

June 5, 2018

To: Quality Assurance Office

The Faculty of Mathematics endorses the May 2018, Two-Year Progress Report, Statistics & Actuarial Science and Quantitative Finance (MActSc, MMath and PhD in Actuarial Science, PhD in Statistics-Biostatistics, MMath and PhD in Statistics, MQF in Quantitative Finance).

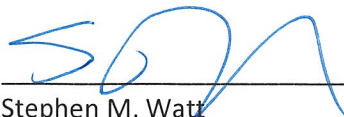
Significant progress has been made to implement the recommendations of the reviewers, with many of the recommendations now completed.

In particular, the department has now -

- implemented exit surveys for all of its finishing graduate students (recommendation 1).
- implemented a more rigorous screening process for incoming graduate students to assess their communication skills (recommendation 2).
- implemented better communication with graduate students about the TA expectations (recommendation 4).
- implemented a mentorship program for sessional instructors and new faculty (recommendations 5 and 6).
- taken steps to diversify their international student population (recommendation 8).
- become more involved with CANSSI (recommendation 9).

Recommendation 3, to provide internships for graduate students, was deemed to be infeasible, as mentioned in the initial response to the reviewers' recommendations. As such, no action has been taken on it.

Recommendation 7, to foster innovation in the classroom is already started. This project will always be ongoing as the department strives to always improve upon itself.



Stephen M. Watt
Dean, Faculty of Mathematics



Two-Year Progress Report

Statistics & Actuarial Science and Quantitative Finance, (MActSc, MMath and PhD in Actuarial Science, PhD in Statistics-Biostatistics, MMath and PhD in Statistics, MQF in Quantitative Finance)

November 2018, updated May 2019

Background:

The most recent graduate programs review for the Department of Statistics and Actuarial Science took place in 2016. The self-study was submitted January 20, 2016 and the site visit occurred April 14-15, 2016. The review team's report was received on May 19, 2016, and the program's response and implementation plan were submitted on June 6, 2016. The Dean of Mathematics indicated his endorsement of the plan on January 4, 2018. The Final Assessment Report was approved at Senate Graduate and Research Council on September 10, 2018 and at Senate on October 15, 2018.

The program reviewers were very positive about the programs. We repeat two quotes from the program reviewers' report below.

"This department is the best in Canada for both, training in statistics and in actuarial sciences."

"It is fair to say that this department has a truly outstanding track record for graduate student supervision."

Progress on Implementation Plan:

Below we list all the reviewers' recommendations and our progress on implementation.

Recommendations

1. *An exit survey to get students' feedbacks on the program they had just completed. For the professional programs (MQF and MActSc) this is implemented informally as alumni are involved in training and in mentoring the students. It might be useful in the other programs, especially the MMath programs.*

Status: Completed

Details: The Department implemented an exit survey for all finishing graduate students. It was first used in Fall 2016 and is now conducted at the end of each term for all graduating students. In 2018 we sent the survey to 74 students and received ratings/comments from 18 students (response rate ~ 25%). All students gave the program an overall rating of either excellent or good (second highest rating).

- 2. A more rigorous evaluation of the students who are candidates for the PhD program could be envisaged. This could be done by conducting a phone interview with top candidates. This would help to ascertain their communication skills; it could also provide an opportunity to promote Waterloo programs to outstanding students.*

Status: Completed

Details: All PhD students are screened by the Associate Chair for Graduate Studies based on their written applications. Information about the PhD candidates who pass this screening is posted for all faculty members to see and review. PhD students are then only admitted on the recommendation of a supervisor. As part of this process, potential supervisors are strongly encouraged to conduct a phone interview of the candidates and the Department feels that they are already meeting this recommendation.

- 3. An internship in a neighboring insurance company would benefit the students in this program. This program is already highly structured and, in informal discussions, many obstacles to the implementation of this proposal were mentioned.*

Status: Incomplete (not feasible)

Details: The Department has been considering, for a while, adding an internship to the MActSc program. This suggestion was also made by the program's advisory board consisting of industry partners. The difficulty lies in implementing the internship as the program is very demanding, with five courses per term and adding an internship parallel with an existing academic term is not feasible from a time commitment perspective. Adding an internship after two terms would result in some logistical difficulties as there would be a double cohort present on campus at the same. Additionally, since the program is designed to take strong students with little or no actuarial science background, the Department feels that they require all three academic terms to learn the background and skills needed to work in the insurance industry at the level desired by the Department. Adding one at the end is a possibility but current graduates secure employment within a few months of graduation and adding an internship at the end would not be that useful.

