and minors) are optional elements that students may choose to add to their degree programs, not required. Concentrations are only available to students in the Honours program, not the Major degree program. This is a limitation for some students.* *Concentrations remove elective options and replace with required courses. A disadvantage to students who transfer into the program from another degree i.e. Engineering, as the degree will require more time to complete.*	*Director and Administrator*	*Fall 2021 and moving forward*	*N*

		Concentrations are currently discussed every fall term at Science Orientation Day with new first year students and in ENSC 1500 taught by Dr. Cooke (Director, ENSC program). ENSC 1500 is offered in fall 2021 and beyond.			
3. Concern: **Course Learning Objectives.** We recommend that faculty and instructors revisit their course learning objectives stated in their course outlines and ensure that they are in line with the Program learning outcomes. We recommend the faculty to revisit learning outcomes in their syllabi and ensure that the course learning outcomes align with the Program learning outcomes and that the course learning outcomes state how the outcomes will be achieved.	*Agreed to in principle*	*Instructors review course-learning objectives regularly to ensure they meet the overall program objectives. Some flexibility is important to ensure academic freedom. We have added a number of new courses in the last few years so we will revisit syllabi and ensure they align with program learning outcomes.*	*ENSC Curriculum Committee*	*Ongoing efforts to refine our program – Unit meetings occur ~ 4 times annually. No further action.*	*N*
4. **Concern: Program Road Map.** The Program road map presented on the website is not useful for navigating through the undergraduate degrees. While we understand that the Road Map is used for promotional purposes, we recommend that an updated, more accurate Road Map should be placed on the website	*Not agreed to*	*The roadmap was as a trial run for one on campus Recruitment event in 2019. It is a recruitment tool only.* *It is not used by current students or advisors nor was that the intention. Students and Advisors follow undergraduate calendar and academic audits for degree progression information and course selections. Creating a separate map that differs from the calendar may cause confusion. We use the calendar along with individual advising to guide students.*	*Director and Administrator*	*No further action.*	*N*
5. **Concern: Experiential learning.** We recommend that Carleton should ensure the permanence of courses that offer experiential learning and continue to subsidize these courses as they offer a competitive advantage for Carleton for student recruitment and retention. Specifically, field courses and group research courses offer excellent experiential learning opportunities for students in	*Agreed to unconditionally*	*Environmental Science program offers two-field courses annually, one in second year and one in third year. Group project course is a third-year course required for all Honours students. As required core courses in the program, these courses must be offered annually.*	*Dean of Science*	*Ongoing budget support for field courses, no further action.*	*N*

	the Program. Both students and faculty cited these courses as unique and formative experiential learning elements for the undergraduate degrees. Elements within the courses (for example, field visits that brought students in contact with federal policy makers) are additional components which make courses exceptional in the Program.		*Exception-COVID in fall 2020. Could not offer the second-year field course. Third year field course and third year group project offered with adjustments for online learning.* *The Dean of Science has been extremely supportive of such programming so as long as we have budget to do so we will continue to deliver field courses.*			
6.	Concern: **Faculty workload (supervision)**. As undergraduate projects are required components of Honours undergraduate degrees, faculty supervision of undergraduate projects should be explicitly acknowledged and taken into account with respect to teaching loads.	*Agreed to unconditionally:* *Activities are already being done for this recommendation*	*Measures introduced to help faculty with thesis project workloads, include CGPA cutoff for undergraduate thesis course and an option for students to complete a directed study and 0.5 credit of coursework. Such activities are valued (and expected) as part of annual reviews needed to assess CDIs. Quite simply – we do this.*	*Director and Faculty*	*No further action.*	*N*
7.	**Concern: Curriculum.** We recommend the development of courses in Restoration Ecology and Indigenous ways of conducting environmental science (i.e., indigenous knowledge and community engagement)	*Agreed to if additional resources permit:*	*Agreement with courses in both areas, if resourced appropriately. Will discuss the possibility with our IEIS Faculty members during Fall of 2021 and then discuss with the Dean at our 2022 budget meeting.*	*Dean of Science and Director*	*No further action.*	*N*
8.	Concern: **Cross Appointments.** A concern for the review team was whether Faculty Cross Appointments were protected, and that teaching staff had long-term commitments from home departments. We were assured that this was not an issue. We recommend that a mechanism is put in place in the form of an annual review to ensure that these cross- appointments are protected	*Not agreed to*	*Standardizing terminology across Carleton, re: use of terms like cross appointments extends beyond our unit. Moreover, our cross appointments are protected – they are part of our employment contracts.*	*Director and Administrator*	*No further action.*	*N*

