STATISTICS HONOURS (B.A.) (63 CREDITS)

Offered by: Mathematics and Statistics (Faculty of Science)
Degree: Bachelor of Science; Bachelor of Arts
Program credit weight: 63

Program Description

The B.Sc.: Honours in Statistics provides training, at the honours level, in statistics, with a solid mathematical core, and basic training in computing. With a suitable selection of complementary courses, the program can focus on probability, mathematical statistics, applied statistics, actuarial science and finance, or data science. With satisfactory performance in an appropriate selection of courses, this 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.

Degree Requirements — B.Sc.

This program is offered as part of a Bachelor of Science (B.Sc.) degree.

To graduate, students must satisfy both their program requirements and their degree requirements.

- The program requirements (i.e., the specific courses that make up this program) are listed under the Course Tab (above).
- The degree requirements—including the mandatory Foundation program, appropriate degree structure, and any additional components—are outlined on the Degree Requirements page.

Students are responsible for ensuring that this program fits within the overall structure of their degree and that all degree requirements are met. Consult the Degree Planning Guide on the SOUSA website for additional guidance.

Degree Requirements — B.A. students

To be eligible for a B.A. degree, a student must fulfil all Faculty and program requirements as indicated in Degree Requirements for the Faculty of Arts.

We recommend that students consult an Arts OASIS advisor for degree planning.

Note: For information about Fall 2025 and Winter 2026 course offerings, please refer to Visual Schedule Builder. A technical issue is causing the "Terms offered" field to incorrectly report "this course is not currently offered" for many courses in the Course Catalogue.

Students may complete this program with a minimum of 60 credits or a maximum of 63 credits depending on whether or not they are required to take MATH 222 Calculus 3..

Program Prerequisites

The minimum requirement for entry into the Honours program is that the student has completed with high standing the following courses or their equivalents:

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Course	Title	Credits
MATH 133	Linear Algebra and Geometry.	3
MATH 150	Calculus A.	4
MATH 151	Calculus B.	4

In particular, MATH 150 Calculus A./MATH 151 Calculus B. and MATH 140 Calculus 1./MATH 141 Calculus 2./MATH 222 Calculus 3. are considered equivalent.

Required Courses (25-28 credits)

Students who have not completed an equivalent of MATH 222 Calculus 3. on entering the program must consult an academic adviser and take MATH 222 Calculus 3. as a required course in the first semester, increasing the total number of program credits from 60 to 63. Students who have successfully completed MATH 150 Calculus A./MATH 151 Calculus B. are not required to take MATH 222 Calculus 3..

Note: Students with limited knowledge of computer programming should take COMP 202 Foundations of Programming./COMP 204 Computer Programming for Life Sciences./COMP 208 Computer Programming for Physical Sciences and Engineering . or equivalent before COMP 250 Introduction to Computer Science.. U0 students may take COMP 202 Foundations of Programming. as a Freshman Science course; new U1 students should take one of these courses as an elective in their first semester.

Note: Students who wish to take MATH 204 Principles of Statistics 2. as a complementary course are strongly advised to take MATH 203 Principles of Statistics 1. beforehand, in their first semester or their first year.

Students who transfer to Honours in Mathematics from other programs will have credits for previous courses assigned, as appropriate, by the Department.

To be awarded the Honours degree, the student must have, at time of graduation, a CGPA of at least 3.00 in the required and complementary Mathematics courses of the program, as well as an overall CGPA of at least 3.00.

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Course	Title	Credits
COMP 250	Introduction to Computer Science.[1]	3
MATH 208	Introduction to Statistical Computing.	3
MATH 222	Calculus 3.[2]	3
MATH 247	Honours Applied Linear Algebra.[3]	3
MATH 251	Honours Algebra 2.[3]	3
MATH 255	Honours Analysis 2.	3
MATH 356	Honours Probability.	3
MATH 357	Honours Statistics.	3
MATH 470	Honours Research Project.	3
MATH 533	Regression and Analysis of Variance.	4

[1] Students with limited programming experience should take COMP 202 Foundations of Programming./COMP 204 Computer Programming for Life Sciences./COMP 208 Computer Programming for Physical Sciences and Engineering . or equivalent before COMP 250 Introduction to Computer Science..