- 4. Teaching assistantships (TAs) are a way to fund students who are then expected to fulfill their duties diligently. TA evaluations could be improved and their results should be communicated to the TAs. Clear messages need to be sent to TAs whose work is below expectations. The Department has a TA award; the selection criteria for this award should be communicated to the graduate students. Some students believe there is lack of transparency in the selection process.*

Status: Completed/In progress

Details: The Department assembled an ad hoc committee consisting of faculty, lecturers, a graduate student and an undergraduate student to consider this issue and the roles and expectations of TAs more generally. The ad hoc committee provided a report in Fall 2016. Our newly hired instruction support staff member now provides better communication of expectations to TAs. In addition, instructors have been asked to provide timely feedback as necessary throughout the term and to flag exceptional (both good and bad) performance to the graduate officer at the end of each term. The Department is still in the process of working through a TA agreement that would detail individual TA tasks, expected time commitments, financial support and conditions of continuation. This has not been implemented to date due to revisions to Policy 30 (Employment of Graduate Student Teaching Assistants), which are close to completion.

- 5. Sessional lecturers, especially those teaching for the first time, should have a faculty mentor. The mentor could help with the content of the course material and the exams. In large courses involving TAs, the mentor could also be involved in TA supervision. Both sessional lecturers and TAs are graduate students; it might therefore be difficult for a sessional lecturer to reprimand TAs whose work is not adequate. The mentor could help with TA supervision.*

Status: Completed

Details: The Department implemented this recommendation starting in Fall 2016. We have a faculty teaching mentor who matches experienced instructors with anyone teaching a particular course for the first time. Documentation on teaching issues that are normally provided to new faculty hires are now also provided to new sessional instructors.

- 6. Mentoring is important to facilitate the integration of new faculty and to introduce them to the Waterloo tradition. This may be best accomplished by pairing them with an experienced faculty for a joint task force, say the teaching or a two-sections service course. Their integration might be facilitated by having them involved with academic committees managing the programs of the Department. They might also be given the opportunity to present their research results in a Departmental seminar, without the stress of a job interview.*

Status: Completed

Details: The Department has a formal mentoring program for new faculty.. Each new faculty member is assigned a mentor who is a more senior member of the Department, usually active in a similar research area and from a similar background (e.g. both the mentor and the mentee originate from China). Both individuals are provided with resource material that describes the mentoring process. New faculty are usually the junior partner in teaching a multiple section course in their first few terms in Waterloo. Young (pre-tenure) faculty are also assigned carefully selected service duties to help them acclimatize to the processes in the department, faculty and university. In addition, all young faculty are encouraged to give another research seminar in the regular Department seminar series or the graduate students' seminar series. We formally asked for feedback from both mentors and mentees in May 2019. We received overwhelmingly positive feedback from 8 mentees and 2 mentors. One suggestion for improvement, that we plan to adopt, is to extend the mentoring program to also include lecturers.

7. *How to define a good lecturer is not easy. They might be interested in pedagogical innovations and their implementation in the classroom. If this is so they should be given opportunities to foster their pedagogical skills and to implement innovations in the classroom, in agreement with the objectives of the program managing the course.*

Status: Ongoing

Details: The Faculty of Mathematics has been proactive in addressing the needs of the growing number of teaching faculty. A faculty ad hoc committee addressed the questions of lecturer titles, expectations, promotion requirements/rules, etc. The committee developed some faculty guidelines. However, these suggestions are not official policy, since policy changes must come from the University upper administration. Inside the Department, we have some budget allocated to financially support lecturers who wish to attend teaching related conferences to present ideas and/or workshop for continuing education. The Math Faculty also has a Teaching Fellow, selected from among the regular faculty members, whose role is to encourage innovation, celebrate excellent teaching and work one-on-one with anyone in need of improvement. The Teaching Fellow organizes many events throughout the year to highlight teaching and encourage a sharing of experiences and best practices. This includes, for example, a session every fall term where some strong experienced instructors give a sample lecture and all new instructors give short mock lectures and are given feedback.

