

MATHEMATICAL SCIENCE (MSCI)

Department of Mathematics & Statistics, College of Engineering and Physical Sciences

Knowledge of Mathematics and Statistics is crucial for understanding our world. Students graduating from this program will have gained mastery of foundational mathematical and computational tools, and familiarity with a variety of advanced concepts in pure and applied mathematics and/or statistics.

Mathematical Science is the standalone major of the Bachelor of Mathematics. Students may choose one of two areas of emphasis, in either mathematics or statistics, with the freedom to choose electives to complement their studies and suit their interests.

Senior courses will allow students to combine the knowledge they have gained through their program with topics or applications of interest. This gives students the opportunity to gain experience with research, formal writing, and presentation, as well as to learn about current research in the mathematical sciences, and apply the knowledge that they have gained during the rest of their program.

Major Requirements (Honours)

This is a major within the degree: Bachelor of Mathematics.

This major cannot be combined with a minor in Mathematics, Statistics or Mathematical Science.

A total of 12.00 credits is required to complete the Major which includes at least 8.00 core credits and an additional set of 4.00 credits listed below. The remaining 8.00 credits needed to fill the 20.00 credit requirement of the Honours program are free electives.

Students have the option of selecting an Area of Emphasis in either Mathematics or Statistics within the Mathematical Science major. Each of these Areas of Emphasis are 4.00 credits and, together with the core, satisfy the Major requirements. Students are encouraged to select an Area of Emphasis, especially if they wish to continue to graduate study. If an Area of Emphasis is not declared, students must fulfill 4.00 credits of specified restricted electives, as identified below.

Students intending to apply for the Associate Statistician (A. Stat) designation from the Statistical Society of Canada are strongly encouraged to select the Statistics Area of Emphasis.

Students who do not select an Area of Emphasis are strongly encouraged to work with an advisor during course selection in order to ensure course prerequisite structures are completed to allow progression through the program.

Code	Title	Credits
CIS*1300	Programming	0.50
ENGL*1030	Effective Writing	0.50
MATH*1160	Linear Algebra I	0.50
MATH*1200	Calculus I	0.50
MATH*1210	Calculus II	0.50
MATH*2130	Numerical Methods	0.50
MATH*2200	Advanced Calculus I	0.50

MATH*4440	Case Studies in Mathematics and Statistics	0.50
STAT*1200	Probability and Chance	0.50
STAT*2040	Statistics I	0.50
STAT*2050	Statistics II	0.50
STAT*3100	Introductory Mathematical Statistics I	0.50
0.50 credits in MATH and/or STAT at the 2000 level or above		0.50
1.00 credits in MATH and/or STAT at the 3000 level or above		1.00
0.50 credits in liberal education, humanities or social sciences		0.50
4.00 credits from an Area of Emphasis or restricted electives		4.00
8.00 credits from free electives		8.00
Total Credits		20

Recommended Program Sequence

Code	Title	Credits
Semester 1		
CIS*1300	Programming	0.50
ENGL*1030	Effective Writing	0.50
MATH*1200	Calculus I	0.50
STAT*1200	Probability and Chance	0.50
0.50 electives or restricted electives		0.50
Semester 2		
MATH*1160	Linear Algebra I	0.50
MATH*1210	Calculus II	0.50
STAT*2040	Statistics I	0.50
0.50 credits in liberal education, humanities or social sciences		0.50
0.50 electives or restricted electives		0.50
Semester 3		
MATH*2200	Advanced Calculus I	0.50
STAT*2050	Statistics II ¹	0.50
1.50 electives or restricted electives		1.50
Semester 4		
MATH*2130	Numerical Methods	0.50
0.50 credits in MATH and/or STAT at the 2000 level or above		0.50
1.50 electives or restricted electives		1.50
Semester 5		
STAT*3100	Introductory Mathematical Statistics I	0.50
0.50 credits in MATH and/or STAT at the 3000 level or above		0.50
1.50 electives or restricted electives		1.50
Semester 6		
0.50 credits in MATH and/or STAT at the 3000 level or above		0.50
2.00 electives or restricted electives		2.00
Semester 7		
2.50 electives or restricted electives		2.50
Semester 8		
MATH*4440	Case Studies in Mathematics and Statistics	0.50
2.00 electives or restricted electives		2.00

¹ Students in the Mathematics Area of Emphasis should take this course in Semester 4.

Restricted Electives

Students may select one of the following:

Mathematics Area of Emphasis

Code	Title	Credits
MATH*2000	Proofs, Sets, and Numbers	0.50
MATH*2210	Advanced Calculus II	0.50
MATH*2270	Applied Differential Equations	0.50
MATH*3160	Linear Algebra II	0.50
MATH*3200	Real Analysis	0.50
1.50 credits in MATH at the 4000 level		1.50

Statistics Area of Emphasis

Code	Title	Credits
STAT*3110	Introductory Mathematical Statistics II	0.50
STAT*3210	Experimental Design	0.50
or STAT*3320	Sampling Theory with Applications	
STAT*3240	Applied Regression Analysis	0.50
STAT*4340	Statistical Inference	0.50
1.00 additional credits in STAT at 2000 level or above		1.00
1.00 credits in STAT at the 4000 level		1.00

No Area of Emphasis

If no area of emphasis is selected, the following 4.00 credits of restricted electives are required:

Code	Title	Credits
1.00 credits in MATH or STAT at the 2000 level or above		1.00
1.50 credits in MATH or STAT at the 3000 level or above		1.50
1.50 credits in MATH or STAT at the 4000 level		1.50

Minor Requirements (Honours)

This minor cannot be combined with a major or minor in Mathematics, Statistics, or Mathematical Science.

This minor is not open to students registered in the degree: Bachelor of Computing.

A total of 5.00 credits is required to complete the Minor, including:

Code	Title	Credits
CIS*1300	Programming ¹	0.50
or CIS*1500	Introduction to Programming	
MATH*1200	Calculus I ²	0.50
or MATH*1080	Elements of Calculus I	
MATH*1210	Calculus II ²	0.50
or MATH*1090	Elements of Calculus II	
MATH*1160	Linear Algebra I	0.50
STAT*2040	Statistics I	0.50
1.50 additional credits in MATH, STAT, or CIS at the 2000 level or above ³		1.50
1.00 additional credits in MATH, STAT, or CIS at the 3000 level or above		1.00

¹ CIS*1300 is recommended for those wishing to take further CIS courses.

² IPS*1500 Integrated Mathematics and Physics I can count toward this 0.50 credit.

³ CIS*2050 cannot be counted towards these credits.