

**Final Assessment Report**  
Submitted by SUPR-G to SCAPA

<b>Program:</b>	<b>Applied Mathematics</b>	
Degrees Offered:	MSc, PhD	
Approved Fields:	Biological and Materials Physics Mathematical Biology and Dynamical Systems Symbolic Computation and Differential Equations Theoretical Physics	
External Consultants:	Dr. Brian Ingalls Department of Applied Mathematics University of Waterloo	Dr. Geneviève Gauthier Département de sciences de la décision HEC Montréal (École des hautes études commerciales de Montréal)
Internal Reviewers:	Dr. Catherine Nolan Associate Dean (Graduate Studies) Don Wright Faculty of Music	Chantal Lemire PhD student, Don Wright Faculty of Music
Date of Site Visit:	March 8 – 9, 2017	
Evaluation:	<i>Good Quality</i>	
Approved by:	<i>SUPR-G on May 15, 2017</i> <i>SCAPA on May 31, 2017</i>	

**Executive Summary**

The onsite review of the graduate program in Applied Mathematics was a positive experience for the entire review team. The external reviewers commented during the visit and in their report on the level of collegiality and mutual support shown by the faculty members and students, ensuring a high intellectual quality of the student experience. The faculty members represent a cohesive and high-performance research group who also demonstrate great commitment to their students. Program requirements are on par with competing programs, and learning outcomes are well articulated in terms of observability and measurability.

The impending establishment of the School of Mathematical Sciences (through the participation of the current Departments of Mathematics, Applied Mathematics, and Statistical and Actuarial Sciences) will strengthen ties among the three units involved and also strengthen ties to other units in the Faculty of Science. It will facilitate sharing of resources, and will offer new opportunities for collaboration across departments. There is strong support for this initiative in the Department of Applied Mathematics.

The external reviewers expressed concern about the underrepresentation of junior faculty members in the Department and restrictions on faculty recruitment. This concern is shared by the faculty and is recognized by the Dean. The reviewers are aware of the constraints on growth in faculty complements, but felt compelled to point out that this unit is poised to capitalize on existing strengths when opportunities for growth arise.

The program brief (p. 20) included a description of a major modification to the MSc, and the reviewers recommend clarifying the course requirements for the MSc, without specifically recommending the modifications presented in the brief. Following the onsite review, the Graduate Chair submitted an Addendum to the program response with a detailed description of the proposed modifications to the MSc program as well as a proposed modification to the PhD program. These proposed modifications

appear at the end of this report. These modifications will balance the existing flexibility in the program with the achievement of the Applied Mathematics learning outcomes.

**Significant Strengths of Program:**

- Outstanding faculty research profiles
- Strong network in computational life science (including the established centre, ORCCA)
- Annual graduate student conference (and undergraduate conference)
- Computational resources (e.g., SHARCNET, access to Matlab and Mathematica)

**Suggestions for improvement & Enhancement:**

- Strengthen links to other units on campus, including the Brain and Mind Institute
- Enhance graduate recruitment strategy through improvements to the program website, including updated faculty profiles
- Clarify and formalize course requirements for the MSc in Applied Mathematics
- Encourage greater student participation in professional development opportunities on campus

<b>Recommendations required for Program sustainability:</b>	Responsibility	Resources	Timeline
Encourage greater participation by students in professional development opportunities on campus	Graduate Chair	None	Ongoing
Enhance the Department website	Graduate Chair	Department	Ongoing
Formalize requirements for the course-based MSc as outlined below	Graduate Chair	None	Ongoing
Encourage greater engagement with industrial partnerships	Faculty members Graduate Chair Associate Dean	Department / Faculty	Ongoing

Proposed modifications to the coursework MSc:

- Complete 8 half courses, one of which will be a “capstone” half course devoted to the completion of an independent research paper.
- No more than 2 of the 8 half courses will be at the senior undergraduate level.
- At least 4 of the 8 half courses will be graduate courses with the AM (Applied Mathematics) designation.

Proposed modification to the thesis-based MSc:

- Thesis MSc students will also be required to take at least 4 half courses with the AM designation.

Proposed modification to the PhD:

- The Comprehensive Examination, written before the end of the first year in the program, should be converted to a milestone.