9. Concern: **Stronger links with Departments that house required courses.** We recommend that there should be stronger links with departments that deliver required courses for the degree. Specifically, STATS 2507 was seen as a challenge as students did not see Environmental Sciences reflected in the course content. A similar challenge has been encountered with Chemistry. By establishing better communication with these departments, material in these courses could be developed to address elements of environmental science that would make the content more relevant to students in the Program without compromising course contents.	*Agreed to unconditionally* *Activities are already being done for this recommendation*	*Communications with sisters units is important and continues to be something that we work to improve to benefit the students. There are inherent challenged in that STATS 2507 is for students across the entirety of the Faculty of Science and are not tailored to the env. However, we have our own ENSC analysis course where we dig deeper with only environmental examples.* *Our new Data Science faculty member in IEIS, Dr. Rachel Buxton, will be a link to strengthen collaborations with Math\Stats unit.*	*Director and Faculty*	*No further action.*	*N*
10. Concern: **Graduate Program in Environmental Sciences.** With no graduate program in Environmental Sciences, there is no natural progression for undergraduate Environmental Sciences students to continue in a multidisciplinary graduate program. We recommend the establishment of a graduate program in Environmental Sciences that includes both thesis-based options (PhD and MSc) and course-based (Masters) options	***Two separate comments:*** ***a) Not agreed to:*** With no graduate program in Environmental Sciences, there is no natural progression for undergraduate Environmental Sciences students to continue in a multidisciplinary graduate program. ***b) Agreed to in principle:*** We recommend the establishment of a graduate program in Environmental Sciences that includes both thesis-based options (PhD and MSc) and course-based (Masters) options	***a)*** *Environmental Science students have excellent paths\opportunities to graduate studies, should they wish to pursue them.* *First year seminar (ENSC 1500) students are introduced to ENSC faculty members, four of five faculty with established, successful (NSERC and Industry) funded research programs---stimulates ideas and discussions of where a career in science can lead too.* *Two field courses that reinforce research skills, experimental design, collaboration, professional skills-presentations, communication. Students meet industry professionals and government research scientists.* *Group project course builds on research to include, community partnerships and stakeholder engagement* *Multidisciplinary connections made with faculty in sister units while taking core courses in Biology, Chemistry, Earth Sciences, and Physical Geography.* *All of the above introduces and enlightens students to the variety of options for undergraduate thesis*	*Director*	*No further action.*	*N*

