

# TWO (2) YEAR POST CYCLICAL PROGRAM REVIEW FOLLOW-UP REPORT

## PROGRAM OVERVIEW

PROGRAM	IQAP REVIEW DATE	SENATE APPROVED
MSc. Mathematics This report was approved by Senate on March 11, 2022	February 12, 2019	September 13, 2019

## PROGRESS OF RECOMMENDATIONS

RECOMMENDATION	% COMPLETE	RESPONSIBLE MEMBER/UNIT	STATUS
			IF NOT COMPLETED, PLEASE PROVIDE PROJECTED COMPLETION DATE
#1, 5, 7 - Development of the Strategic Plan for Graduate Studies	100	Dean of Graduate Studies	
#2, 4 - Contribute to the development of the institutional SEM planning with an articulation of a recruitment strategy	50	Registrar with Department	
# 3 - Developing a more flexible and comprehensive course structure in mathematics	100	Department	
#6 - Prepare a report on possible collaborations with other Northern Universities	0	Department submit to Dean	
#8 - Develop a plan for communicating with other graduate programs	100	Department	

## SUMMARY OF PROGRESS TO DATE

Since May 2019, the department has taken a number of initiatives to revise the MSc program in Mathematics. We proposed to create a new stream in our program to emphasize applied and computational mathematics. This proposal has been turned down by our PVPAR. As a result, we made changes to our thesis route and introduced the following requirements. These new requirements are as follows.

New requirements:

MATH 6100	Thesis in Mathematics	12 cr.
MATH 5066	General Topology	3 cr.
MATH 5086	Functional Analysis	3 cr.
MATH 6206	Seminar in Mathematics I	3 cr.
MATH 6207	Seminar in Mathematics II	3 cr.

OR

MATH 6100	Thesis in Mathematics	12 cr.
MATH 5236	Advanced Numerical Methods	3cr.
MATH 5246	Optimization	3cr.
MATH 6206	Seminar in Mathematics I	3 cr.
MATH 6207	Seminar in Mathematics II	3 cr.

With these new requirements, the thesis and seminars constitute 18 credits out of 24 credits. Consequently, students and their respective supervisors will have a lot of flexibility to build a program of study based on student interests. While this report was being written, a new course proposal on Computational Thinking and further adjustments to program requirements have been discussed by the department and the graduate faculty.

#1, 5, 7 - Development of the Strategic Plan for Graduate Studies

The Strategic Plan for graduate studies for 2020-2025 places a particular emphasis on increasing graduate student enrollment. One of the action items of the plan is development of an engaging, dynamic, and informative website. Among other actions, it suggests enhancing and coordinating graduate recruitment strategies and efforts across the university, and increasing graduate student funding. This, in turn, should bring more international students to Nipissing and to MSc Math in particular.

In recent years, we had a number of applications from international students which resulted in several international students being accepted to our MSc Mathematics program (currently, we have one student from Iran and one from Ghana). Unfortunately, the COVID pandemic slowed this positive momentum. For example, two students, one from Sri Lanka and one from USA, who initially accepted our latest offers, subsequently decided not to come. We hope, however, that the end of the pandemic will re-ignite the interest of international students in our program.

#3: All faculty members of the Department of Mathematics and Computer Science must work cooperatively in developing a more flexible and comprehensive course structure in mathematics.

Another objective from the Strategic Plan is to streamline delivery of graduate programming. This objective is also related to external reviewers' Recommendation #3: All faculty members of the Department of Mathematics and Computer Science must work cooperatively in developing a more flexible and comprehensive course structure in mathematics. We addressed this recommendation by changing the requirements for the thesis route in the MSc Mathematics program. Namely, we introduced graduate seminar courses (3 cr + 3 cr) and replace some of the course work requirements with the graduate seminar requirement, making the thesis route more research-oriented. Moreover, we make the other course requirements in the thesis route more flexible and more appealing to those applicants who have an undergraduate degree in areas other than mathematics (but related to mathematics, such as engineering or computer science) and/or who are looking for research projects in applied mathematics. In the near future, we also plan to re-submit a (revised) proposal for a computational stream in the MSc Mathematics program.

