UNIVERSITY OF TORONTO MISSISSAUGA | Vice-Principal, Academic and Dean

Department of Mathematical & Computational Sciences

Major Modification: Adding Streams to The Mathematical Sciences Major Program

Jan. 11, 2024
Academic Affairs Committee

Current Program – undifferentiated Major

- **Mathematical Sciences – Major (ERMAJ2511)**
  - Type 2 program - admission requirements, unlimited spaces, application required

New structure – Major with streams

- Stream 1 – Mathematical Sciences – Major: Mathematics
- Stream 2 – Mathematical Sciences – Major: Applied Mathematics

New structure – Major with streams

- **Stream 1 – Mathematical Sciences – Major: Mathematics**
  - Same enrolment and completion requirements as those of current Mathematical Sciences – Major
  - Same learning outcomes as those of current Mathematical Sciences – Major
  - This stream would continue to be aimed at students with interest in mathematics or mathematics education and will continue to introduce the students to a broad range of mathematical subjects.
  - No disruption to current students.

New structure – Major with streams

- **Stream 2 – Mathematical Sciences – Major: Applied Mathematics**
  - Same enrolment requirements as Stream 1
  - Different completion requirements (but with common, core courses)
  - Shares most learning outcomes with some differences
  - A program for students who would like to complete a Mathematics Major program, but with a focus on applications of mathematics to other fields. This focus will involve applying computational and statistical tools and skills to both study and create mathematical models of concrete, real-world phenomena.

A Note on Streams

- A stream is defined as a structurally significant pathway through a program of study, that shares with other related streams a common pool of courses representing a shared foundation (i.e., the common core).
- They are unified by most of their Learning Outcomes, but are distinct in some areas
- A stream has, as a parent program: either a Major or a Specialist (i.e., we would not expect to see a Minor with streams).
- Streams are assigned their own Subject POSt code in ROSI and they are noted on the student transcript.

Quality Enhancement - Applied Mathematics

- Very common at peer institutions
- Currently, many students who would like to apply mathematics to their studies in other fields do so by enrolling in the Mathematics Minor
- The new Applied Mathematical Sciences stream will provide a new, deliberately designed program for students with this intent
- The program structure and included courses will provide the basis for application of Mathematics in many fields and contexts

Building on Faculty Research/Teaching Strength

- **"…while applications vary broadly, there is a core mathematical foundation for them. For instance, the study of Nonlinear Dynamics is equally relevant to Mathematical Biology, Epidemiology, Robotics, and Genetics. Aspects of the theory of Partial Differential Equations (PDEs) are used in all of the above, and also form the foundations for Mathematical Finance and Mathematical Imaging."**

- "…the Department of Mathematical and Computational Sciences at UTM boasts some of the best faculty in Nonlinear Analysis/Dynamics in the world. Strength in this area is illustrated in the recently opened the EDU-C "Centre for Nonlinear Analysis and Modeling" at UTM. Non-linear Analysis/Dynamics is a central element in any applied mathematics program. "

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Consultation

- **Within Mathematical and Computational Sciences**
- **Other units at UTM**
- **Other units on the three campuses of U of T**
  - Including some graduate units where this type of program would be relevant
- **The response was uniformly positive and enthusiastic**



Program Launch

- **Fall, 2024**

UNIVERSITY OF TORONTO MISSISSAUGA