

**YORK UNIVERSITY**

## Final Assessment Report – Executive Summary

Department of Earth and Space Science and Engineering,  
Lassonde School of Engineering

Undergraduate Programs Lassonde School of Engineering  
Cyclical Program Review – 2013-2019

Earth and Atmospheric Science  
Geomatics Engineering  
Space Engineering

and

Graduate Program in Earth and Space Science  
(MSc, and PhD)  
Cyclical Program Review – 2014 to 2019

This Final Assessment Report (FAR) provides a synthesis of the cyclical review of the programs listed below.

**Program(s) Reviewed:**

BEng (Geomatics Engineering)

BEng (Space Engineering)

BSc (Earth and Atmospheric Science)

MSc, PhD (Earth and Space Science)

Certificate in Meteorology

Certificate in Geographic Information Systems and Remote Sensing

**Reviewers appointed by the Vice-Provost Academic:**

Dr. Christopher Damaren, Professor and Director, Institute for Aerospace Studies, University of Toronto

Dr. Songnian Li, Professor, Geomatic Engineering & Associate Chair, Graduate Studies, Department of Civil Engineering, Ryerson University

Dr. Qiang Zha, Associate Professor, Faculty of Education, York University

**Cyclical Program Review Key Milestones:**

Cyclical Program Review launch: September 20, 2018

Self-study submitted to Vice-Provost Academic: December 14, 2020

Date of the Site Visit: May 3-4, 2021

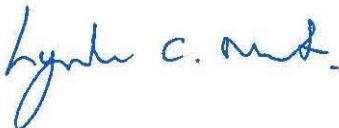
Review Report received: July 5, 2021

Program Response received: August 30, 2021

Dean's Response received: November 2021

Implementation Plan and FAR confirmed by Joint Sub-Committee on Quality Assurance, May 2022

Submitted by Lyndon Martin, Vice-Provost Academic, York University



This review was conducted under the York University Quality Assurance Protocol, August 2013.

## **SITE VISIT: May 3-4, 2021**

The visit was organized around a set of interviews with the following:

- Lyndon Martin, Vice Provost Academic
- Thomas Loebel, Dean of the Faculty of Graduate Studies
- Jane Goodyer, Dean, Lassonde School of Engineering
- John Moores, Associate Dean of Research and Graduate Studies, Lassonde
- Dan Palermo, Vice Dean, Lassonde
- Jinjun Shan, Chair & Professor of Space Engineering
- Yongsheng Chen, Undergraduate Program Director (EATS); Franz Newland, Undergraduate Program Director (SPACE); Sunil Bisnath, Undergraduate Program Director (GEOMATICS); Mark Gordon, Graduate Program Director; Michael G. Daly, CRESS Director
- Faculty Members, Undergraduate Program (EATS); Faculty Members, Undergraduate Program (Space Engineering); Faculty Members, Undergraduate Program (Geomatics Engineering); Faculty Members of Graduate Program; ESSE Staff Members
- Julie Gustavel, Operations Manager; Almey Tse Soriano, Manager of Graduate Studies; Marcia Gaynor, Graduate Program Assistant; Ian Tomaszewski, Lab Technician; Lalitha Manimurugan, Lab Technician
- Undergraduate Students (EATS); Undergraduate Students (SPACE Engineering); Undergraduate Students (GEOMATICS Engineering); Graduate Students

The following were also consulted: University Libraries: Jack Leong, Associate Dean of Research and Open Scholarship.

## **OUTCOME:**

The Joint Sub-Committee on Quality Assurance received the Final Assessment Report and Implementation plan in May 2022. The Implementation Plan was formulated based on the recommendations included in the External Review Report, received in July 2021, and the Program and Decanal responses to the review recommendations. In addition, the Work Plan for the ESSE program, developed in the year preceding the cyclical program review, included specific action items that were incorporated into the Dean's response to the External Review Report. The Dean determined that admission to two streams of the ESSE program should be suspended based on low enrolments allowing the program to focus on the renewal of the atmospheric science stream, as well as other new program options. The Implementation Plan outlines plans for enhancements to the quality of the programs in the Department and the development of new programs with a focus on student and labour market demand.

Normally a report on the progress of the initiatives undertaken in response to recommendations would be provided in a Follow-up Report which will be due 18 months after the review of this report by the York University Joint Sub-Committee on Quality Assurance. However, the Lassonde School of Engineering will launch the cyclical review for all its programs in the Fall of 2023. Significant support will be provided to programs as recommendations from reviews are examined and new self-study documents completed. External review site visits are expected to take place in Fall 2024 or Winter 2025.

While a brief follow-up report on the recommendations will be required for the Department of Earth and Space Science in Fall of 2023, the main report on progress towards the recommendations that have been accepted will be in the self-study, due in Fall 2024 or Winter 2025.

## **PROGRAM DESCRIPTION AND STRENGTHS**

The external review report provides this concise summary of the programs under review: “The Earth and Space Science and Engineering (ESSE) disciplines are multi-disciplinary, with particular focus on three major areas: Atmospheric Science and Meteorology, Geomatics Science and Engineering, and Space Science and Engineering. Specifically, the Earth and Atmospheric Science (EATS) program sets the common objective as producing scientists who can apply skills in experimental and theoretical physics, linear algebra, calculus, differential equations, and statistics to solve problems in Earth and Atmospheric Science. The Geomatics Engineering Program aims to provide world-class geospatial informatics and engineering education in the Geomatics discipline that has substantial growing demand within a wide range of real work environments across Canada and the world. The Space Engineering Program sets to train engineering students through a program founded on systems integration and instrument design and enable graduating students to tackle global engineering challenges in very harsh environments in order to benefit the whole of our global society in ways that go beyond national boundaries.”