#2, 4 - Contribute to the development of the institutional SEM planning with an articulation of a recruitment strategy

The changes to our program requirements as outlined above are part of our departmental plan to recruit students who are interested in applied and computational mathematics. During the last 2 years, we had applications from students with backgrounds in engineering, physics, computer science and education. Currently, we have students with backgrounds in mathematical economics and engineering. We are currently working on new proposals to make the program more attractive to international students.

On the other hand, we have not been asked by any office to be involved in the development of any institutional SEM plans as a department. When such opportunity arises, we would be willing to contribute. We note that Dr. Ali Hatef served in the committee which prepared the Internationalization Plan which was approved by the Senate last spring.

#6 - Prepare a report on possible collaborations with other Northern Universities

We do not have such a report for several reasons. In order for us to work on such collaborations, we needed to establish contacts with our counterparts at Algoma, Laurentian, and Lakehead. Since the start of the pandemic in March 2020, we have been focusing on the delivery of our own courses. In addition, Laurentian University, which is closest to us, eliminated their mathematics programs and most of their mathematics faculty. Consequently, initiating any discussion on such collaborations has been postponed. Currently, as a department we are focusing on our upcoming undergraduate program reviews. Once these reviews are completed, we will have time to work on such collaborative efforts. We may need help from our administrators to start such discussions by engaging with their counterparts in Northern institutions.

#8 - Develop a plan for communicating with other graduate programs

As we indicated in our response to the reviewers' recommendations, we are always open to collaboration with other departments. In particular, we allow students from other graduate programs to take MATH graduate courses. We also encourage our students to take courses in other departments. However, communication and efforts to build such relationship must be reciprocal. We hope that other graduate programs in our institution will communicate with our department.

We note that recently we began a research collaboration with the School of Social Work. This project involves Dr. Mary Pat Sullivan (School of Social Work, Nipissing), Dr. Christina Victor (Brunel University, UK), Dr. Alex Karashev (Mathematics, Nipissing), Dr. Murat Tuncali (Mathematics, Nipissing), and Bright Effah, our graduate student. This work will constitute part of Bright Effah's Master's thesis. We expect that such collaborations will increase in the near future.

Faculty members from the Department of Computer Science and Mathematics participate in delivery of graduate courses in other programs, and in other institutions. For instance, faculty are currently involved in supervising PhD students in Mexico and Iran. Such collaborations add to our research seminars which graduate students are required to attend.

With the changes made to our thesis route requirements, we expect to create opportunities for our students to work on projects in partnership with local companies. Recently, we began a collaboration with the SafeSight Exploration, an engineering firm based in North Bay. We plan to apply for a multi-year grant from NSERC, which will help attract more graduate students and provide funding for them. It may also open opportunities for other graduate programs to collaborate on some joint projects.

## LIST OF ACTION ITEMS LEADING UP TO NEXT REVIEW

Our intention is to complete some of the initiatives we have started and make our program more flexible and attractive. We have new course proposals which should help attract students who are interested in computational mathematics and data science. In addition, when possible, we would like to work with our administration to contribute to SEM plan as well as initiate discussions to collaborate with other Northern universities.

Currently, we are focusing on our undergraduate program review. The outcome of this review is expected to inform our actions concerning our graduate program initiatives as well.

## CONCLUSIONS/RECOMMENDATIONS/NEXT STEPS – PLEASE ADD CONCLUDING SUMMARY REGARDING NEXT STEPS

We as a department took a number of steps to address the recommendations in the program review report. We will continue to work on the implementation of them as outlined above.

To address some of the recommendations such as #2, 4 and 6 we need help from the administration.

We also hope that our website will be updated as soon as possible to reflect the changes we introduced. We will be asking for website and calendar updates to reflect our program correctly.