		research and graduate research areas. A natural progression does not mean that students need to stay in the same unit where they did their undergrad. Their degree opens many doors at Carleton and beyond. ***b)*** *At this time, focus is on establishment and growth of Interdisciplinary Science and Practice program (ISAP) introduced in fall 2019* *Thinking about a graduate program for many years. Needs* ***new faculty and teaching resources****. Notably, U Ottawa has a newish and very good professional degree MSc in Environmental Sustainability, which may fill this niche already.*			
11. Concern: **Institutional Terminology.** There exists ambiguity between the terms Programs, Departments, Institutes, Centers and Schools. We understand that some of these are legacy terms, but we recommend that some definition be established to remove ambiguity and establish their level in the university hierarchy	*Not agreed to*	*Standardizing terminology across Carleton, re: use of terms like Institute, Centre, Program, Department etc. extends beyond our unit.*	*Director and Administrator*	*No further action.*	*N*
12. Weakness: **Review hiring and retention practices**: We recommend that mechanisms for ensuring the retention of instructors should be implemented. This problem was highlighted when two key instructors resigned just prior to the site visit	*Not agreed to*	*The resignations of two long time contract instructors (CUPE 4600) were not unexpected. CI's had expressed their intentions in recent past. Demands of COVID* *(2020) changed situations for both CI's – one opted to retire rather than deal with online teaching and the other had ongoing child care challenges and their research activities as a Research Associate in Biology required more time.* *Teaching assignments were re-arranged.* *Planning underway to request a new faculty position to enhance collaborations with sister units in 2023.*	*Director and Administrator*	*No further action.*	*N*

13. Weakness: **Co-op Program.** We recommend that more support is provided for students in the co-op stream. This should be accomplished by establishing a dedicated position in the co-op office dedicated to science student placements	*Not agreed to*	*Co-op Department manages the co-op program and already has dedicated faculty of science program advisors.*	*Co-op Department*	*No further action.*	*N*
14. Opportunity: **Graduate programs.** Although listed as a **Concern**, we also see Graduate Programs as an opportunity for the Carleton Environmental Science Program. • Research based graduate program (MSc and PhD) - the Program already prepares a good cadre of environmental scientist with research skills through the senior projects and Honour's thesis courses (ENSC 4906 - Honours Research Project). With no graduate program in Environmental Sciences, there is no natural progression for undergraduate Environmental Sciences students to continue in a multidisciplinary graduate program. We recommend that Carleton should consider the establishment of a graduate program in Environmental Sciences for thesis- based options (PhD and MSc) • Course-based Masters Program- several professionals would like to enhance their credentials to advance their careers. Further, students who have just finished undergraduate degrees are often looking to expand their skill set. Consider a course-based Masters program, perhaps with online or evening course offerings, that would allow individuals maximum flexibility in obtaining advanced credentials	*Agreed to in principle*	*IEIS (ENSC) -Institute of Environmental and interdisciplinary Science focused on establishment and growth of Interdisciplinary Science and Practice program (ISAP) introduced in fall 2019.* *A Graduate program is a great idea with many challenges. Only if the Dean provides **new faculty teaching** resources. There is much to discuss here and if we were to go down this path it would likely be course based. However, as noted above U Ottawa already has a successful Environmental Sustainability professional MSc so that niche is already filled to some extent. Discussions with the Dean\Director will resume in 2022.*	*Director* *Dean*	*No further action.*	*N*

15. Opportunity: **Professional Accreditation.** We recommend that students early (in the first year of the Program) in the Program be made aware of the Professional Geoscientists Ontario (PGO) Accreditation made available through the Environmental Science with Concentration in Earth Sciences B.Sc. Honours	*Agreed to in principle* *Activity is already being done for this recommendation*	*Richard Amos- ENSC faculty cross appointed with Earth Sciences is PGO rep for Carleton. Introduces PGO to first year students in ENSC 1500 and teaches ENSC 2000 where he discusses PGO accreditation. Advises students in concentration in Earth Sciences.*	*ENSC Faculty- Richard Amos*	*No further action.*	*N*
16. Opportunity: **Alumni Outreach and Tracking the Program.** We recommend that Carleton conduct periodic alumni surveys and other mechanisms for tracking job outcomes for graduates,as well as other information and feedback (e.g., salary,most useful courses, potential new courses), to measure overall quality of the Program	*Agreed to in principle*	*Alumni outreach in recent years was carried out with minimal success.*	*Director and Administator*	*No further action.*	*N*
17. Opportunity: **New Student Recruitment.** Although there are not pressures for student recruitment at this time there may be in the future. We therefore recommend that Carleton: • Expand links to relevant Programs at Algonquin College, and other colleges with ancillary Programs. This could include providing equivalent credits for courses and advanced standing in the Environmental Science Program. • Provide information to High School councillors throughout your catchment area about the Environmental Science Program. • Have current students and former alumni visit the high schools they graduated from and talk about the Program with the senior students. • Explore expanding the catchment area for students beyond Eastern Ontario, the area that most students appear to be drawn from by promoting the “Capital Advantage”.	*Agreed to in principle* *Activities are already being done for this recommendation*	*- Entry\admission opportunities exist for college students. We are able to work with students to create pathways that work for them given their individual circumstances.* *-ENSC participates in Oct and March break CU Recruitment Fairs. Current students attend fairs to help promote program.* *-Faculty phone calls are completed each year.* *-Recruitment letter from the Director of ENSC emailed to prospective ENSC students with help from Undergraduate Recruitment Office.* *-Director (or designate) attends all formally organized CU Science Recruitment events incl. Ottawa and GTA Parents evenings* *-CU Recruitment Office arranges all formal high school outreach.*	*Director and Offices of Admissions Services and Undergraduat e Recruitment at Carleton.*	*No further action.*	N

