MATHEMATICS AND STATISTICS

About Mathematics and Statistics

The Department of Mathematics and Statistics offers programs that can be focused on applied mathematics, pure mathematics, and statistics leading to master's (M.A. or M.Sc.) and Ph.D. degrees. The research areas are:

- Algebra;
- Algebraic Geometry;
- Analysis;
- Category Theory;
- Data Science;
- Discrete Mathematics;
- Differential Geometry;
- Dynamical Systems;
- Geometric Group Theory;
- Logic;
- Mathematical Biology;
- Mathematical Economics;
- Mathematical Physics;
- Mathematics of Machine Learning;
- Number Theory;
- Numerical Analysis;
- Optimization;
- Partial Differential Equations;
- Probability;
- Statistics.

In the basic master's programs, students must choose between the thesis option and the non-thesis option, which requires a project. The Ph.D. program in Mathematics and Statistics is thesis only.

The Department's website provides extensive information on the Department and its facilities, including the research activities and research interests of individual faculty members. It also provides detailed supplementary information concerning our programs, admissions, funding of graduate students, thesis requirements, advice concerning the choice of courses, etc.

Students are urged to consult the *Institut des Sciences Mathématiques* (ISM) website, which coordinates intermediate and advanced-level graduate courses among Montreal and Quebec universities. A list of courses available under the ISM auspices can be obtained from the ISM website. The ISM also offers fellowships and promotes a variety of joint academic activities greatly enhancing the mathematical environment in Montreal and in the province of Quebec.

Mathematics and Statistics Admission Requirements and Application Procedures

Admission Requirements

In addition to the general Graduate and Postdoctoral Studies requirements, the Department requirements are as follows:

Master's Degree

The normal entrance requirement for the master's programs is a Canadian honours degree or its equivalent, with high standing, in mathematics or a closely related discipline in the case of applicants intending to concentrate in statistics or applied mathematics.

Applicants wishing to concentrate in pure mathematics should have a strong background in linear algebra, abstract algebra, and real and complex analysis.

Applicants wishing to concentrate in statistics should have a strong background in linear algebra and basic real analysis. A calculus-based course in probability and one in statistics are required, as well as some knowledge of computer programming. Some knowledge of numerical analysis and optimization is desirable.

Applicants wishing to concentrate in applied mathematics should have a strong background in most of the areas of linear algebra, analysis, differential equations, discrete mathematics, and numerical analysis. Some knowledge of computer programming is also desirable.

Students whose preparation is insufficient for the program they wish to enter may, exceptionally, be admitted to a Qualifying year.

Ph.D. Degree

A master's degree with high standing is required, in addition to the requirements listed above for the master's program. Students may transfer directly from the master's program to the Ph.D. program under certain conditions. Students without a master's degree, but with exceptionally strong undergraduate training, may be admitted directly to Ph.D. 1.

Application Procedures

McGill's online application form for graduate program candidates is available at mcgill.ca/gradapplicants/how-apply.

See University Regulations & Resources > *Graduate* > *Graduate Admissions and Application Procedures* > Application Procedures for detailed application procedures.

Additional Requirements

The items and clarifications below are additional requirements set by this department:

- Personal Statement – In the personal statement, the applicants should clearly explain their choice of preferred area(s) of research, as well as providing relevant information that will not be reflected on their transcripts.
- Research Proposal (optional) – If applicants have a specific research problem of interest that they want to pursue, they may discuss the details in the research proposal.
- Applicants in pure and applied mathematics should provide a GRE score report, if available.

For more details, please consult mcgill.ca/mathstat/graduate/prospective-students/admissions.

Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Mathematics and Statistics and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at mcgill.ca/gps/contact/graduate-program.

Information on application deadlines is available at mcgill.ca/gradapplicants/how-apply/you-apply-mcgill/application-deadlines.

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

Arts Programs in Mathematics and Statistics

- Mathematics and Statistics (Thesis) (M.A.)
- Mathematics and Statistics (Non-Thesis) (M.A.)
- Mathematics and Statistics (Ph.D.)

Science Programs in Math and Statistics

- Mathematics and Statistics (Non-Thesis) (M.Sc.) (45 credits)
- Mathematics and Statistics (Ph.D.)
- Mathematics and Statistics (Thesis) (M.Sc.) (45 credits)

Program Overview

The **Doctor of Philosophy (Ph.D.) Mathematics and Statistics** differs substantially from the master's programs in that the student must write a thesis that makes an original contribution to knowledge. The thesis topic is chosen by the student in consultation with the research supervisor. The thesis must be examined and approved by an internal examiner (usually a member of the Progress Tracking Committee), an external examiner, and the Oral Examination Committee. The student must present an oral defence of the thesis before that Committee. To submit a thesis for examination, the student must first pass the Ph.D. Qualifying Examination.

Location

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