ACADEMIC PROGRAM REVIEW

DEPARTMENT OF MATHEMATICS AND STATISTICS

UNIVERSITY OF VICTORIA

FINAL REPORT

Rachel Kuske
Professor and Chair
School of Mathematics
Georgia Tech, USA
rachel@math.ubc.ca

Tim Swartz
Professor
Statistics and Actuarial Science
Simon Fraser University
tim@stat.sfu.ca

Afzal Suleman
Canada Research Chair and Professor
Department of Mechanical Engineering
University of Victoria
suleman@uvic.ca

28 February 2020

SECTION I

EXECUTIVE SUMMARY

The mathematical and statistical sciences are the core to science and engineering in any university. Such a recognition naturally leads to strategic activities that strengthen theoretical foundations and connect these foundations with their applied counterparts. The results bring advantages across the educational, research, and training programs of the university, particularly in today's world where innovations in quantitative disciplines are influencing all areas of our lives. With UVic's stated goals for impact in education, research, and value to society, the opportunities within the Department of Mathematics and Statistics are plentiful.

We expect that this review will encourage a renewed commitment from the Department and all levels of the university to take full advantage of these opportunities. A forward-looking approach based on data, cooperation, and a thorough understanding of the local, national, and international setting will provide a solid ground for addressing challenges and barriers that may limit progress.

The proposed measures to improve the morale and working conditions of faculty and students in the Department of Mathematics and Statistics, put forward by the External Evaluation Committee should be considered in order to ensure that faculty and students thrive in an environment with adequate resources.

1. Strengths

Commitment and Perseverance

- The Department has demonstrated perseverance under increasing workload issues, e.g. dramatically increased EETs, as well as disappointments, such as inadequate funding for graduate student support and barriers to implement a data science program.

Demonstrated commitments to valuable undergraduate programs

- The data clearly indicate strength in math/stats undergraduate programs and core teaching across the university, even with extreme increases in demand. Both teaching and research faculty demonstrate a professional attitude toward core teaching for the university as well as the delivery of mathematics and statistics programs. These are complemented with large scale student assistance efforts. Excellent teaching faculty have been recruited, demonstrating leadership in high quality teaching together with research faculty.

Commitment to research

- Likewise success in research is commendable across the research faculty, with high success rates in NSERC funding and three CRCs in a small department. There has been demonstrated initiative and creativity for seeking and securing funding outside of NSERC, e.g. particularly for

training and collaborative programs. Faculty members have been active in running programs (workshops, conferences, etc.) on regional, national, and international scenes.

- There has been improved quality in the graduate program, with demonstrated strength in attracting and retaining strong local students. Recently the first steps towards an improved work environment are supported by some positives movements to address significant space issues and excellent progress of the equity committee, particularly related to hiring and the formation of student chapters. The department enjoys excellent support from the staff, with general faculty appreciation of their effectiveness and stability for department activities.

2. Weaknesses

- The lack of a long term action plan and strategy is impeding progress that relies on stability and continuity. A number of factors are contributing to this shortfall, including:
    - Rotating interim chair for the past three years, which hinders long term planning;
    - Limited clarity and cooperation between the department, the Dean's office, and other parts of the upper level administration. – e.g. in the areas of sustained support for high teaching demands, on equity activities, on funding opportunities, on how budget plans work, and on long term planning in general.
- The uncertainty contributes to issues in managing department climate, related to expectations and balance for teaching and research faculty.
- There is a lack of balance and synchronicity between graduate and undergraduate program courses that support student needs and interests.
- Funding for graduate students is not competitive, both internationally and within Canada.
- There is a lack of structure for recruiting and retaining postdocs within UVic, making it difficult for the department to build in this important area.
- There is definitely a lack of adequate physical space both at the undergraduate and graduate levels. The space issue needs to be addressed with some urgency. Even with the more recent measures to improve the availability of physical space, the long term neglect of addressing this issue will take considerable effort and resources.

In Section II, we expand on some of these themes, based on discussions during the Academic Program Review. We also highlight some opportunities and challenges. Based on these discussions, together with the strengths and weakness mentioned above, we summarize our recommendations.

3. Recommendations

Over-arching: Most of our recommendations need to be addressed within a LONG TERM PLAN for strategic directions, supported by intensive communication and engagement with the new Dean of Science. It is essential that the department and Dean's Office take this opportunity to develop

renewed cooperation that supports long term planning, research intensive activities, continued quality in undergraduate instruction, expansion of graduate and postdoctoral programs, and a collegial working environment. Some specific areas for attention include:

- Remove barriers and advance data science initiatives, especially modernizing courses and activities that cover future-looking topics. This needs to be done with consultation with other interested units including Computer Science.

- Rethink the hiring plan with a new strategic lens, building strengths strategically and realistically, as appropriate for the size of the department. It is not possible nor strategic that every area of the mathematical and statistical sciences have research-level strength.

- Seek engagement with units across campus, both in teaching and research: e.g. data sciences, health/life science initiatives, quantum computing, modeling, information, security, machine learning, theoretical computer science, etc.

- Continue to seek creative opportunities that support high quality graduate offerings – specific suggestions in the report below.

- Take advantage of the untapped graduate supervisory capacity with creative approaches to funding opportunities.

- Continue improvement of space, providing supports for the equivalents of mathematical sciences labs for faculty and student interactions and research activities.

- Address workload issues of teaching faculty, recognizing their great importance to the educational leadership, to the delivery of high quality instruction, and indirectly to the research mission of the department.

- Identify institutional peers and aspirational peers, both to learn from their successes and failures and to understand the competition. Collect quantitative and qualitative data on peers to inform the action plan.

The administration can support these recommendations in several ways:

- Reflect the long term strategy via stable budget allocations – recent uncertainty in this area has the Department at a tipping point between being a research intensive department and transitioning to one focused primarily on teaching.

- Recognize and incentivize the enormous teaching achievements and contributions of the department: ensure sustained support for appropriate capacity in both research and teaching.