CARLETON UNIVERSITY COMMITTEE ON
QUALITY ASSURANCE
Cyclical Review of the Undergraduate Programs in Earth Science

Executive Summary and Final Assessment Report

This Executive Summary and Final Assessment Report of the cyclical review of Carleton's undergraduate programs in Earth Sciences are provided pursuant to the provincial Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The undergraduate programs in Earth Science reside in the Department of Earth Science, a unit administered by the Faculty of Science.

As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The External Reviewers' report offered a very positive assessment of the programs. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the programs. These recommendations were productively addressed by the Chair of the Department of Earth Science and the Dean of the Faculty of Science in a response to the External Reviewers' report and Implementation Plan that was submitted to SQAPC on September 9, 2021.

FINAL ASSESSMENT REPORT

Introduction

The undergraduate programs in Earth Sciences reside in the Department of Earth Science, a unit administered by the Faculty of Science. This review was conducted pursuant to the Quality Assurance Framework and Carleton's Institutional Quality Process (IQAP). As a consequence of the review, the programs were categorized by Carleton University's Senate Quality Assurance and Planning Committee (SQAPC) as being of good quality. (Carleton's IQAP 7.2.13).

The site visit, which took place on January 25-27, 2021 was conducted by Dr. Jeffrey McKenzie, McGill University and Dr. Roger Beckie, University of British Columbia. The site visit involved formal meetings with the Provost, the Vice-Provost and Associate Vice-President (Academic), the Dean of the Faculty of Science, the Chair of the Department of Earth Sciences, students, faculty and staff.

The External Reviewers' report, submitted on March 19th, 2021 offered a very positive assessment of the program.

This Final Assessment Report provides a summary of:

- Strengths of the programs
- Challenges faced by the programs
- Opportunities for program improvement and enhancement
- The Outcome of the Review
- The Implementation Plan

This report draws on five documents:

- The Self-study developed by members of the Department of Earth Science (Appendix A)
- The Report of the External Review Committee (Appendix B).
- The response and implementation plan from the Chair of the Department of Earth Science (Appendix C)
- The Response from the Dean of the Faculty of Science (Appendix D).
- The internal discussant's recommendation report (Appendix E).

Appendix F contains brief biographies of the members of the External Review Committee.

This Final Assessment Report contains the Implementation Plan (Appendix C) developed by the Department of Earth Science and agreed to by the Dean of Science, for the implementation of recommendations for program enhancement identified as part of the cyclical program review process.

The Implementation Plan identifies who is responsible for implementing the agreed upon recommendations, as well as the timelines for implementation and reporting.

