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Curriculum Review Team

The Curriculum Review process has extended over a few years. Committee and team membership lists include all members having served on the committees/teams during parts or all of this period.

Mathematics Program review leads: Elena Braverman

Graduate Attributes, Program level outcomes: Kristine Bauer, Elena Braverman

Course Outcomes development and mapping: Alex Brudnyi, Alex de Leon, Anatoliy Swishchuk, Berndt Brenken, Chao Qiu, Cindy Sun, Claude Laflamme, Clifton Cunningham, Cristian Rios, Danny Glin, David Scollnik, Deniz Sezer, Elena Braverman, Gemai Chen, Gilad Gour, Hua Shen, Jim Stallard, JingjingWu, Joseph Ling, Keith Nicholson, Karen Seyffarth, Karoly Bezdek, Kristine Bauer, Larry Bates, Mark Bauer, Matthew Greenberg, Michael Cavers, Michaal Lamoureux, Mohammed Aiffa, Renate Scheidler, Robert Woodrow, Ryan Hamilton, Scott Robison, Thi Dinh, Tony Ware, Wenyuan Liao, Xuewen Lu, Ying Yan, Yousry Elsabrouty, Yuriy Zinchenko

Full-time faculty members teaching courses that support the program: All full-time faculty members in the Department of Mathematics and Statistics

Data analysis and Action plan: All faculty members and all sessional instructors invited to participate

Undergraduate Programs and Curriculum Committee: Kristine Bauer, Scott Robison, Cindy Sun, Mohammed Aiffa, Ryan Hamilton, Rohana Ambagaspitiya, Jim Stallard, Yuriy Zinchenko, Matthew Greenberg, Elena Braverman, Thi Dinh, Nancy Chibry, Joseph Ling, Diana Gibson (student), Jeremy Gillespie (student), Mathieu Weachter

Undergraduate Director and Chair of the Undergraduate Programs and Curriculum Committee: Nancy Chibry, Joseph Ling

Executive Summary

The new Mathematics program has recently been approved by the provincial government, and is going to be launched in Fall 2018. It will replace three existing programs – the Pure Mathematics program, the Applied Mathematics program and the Statistics program. Thus, it will play an extremely important role alongside the other two programs offered by the Department, namely, the General Mathematics program and the Actuarial Science program. It is more flexible than the three individual programs that it

the new Mathematics program brings students even closer to the graduate level research experience than the current separate programs do. In this regard, the new Mathematics and the current General Mathematics program actually drift further apart. That being said, the introduction of the new Mathematics program does involve changes that will have impacts on the General Mathematics program. We refer the readers to the General Mathematics Report for more discussions.

We do not anticipate the amalgamation of the three programs will significantly change the number of majors.

Program Outcomes:

Upon successfully completing the program, students should

1. acquire basic mathematical and statistical knowledge at a postsecondary level which is achieved by completing a core set of courses (basic knowledge);

2. master one or more specialized areas in pure or applied mathematics, or statistics, being able to solve theoretical problems in their selected areas of expertise (advanced knowledge);;

3. be well versed in creating and evaluating mathematical proofs, adopt problem solving in mathematics and statistics as a formal process applying standard techniques to solve theoretical and applied problems, being fluent in the formal language of mathematics (mathematical rigor);

4. develop the ability to model phenomena from natural or social sciences or other areas using mathematics/statistics, apply mathematical (or statistical) models in order to address practical problems from various fields in science or engineering, translate real-world problems into formal mathematical or statistical language and back (applications and modeling);

5. solve problems with mathematical and statistical techniques, demonstrate the ability to contribute to the problem solving process by displaying original ideas and creative solutions and also use software packages which aid computations, such as computer algebra packages (e.g. Maple, Mathematica, Wolfram Alpha, etc.) or statistical software packages (e.g. R, SAS, MiniTab, S-Plus, etc.) being aware of strength and limitations of computer-based tools (problem solving);

6. assess the validity or accuracy of models in mathematics and statistics, embrace that there is often more than one solution path, and that different perspectives on a problem may enhance a chance of finding a solution, accept that mathematical and statistical results are not subject to change, since the language of mathematics gives a formal proof of the validity of statements but mathematical or statistical models or constructions can be improved over time in light of new perspectives, discoveries or technology (judgment, critical thinking);

7. be able to work effectively in teams to solve problems and present their conclusions both orally and in writing, produce written papers and oral presentations using proper mathematical formalism (including the grammar of equations, symbols, graphs and charts), demonstrate

Guiding Questions

The following two guiding questions were selected not only for the new Mathematics programs, but also for the General Mathematics program and the Actuarial Science program

1. Where will students next apply the skills they acquire in this course in the context or upon completion of the new Math program?

2. What skills obtained in this course will a successful student beable to translate into a CV or resume item, or in support of a scholarship or other application?

Based on the data from the National Survey of Student Engagement, the Faculty of Science is seeking additional information regarding High-Impact Educational Practices.

1. Are High Impact Practices being used regularly in this program?
2. If not, what is preventing these practices from being used?

Developing interdisciplinary degrees, collaboration with other departments and faculties	Consider development of collaborate degree in x mathematical finance (Haskayne School of Business) x mathematical ecology (Biological Sciences) x Data Science (computer Science)	Curriculum and calendar committees, the department head, Faculty members	**2020-2023**
Address students' concerns about future employment and their preparation for the industrial job market	x Introduce capstone and accessible group project courses x Explore possibilities of industrial projects and external internships	Curriculum and calendar committees, the department head, Faculty members	**2020-2023**
In collaboration with Faculty of Science, advertise our new math program at schools	x Discuss the new program with school counsellors and teachers x Together with Faculty of Science, advertise the new program in flyers, posters and during meetings with high school students	Special committee organized for this purpose	