

YORK UNIVERSITY

**Final Assessment Report – Executive
Summary**

**Mathematics & Statistics, Graduate
Programs (MA, MSc, PhD)**

Faculty of Science

Cyclical Program Review – 2012 to 2020

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

Program(s) Reviewed:

MA
PhD

Reviewers appointed by the Vice-Provost Academic:

Dr. W. John Braun, Professor and Head, Department of Computer Science,
Mathematics, Physics and Statistics, University of British Columbia-Okanagan
Dr. Bei Hu, Professor and Director of MS Program, Department of Applied and
Computational Mathematics and Statistics, University of Notre Dame
Dr. Philip Kelly, Professor of Geography, Associate Dean for Research, Graduate and
Global Affairs, Faculty of Environmental & Urban Change, York University

Cyclical Program Review Key Milestones:

Cyclical Program Review launch: September 16, 2020
Self-study submitted to Vice-Provost Academic: November 12, 2021
Date of the Site Visit: March 7-9, 2022
Review Report received: May 20, 2022
Program Response received: July 21, 2022
Dean's Response received: October 24, 2022

Implementation Plan and FAR confirmed by Joint Sub-Committee on Quality Assurance,
May 2023.

A handwritten signature in blue ink that reads "Lyndon C. Martin".

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

This review was conducted under the York University Quality Assurance Protocol,
August 2020.

SITE VISIT: March 7-9, 2022

A virtual site visit for the graduate programs in the Department of Mathematics and Statistics took place in conjunction with the review of the Department's undergraduate programs as well as with the undergraduate program in Mathematics at Glendon College. Meetings for the graduate programs took place with the following individuals and groups:

- Vice-Provost Academic, Lyndon Martin
- Dean & AVP Graduate, Thomas Loebel
- Dean, Faculty of Science, Rui Wang
- Associate Dean Research and Graduate Education, Vivian Saridakis
- Associate Dean, Students, Michael Scheid
- Chair, Department of Mathematics & Statistics, Stephen Watson
- Graduate Program Director, Seyed Moghadas
- MSc Coordinator, Jianhong Wu
- Financial Engineering Coordinator, Michael Chen
- Full-time faculty members
- Part-time instructors
- Graduate students and TAs
- Administrative Staff
- Jack Leong, Associate Dean, Research and Open Scholarship, York University Libraries

OUTCOME:

The Joint Sub-Committee on Quality Assurance received the Program and Decanal responses to the recommendations and has approved an implementation plan.

A report on the progress of the initiatives undertaken in response to recommendations in general and as specified in the implementation plan will be provided in the 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 (in February 2025).

The next Cyclical Program Review will begin in the Fall of 2028 with a site visit expected in the Fall of 2029 or Winter of 2030.

PROGRAM DESCRIPTION AND STRENGTHS:

The Department of Mathematics and Statistics at the Keele Campus offers a comprehensive graduate program in several traditional and modern fields of applied mathematics, pure mathematics, and statistics. Students can graduate with the following degrees:

- Master of Arts in Applied Mathematics, Pure Mathematics, Probability, Theoretical statistics, Applied Statistics, or Data Science
- Master of Science in Applied and Industrial Mathematics
- PhD in Applied Mathematics, Pure Mathematics, or Statistics.

The MA program is designed as a 3-semester (1-year) program that can be completed by taking a specified number of required and elective courses. Students may also opt to complete a survey paper or thesis. The MSc in Applied and Industrial Mathematics is a 6-semester (2-year) program in which students are required to take four core courses and complete a Master's thesis. The PhD program contains 24 credits, 4 comprehensive exams in the area of specialization, an oral exam presenting the overall research plans and objectives, a colloquium presenting results achieved before final defence, and the oral defence of the research results and findings culminated in the form of a PhD dissertation.

In addition to these programs, MA students can participate in a course-based Graduate Diploma program in Financial Engineering offered by the Schulich School of Business.

With regard to curriculum, the reviewers note that the Applied Mathematics program incorporates the strength of the Department's mathematical biology resources, and they note that this is what sets it apart from other programs and provides students with exciting and innovative opportunities. The reviewers also suggest that the Statistics program engage with the Computer Science department, noting that such collaboration is necessary if the program is to thrive.

The reviewers state that the "Department of Mathematics and Statistics has outstanding faculty doing amazing and impactful research". They also praise the publication record of the PhD students prior to defense. They note that all the journals are top-tier and that students are winning national and international awards. The reviewers raise concerns, however, about the practice of reducing the amount of funding supplied by the Faculty of Graduate Studies when students win external awards.

An opportunity for quality enhancement identified by the reviewers is more active engagement with the Institute for Social Research, which would enhance the Statistics program, particularly at the master's level.

The reviewers offer the following five recommendations below.

IMPLEMENTATION PLAN

The chart below lays out the implementation plan approved by the Joint Sub-Committee at its meeting in May 2023.

	Recommendation	Action	Responsible for Follow-up	Timeline
1.	That a sustainable Statistical Consulting Centre be designed.	The department should discuss the initiative with the Institution for Social Research (ISR) and the Vice-President Research and Innovation after the ISR has been rechartered.	Associate Dean Graduate Education	Revisit in Fall 2023 or later.
2.	That the number of international graduate students be increased with appropriate financial support.	The Department already opted to allocate its funded international students to the 2-year MSc program. Requests can always be made to increase the quota for an exceptional student once all the spots have been filled. The department should also increase their efforts to recruit more domestic students.	Graduate Program Director, Associate Dean Graduate Education	Funding allocation decision made in January 2022. Requests for increases can be made on an ongoing basis. Discussion regarding increasing domestic recruitment to take place in Summer/Fall 2023.
3.	That a funding formula be established to support MA students completing the Financial Engineering Diploma.	The Department should commission a study of the feasibility of an MSc degree in Financial Engineering in which students would be eligible for graduate funding.	Graduate Program Director, Associate Dean Graduate Education,	Feasibility study to be conducted in 2023. Next steps dependent on outcome.

4.	That the graduate funding model be reassessed to not reduce the fellowship awarded to students who get external scholarships.	The Department should develop a plan to provide top-ups and TAs to graduate students who receive external scholarships.	Associate Dean Graduate Education, Graduate Program Director	Plan developed by end of Fall 2023.
5.	That the Faculty and Department explore agreements with international universities to enhance international student recruitment.	The Department can request increases to its international student numbers annually. Agreements with international universities for graduate student admission should be explored within York's academic regulations.	Graduate Program Director, Associate Dean Graduate Education	Requests for increases to international students can be made annually. Exploration of possible agreements to be made on an ongoing basis.