Strengths of the programs

General

The External Reviewers' Report states that "Carleton Earth Science is delivering high-quality undergraduate programs consistent with the institution's mission and academic plans. Based upon our interviews and review of the self-study document, student outcomes and experiences are very good. Faculty and staff are dedicated and passionate about Earth Sciences, their instructional mission, and their relationship to their research."

Faculty

Speaking with regard to faculty, the external reviewers stated: "The tenure-track faculty cover the core areas/sub-disciplines of earth sciences. They are all engaged in the programs and active scholars. They are enthusiastic and express their gratitude and good fortune to be part of Carleton Earth Sciences. There are no junior faculty, suggesting a dearth of hires in recent years, although we understand a search is underway and new positions are anticipated to maintain the core program. As such, it is not possible to gauge active mentoring, although the success of recently promoted faculty indicates that mentoring is effective.

Faculty provide personalized mentorship for undergraduates through undergraduate honours thesis and majors research projects. It seems that undergraduate supervision, while an extra load compared to faculty in other departments without theses, is enthusiastically supported by faculty in the department."

Students

The external reviewers noted "students gain from research experiences with faculty, using research tools and infrastructure. Evidence of success includes the number of students who go on to graduate studies, publications with undergraduates and conference presentations, although most of the data provided appeared to be anecdotal. In reviewing the CVs provided in the self-study document, instructors are clearly active in research, which translates to the student experience, with many students publishing research and attending conferences."

Curriculum

The external reviewers noted that the "programs have an appropriate balance of lecture, laboratory (both in the context of courses and individualize research projects) and field instruction."

They also noted that "compared to other programs, the Earth Sciences' programs stand out in a few areas":

- The program has a very strong focus on experiential learning through field courses, including international experiences. The breadth of experiences and hand-on learning provided by the program is exceptional.

- The department has excellent research facilities that are available for hands-on students use for undergraduate research projects.

- The faculty have developed cross-cutting learning outcomes for students, such as improving writing skills through exercises across numerous courses.

Opportunities for program improvement and enhancement

The External Reviewers' Report made 5 recommendations for improvement:

1. Strength and Opportunity: **Core geoscience program** - As described in the following document, the program is excellent, providing a mixture of teaching and assessment methods, outstanding experiential learning, and amble student research opportunities. In this context, we encourage the department to continue to build the earth science program.

2. Concern: **Enrollment** - As the Department is aware, they are a small unit with a narrow enrollment base. The unit is already undertaking numerous steps to address this concern, including an exemplary outreach program.

3. Strength and Opportunity: **Outreach** - There is a deep commitment by the department to earth science outreach, particularly to high school students, but also alumni and the wider community. Our sense was that there is an opportunity for the university to coordinate with and enhance departmental outreach efforts.

4. Opportunity: **Interdisciplinarity** - There are potential opportunities for the department to further engage and interact with other programs on campus. The university is prioritizing interdisciplinarity, as discussed in the Strategic Plan. The department has some obvious and existing connections to the environment, sustainability, and climate change. We encourage thinking about other opportunistic areas that are new for the discipline, interdisciplinary, and/or address grand challenges, such as data science, machine learning, and perhaps governance and policy in applied social sciences. Perhaps co-developed programs in the direction of data science may also bring in new students to the earth sciences. Other areas of potential interdisciplinarity are in evolutionary biology and geobiology, given the interest that these topics are receiving, along with potential connections to biology and evolutionary ecology.

5. Opportunity: **Enhanced indigenous and racialized engagement** – both to target indigenous students, but also to enhance student understanding of cultural, social, political aspects related to the environment and resource development in traditional territories.

Program Considerations

The following are additional suggestions presented by the external reviewers which they did not classify as mandatory program recommendations:

1. "The department should consider a peer review of teaching process to provide the quality feedback instructors need to improve. Peer review of teaching overcomes the biases and limitations of student evaluations. While student evaluations are collected routinely, the data was not provided to [the reviewers]."