The research-intensive graduate program in Earth and Space Science, according to the reviewers, “stands out to be a global center for interdisciplinary and transdisciplinary scholarship as a program interdisciplinary in design, combining the fields of Geomatics, Atmospheric Science, and Space Science and Engineering. The interactions between these areas of study may well lead to new interdisciplinary areas of research.”

The reviewers noted the objectives in the Geomatics Science stream and the Geomatics Engineering program, as well as the Space Science stream and the Space Engineering program should be more distinct so prospective students are clear about the differences. The reviewers also indicate that more “science” courses are needed rather than “surveying” courses and more “engineering” courses would help differentiate the programs.

The reviewers affirm that the program curriculum and structures support the program learning outcomes. The reviewers comment that the graduate program requirements

are reasonable, in spite of the earlier review that recommended more courses. However, they also note that the course requirements for the PhD are difficult to understand, although thesis requirements are clear and well monitored by the committee structure for both master's and the PhD students. Time-to-completion for graduate programs is somewhat long but not inconsistent with other comparable programs, according to the reviewers.

The reviewers acknowledge the low enrolment in courses offered as part of the various ESSE programs, at both the undergraduate and graduate level. They point to unnecessary repetition of the same material in different courses. In the graduate programs, the reviewers acknowledge the need for a suite of courses to be offered in every term. Recommendations to alleviate these issues and lessen the burden on individual full-time faculty members were identified in a previous review but have not been fully addressed.

The reviewers commented on the administrative structure of the Department and the faculty complement and make recommendations regarding this. They note that additional staff support would be helpful. The physical resources for the programs are sufficient, with well-equipped laboratories, meeting facilities and student space. The laboratory facilities have been improved since the previous review.

The reviewers note that the plan to maintain the website is crucial as it is the primary mechanism for sharing information with prospective students. They note, "The creation of the proposed YorkU Geospatial Hub is an excellent initiative. This will allow the geomatics faculty to connect with cognate areas across the university, which will lead to increased promotion of the Geomatics Science program."

The ESSE Department members, prior to finalizing the self-study document, had developed a work plan with seven recommendations for major modifications and new programs for growth. The Dean acknowledged this important work done to date and the volume of effort that will be required to make these changes. While the reviewers did not provide detailed recommendations regarding the Department's plans, the Dean, in her response to the reviewer recommendations, has incorporated the Department's plans and action items that are reflected in the Implementation Plan.

## IMPLEMENTATION PLAN

The chart below lays out the implementation plan approved by the Joint Sub-Committee at its meeting in May 2022.

	Recommendation	Action	Responsible for Follow-up	Timeline
1.	That the Department consider offering integrated undergraduate and graduate courses.	Integrated courses already exist. No further action to be taken.	n/a	n/a
2.	That ESSE find better synergies between the three majors and the streams in EATS in the BSc.	A curriculum renewal strategy should be developed and applied to undergraduate programs. Follow steps for curriculum renewal by way of a major modification of the EATS program, including a name change. Admission has been suspended to two streams in EATS, effective December 2021.	UPD and Chair Dean and Vice-Dean responsible for suspension of admission to streams.	Curriculum renewal to be initiated through 2022 and 2023 with plan to launch renewed program options in Fall 2025. Initial action in December 2021
3.	That ESSE faculty members be given credit for teaching graduate courses.	Department to re-evaluate its teaching matrix to balance faculty complement and teaching credit allocations.	Chair	To be aligned with work plan mentioned in response to recommendation 3.
4.	That the undergraduate program in Geomatics Engineering be better publicized as an option for students in the general year.	Recommendation not accepted. The Dean's Office suspension of admission to the BEng Geomatics Engineering program continues (based on low uptake).	Dean, Vice-Dean	Suspension effective December 2021
5.	That the Department proceed with development	New Certificate proposal to be developed, as per item 3 in the work plan.	Chair	To be approved for Launch in Fall 2022

	of a Mechatronics Certificate.			
6.	That experiential learning opportunities be strengthened.	Dean to support innovative development is existing and future programs	Dean's Office and Department	ongoing
7.	That a course-based professional MEng program be considered.	Department to evaluate existing graduate program delivery with view to establish a new master's program, Plan for existing graduate programs to submitted to Dean's Office.	Graduate Program Director	April 2022 for NOI for new master's program (anticipated launch in Fall 2025); Plan for existing programs – August 2022
8.	That the staffing levels (administrative and technical) be reviewed.	Ensure balance of new and existing resources to support delivery of new and existing programs. Hire a Program Support Assistant for the Department.	Vice Dean, Lassonde School of Engineering  Operations Manager	November 2021
9.	That compensation for faculty taking on administrative duties be reviewed.	Formal request for Associate Chair position to be developed by ESSE.	Vice Dean, Lassonde and Chair, ESSE Faculty Relations, York University	January 2022
10.	That students be better represented in academic governance and department planning.	ESSE to review committee structures to ensure appropriate student representation and make recommendations to the Dean's Office.	Chair	February 2022

11	That the Departmental Work Plan and Dean's responses to the recommendations included therein be fully explored.	In addition to the reviewer recommendations, various working groups and academic leads to enact the relevant recommendations from the Departmental Work Plan.	Dean, Vice-Dean, Chair ESSE, working group members	Renewed and new programs to launch Fall 2025, subject to appropriate approvals.
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