8. *We were impressed by the diversity of graduate students. We met students from at least five different countries, including China. For the time being, lack of diversification does not seem to be an issue for the Department. Aiming for quality and putting in place rigorous mechanisms for the selection of graduate students, regardless of the country of origin, is the way to go.*

Status: Completed

Details: The Department will continue to admit best students who apply to their graduate programs, but is nonetheless committed to making Waterloo a more attractive destination for students from non-traditional countries.

9. *The new Canadian Statistical Science Institute (CANSSI) offers many opportunities for International collaborations and for networking. The Department could explore ways of becoming involved with CANSSI. It is three years old and between 6 and 9 collaborative research teams have been funded by this new program. For the time being, Waterloo involvement appears to be limited.*

Status: Complete

Details: Department members have been involved with a number of CANSSI-sponsored activities (though not the collaborative research teams) including hosting a number of CANSSI-supported conferences and workshops recently. We tried unsuccessfully to convince CANSSI to select Waterloo as its permanent home. Nonetheless, we as a Department plan to engage with CANSSI initiatives fully in the future.

Address any significant developments or initiatives that have arisen since the program review process, or that were not contemplated during the review:

n/a

Report on anything else you believe is appropriate to bring to Senate concerning this program:

n/a

Updated Implementation Plan:

	Recommendations	Proposed Follow-up	Responsibility for Leading and Resourcing (if applicable) Follow-up	Timeline for addressing Recommendation
1.	Exit survey of graduate students	Implement proposal for all MMath graduates	Carlos Mendes	Complete (started Fall 2016)
2.	Phone interviews of possible PhD students	Already done for the most part, will strongly encourage potential supervisors to do this	Paul Marriott (as associate chair graduate studies)	Complete
3.	Internship in MActSc programs	Not feasible at this time	n/a	n/a
4.	Improve communication of expectations to teaching assistants	Implement recommendation	Paul Marriott (as associate chair graduate studies)	Complete - evaluations started Fall 2016
5.	Teaching mentors for new sessional instructors	Implement recommendation	Diana Skrzydlo (as department Faculty Mentor + Development Coordinator)	Complete - started Spring 2016
6.	Enhanced mentoring of new faculty	Already in place	n/a	Complete
7.	Lecturer engagement	Partial in place already	Stefan Steiner (as department chair)	In progress and ongoing - Informal guidelines implemented Winter 2017
8.	Strategic graduate student recruitment	Continue to admit the best students available	Paul Marriott (as associate chair graduate studies)	Complete and ongoing.
9.	Improve connections with CANSSI	Encourage all faculty members to engage with CANSSI activities as makes sense for them	All faculty members	Complete and ongoing.

The Department Chair/Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.

Date of next program review: _____
Date

Signatures of Approval: _____
Chair/Director Date

Stephan Hed June 13/18

AFIW Administrative Dean/Head (For AFIW programs only) Date

Sam 2018-06-13

Faculty Dean Date

Associate Vice-President, Academic Date
(For undergraduate and augmented programs)

Jeffrey M. Cancell March 21, 2019

Associate Vice-President, Graduate Studies and Postdoctoral Affairs Date
(For graduate and augmented programs)

Checklist for SUC/SGRC Reviewer Feedback Quality Assurance Office

Two-Year Progress Report: Statistics & Actuarial Science and Quantitative Finance

Name of Reviewer: Shawn Wettig, Associate Dean of Science, Graduate Studies

Date: 11/18/2019

Does the Two-Year Progress Report:

- | | | |
|--|--|------------------------------------|
| 1. Clearly describe progress achieved on the various action items in the implementation plan? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. Explain convincingly any circumstances that would have altered the original implementation plan? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. For items that are behind schedule, propose an amended implementation schedule that is reasonable and credible? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. Address significant developments or initiatives that have arisen since the program review process, or that were not contemplated by the program review process? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

General Comments

The department has or is addressing all recommendations provided by the review with the exception of the recommendation regarding internships. The justification for not implementing this recommendation is well justified and reasonable.