2. “The department may wish to consider diversifying their program offering, building from, and not compromising their recognized expertise in core geosciences, while linking to other disciplines. This would provide research opportunities, would be aligned with Carleton’s strategic focus on interdisciplinary, and provide a broader and more stable enrolment base, less tied to the vagaries of global commodities markets.”

3. “The Department should consider if there are possibilities for joint hires related to resources, the environment, public policy, or other areas of strength at Carleton.”

The Outcome of the Review

As a consequence of the review, the undergraduate programs in Earth Sciences were categorized by Carleton University’s Senate Quality Assurance and Planning Committee (SQAPC) as being of GOOD QUALITY (Carleton's IQAP 7.2.13).

The Implementation Plan

The recommendations that were put forward as a result of the review process were productively addressed by the Chair of the School of Earth Sciences and the Dean of the Faculty of Science in a response to the External Reviewers’ report and Implementation Plan that was considered by SQAPC on September 9, 2021. The Department agreed unconditionally to recommendations #1, 2, and 5, and agreed to recommendations #3 and 4 if additional resources permit.

It is to be noted that Carleton’s IQAP provides for the monitoring of implementation plans. A monitoring report is to be submitted by the academic unit(s) and Faculty Dean(s), and forwarded to SQAPC for its review June 30th ,2023.

The Next Cyclical Review

The next cyclical review of the undergraduate programs in Earth Sciences will be conducted during the 2026-27 academic year.

Earth Sciences
Unit Response to External Reviewers' Report & Implementation Plan
Programs Being Reviewed: Undergraduate Programs

Note: This document is forwarded to Senate, the Quality Council and posted on the Vice- Provost's external website.

Introduction & General Comments

Please include any general comments regarding the External Reviewers' Report.

[Sample Text: The Department/School/Institute was pleased to receive the Reviewers' very positive External Reviewers' report on [date]. This report was shared with our faculty and staff, and we are committed to the continual improvement of our programs to enhance the student, staff, and faculty experience. This document contains both a response to the External Reviewers' Report and an Implementation Plan (Section B) which have been created in consultation with the Dean(s).

For each recommendation one of the following responses must be selected:

Agreed to unconditionally: used when the unit agrees to and is able to take action on the recommendation without further consultation with any other parties internal or external to the unit.
Agreed to **if additional resources permit:** used when the unit agrees with the recommendation, however action can only be taken if additional resources are made available. Units must describe the resources needed to implement the recommendation and provide an explanation demonstrating how they plan to obtain those resources. In these cases, discussions with the Deans will normally be required and therefore identified as an action item.
Agreed to in principle: used when the unit agrees with the recommendation, however action is dependent on something other than resources. Units must describe these dependencies and determine what actions, if any, will be taken.
Not agreed to: used when the unit does not agree with the recommendation and therefore will not be taking further action. A rationale must be provided to indicate why the unit does not agree (no action should be associated with this response).

Calendar Changes

If any of the action items you intend to implement will result in calendar changes, please describe what those changes will be. To submit a formal calendar change, please do so using the Courseleaf system.

Introduction and General Comments

The Department of Earth Sciences is extremely pleased with the feedback in the positive External Reviewers report, received on March 24, 2021. These comments have been shared with our faculty, staff and student representatives. As outlined below, we will implement the suggestions of the External Review Committee that will improve our programs and enhance the faculty/staff/student experience in our Department.

