MATHEMATICS AND STATISTICS

About Mathematics and Statistics

Mathematics and statistics are omnipresent in today's world of information and technology. Their theories, models, and methods are integral to the way we analyze, understand, and build the world around us. They play a key role in nearly every effort to push the boundaries of science, engineering, medicine, and social sciences, and contribute—in a major way—to solving some of the most pressing human, environmental, and economic problems of our time.

The Department of Mathematics and Statistics is one of the oldest and most distinguished of its kind in Canada. It is home to active, internationally acclaimed, and award-winning researchers in the three principal subdisciplines in the mathematical sciences.

Pure mathematics is concerned with abstract structures and concepts mainly with respect to their intrinsic and technical nature, although many areas in pure mathematics have developed from questions in science and technology. Core areas of expertise in pure mathematics include algebra, analysis, geometry, number theory, and topology.

Applied mathematics develops and utilizes advanced mathematical methods to solve problems in a broad range of applications in science, technology, engineering, computer science, and business. Core areas of expertise in applied mathematics include discrete mathematics, game theory, machine learning, graph theory, mathematical physics, numerical analysis, optimization, and probability.

Statistics is motivated by the need to extract information from data, to quantify uncertainty, and to make predictions about random phenomena. To do this effectively, sophisticated mathematical and probabilistic techniques and computational tools are needed. Core areas of expertise include Bayesian inference, biostatistics, computational statistics, extreme-value analysis, high-dimensional data modelling, multivariate analysis, and survival analysis.

Undergraduate Program Options

Our programs provide a broad and solid mathematical and statistical education that paves the way to many interesting career options in academia, government, and industry. Top students typically get admitted to prestigious graduate schools around the world and often become leaders in their areas of research in academic or industrial settings. Our graduates at all levels are in high demand in government departments, health research centers, banks, insurance and pharmaceutical companies, statistical agencies, and multinational high-technology industries.

There are two popular undergraduate streams. The **Honours** programs in Mathematics, Applied Mathematics, and Statistics (including **Joint Honours** with Physics or Computer Science) are at an advanced level for students who wish to specialize their studies in the mathematical sciences. The Honours stream is well suited for students who intend to move on to graduate school and essential for those who are envisaging research careers in the mathematical sciences. The **Major** programs in Mathematics and Statistics are less intense and more flexible, leaving room for a **Minor** or a second Major Concentration in another discipline. The Major stream is particularly suited for students whose future creative activity will involve Mathematics, Statistics, or Data Science and its applications in another area. With satisfactory performance in an appropriate selection of courses, the **Major Statistics** program can lead to the professional accreditation A.Stat. from the Statistical Society of Canada, which is regarded as the entry level requirement for a statistician practicing in Canada. Several **Joint Major** programs and a **Liberal** program are also available.

Furthermore, the Desautels Faculty of Management offers the B.Com. degree with a Major in Mathematics.

Research Opportunities

During their undergraduate degree, students in the Department of Mathematics and Statistics are encouraged to engage in research. The two main opportunities are:

- Funded summer research projects allowing students to engage in state-of-the art research with faculty members
- Opportunities for hands-on experience with data analysis offered through the Statistical Consulting Service

Internship Opportunities

Students who want to get practical experience in industry before graduation are encouraged to participate in one of the following internship programs:

- The **Internship Year in Science** (IYS) is an option offered for a duration of 8, 12, or 16 months. It is reflected on the transcript and included in the program name (Bachelor of Science – Internship Program). Eligible students usually take this program between their U2 and U3 years.
- The **Industrial Practicum** (IP) has a duration of four months and is usually carried out starting in May. It will appear as a 0-credit, Pass/Fail course on your transcript.

For more information on these opportunities, consult the Science Internships and Field Studies Office page.

Available Programs

- Mathematics Joint Honours Component (B.A.) (36 credits)
- Mathematics Major Concentration (B.A.) (46 credits)
- Mathematics Minor Concentration (B.A.) (18 credits)
- Statistics Major Concentration (B.A.) (46 credits)
- Statistics Minor Concentration (B.A.) (18 credits)

Location

Faculty of Science
Department of Mathematics and Statistics
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Telephone: 514-398-3800
Website: mcgill.ca/mathstat

Advising: Students are encouraged to contact the Department of Mathematics and Statistics to arrange for academic advising.