UNIT RESPONSE AND IMPLEMENTATION PLAN **Programs Being Reviewed: Earth Sciences (UG)** **Prepared by (name/position/unit):**					
External Reviewer Recommendation & Categorization	**Unit Response:** **1- Agreed to unconditionally** **2- Agreed to if additional resources permit (describe resources)** **3- Agreed to in principle** **4- Not agreed to** **Rationales are required for categories 2, 3 & 4**	**Action Item**	**Owner**	**Timeline**	**Will the action described require calendar changes? (Y or N)**
1. **Opportunity**: Core geoscience program - As described in the following document, the program is excellent, providing a mixture of teaching and assessment methods, outstanding experiential learning, and ample student research opportunities. In this context, we encourage the department to continue to build the earth science program.	*Agreed to unconditionally.*	*We will continue to identify opportunities to diversify our programs, including increasing the environmental earth sciences component of our teaching and research, expanding our Outreach programs to engage a new cohort of potential earth sciences students, developing collaborations with other departments and faculties, and expand our recruitment efforts.*	*Faculty members, staff, department Strategic Planning Committee*	*Ongoing*	*No*
2. **Concern:** Enrollment - As the Department is aware, they are a small unit with a narrow enrollment base. The unit is already undertaking numerous steps to address this concern, including an exemplary outreach program.	*Agreed to unconditionally*	*We will continue to build on our Outreach program, expand our High School teachers workshop to aid teachers in developing earth science curriculum in their courses, improve department advertising in Ontario high schools, strive to offer an Enrichment Mini-Course annually, add recruiting materials to our department website and*	*Chair, Department Recruiting Committee, Undergraduate Administrator*	*Ongoing*	*No*

		social media platforms, and expand our service course selection to attract new students.			
3. **Opportunity:** Outreach - There is a deep commitment by the department to earth science outreach, particularly to high school students, but also alumni and the wider community. Our sense was that there is an opportunity for the university to coordinate with and enhance departmental outreach efforts.	Agreed to if additional resources permit	We request a multipurpose teaching room dedicated to Outreach school visits, potentially for all Science departments. We request improvements to the outdoor area between Richcraft and Herzberg used for our Summer Sports Camps. We request the establishment of the Alice Wilson Geoheritage Park on campus. The Department/Faculty can help to better advertise and promote Geoheritage Day.	*Dean, FMP,* Chair, staff	As soon as possible – Winter 2022?	No
4. **Opportunity:** Interdisciplinarity - There are potential opportunities for the department to further engage and interact with other programs on campus. The university is prioritizing interdisciplinarity, as discussed in the Strategic Plan. The department has some obvious and existing connections to the environment, sustainability, and climate change. We encourage thinking about other opportunistic areas that are new for the discipline, interdisciplinary, and/or address grand challenges, such as data science, machine learning, and perhaps governance and policy in applied social sciences. Perhaps codeveloped programs in the direction of data science may also bring in new students to the earth sciences. Other areas of potential interdisciplinarity are in evolutionary	*Agreed to if additional resources permit*	*The department recognizes the value of collaborations with other departments and faculties. We agree that data science, computer programming, and public policy programs that exist at Carleton may be programs that our students could connect with, and also serve to attract new students into Earth Sciences from those fields. Our department experience is that new programs require faculty support – an "in-house driver" - (e.g., our Vertebrate Paleontology program) to be successful. For example, we can envision a new degree program based on a broad understanding of earth sciences coupled with other disciplines, such as history, economics, social studies, and archeology. We also see an opportunity to offer a program on Canada's North, including earth sciences,*	*Faculty, Dean*	*Ongoing*	*Yes*

biology and geobiology, given the interest that these topics are receiving, along with potential connections to biology and evolutionary ecology.		*geography, social sciences, public policy, history, and climate change – but our department currently has no expertise in the geology of the North.*			
5. **Opportunity:** Enhanced Indigenous and racialized engagement – both to target Indigenous students, but also to enhance student understanding of cultural, social, political aspects related to the environment and resource development in traditional territories.	*Agreed to unconditionally*	*We have contacted both University Advancement and the Awards Office about establishing scholarships for under-represented students, especially Indigenous students. We will work with the Centre for Indigenous Initiatives to improve communication of concerns from Indigenous groups to our students and all members of the Department. We will also approach Equity and Inclusive Communities to evaluate how to improve the diversity of our student population.*	*Faculty, staff, students, department EDI member on Faculty of Science EDI Committee*	*Ongoing*	*No*