[2] Students who have successfully completed MATH 150 Calculus A./MATH 151 Calculus B. or an equivalent of MATH 222 Calculus 3. on entering the program are not required to take MATH 222 Calculus 3..

[3] Students select either MATH 251 Honours Algebra 2. or MATH 247 Honours Applied Linear Algebra., but not both.

Complementary Courses (35 credits)

Advising notes:

Students wishing to pursue mathematical statistics in graduate school are advised to take MATH 587 Advanced Probability Theory 1. and recommended to take honours mathematics courses as complementary courses in Part II, in particular MATH 358 Honours Advanced Calculus., MATH 454 Honours Analysis 3. (preferably prior to MATH 587 Advanced Probability Theory 1.), and MATH 455 Honours Analysis 4..

Students wishing to pursue applied statistics and/or careers as statisticians in industry or government are advised to take MATH 523 Generalized Linear Models., MATH 524 Nonparametric Statistics., MATH 547 Stochastic Processes., at least one of MATH 525 Sampling Theory and Applications. and MATH 558 Design of Experiments., and as many courses as possible from Part III of the list of Complementary Courses below. Students interested in obtaining the A-Stat accreditation from the Statistical Society of Canada should discuss their course selection with the academic adviser.

Students with interest in probability are advised to choose from the following as part of their Complementary Courses:

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Course	Title	Credits
MATH 547	Stochastic Processes.	4
MATH 587	Advanced Probability Theory 1.	4
MATH 589	Advanced Probability Theory 2.	4

Students with interest in actuarial science are advised to choose from the following as part of their Complementary Courses:

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Course	Title	Credits
MATH 329	Theory of Interest.	3
MATH 430	Mathematical Finance.	3
MATH 524	Nonparametric Statistics.	4
MATH 545	Introduction to Time Series Analysis.	4
MATH 547	Stochastic Processes.	4

Students with interest in data science and machine learning are advised to choose from the following as part of their Complementary Courses:

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Course	Title	Credits
COMP 206	Introduction to Software Systems.	3
COMP 251	Algorithms and Data Structures.	3
COMP 370	Introduction to Data Science.	3
COMP 424	Artificial Intelligence.	3
COMP 551	Applied Machine Learning.	4
MATH 308	Fundamentals of Statistical Learning.	3
MATH 350	Honours Discrete Mathematics .	3
MATH 378	Nonlinear Optimization .	3
MATH 462	Machine Learning .	3
MATH 517	Honours Linear Optimization.	4
MATH 562	Theory of Machine Learning.	0-4
MATH 563	Honours Convex Optimization .	4

Part I

3 credits selected from:

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Course	Title	Credits
MATH 242	Analysis 1.	3
MATH 254	Honours Analysis 1.[1]	3

3 credits from:

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Course	Title	Credits
MATH 235	Algebra 1.	3
MATH 245	Honours Algebra 1.[1]	3

[1] It is strongly recommended that students take both MATH 245 and MATH 254.

Part II

6-11 credits in mathematics and computer science selected from:

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Course	Title	Credits
COMP 206	Introduction to Software Systems.	3
COMP 252	Honours Algorithms and Data Structures.	3
MATH 248	Honours Vector Calculus.[1]	3
MATH 325	Honours Ordinary Differential Equations.	3
MATH 350	Honours Discrete Mathematics .	3
MATH 352	Problem Seminar.	1
MATH 358	Honours Advanced Calculus.[1]	3
MATH 376	Honours Nonlinear Dynamics.	3
MATH 387	Honours Numerical Analysis.	3
MATH 397	Honours Matrix Numerical Analysis.	3
MATH 398	Honours Euclidean Geometry .	3
MATH 454	Honours Analysis 3.	3
MATH 455	Honours Analysis 4.[2]	3
MATH 458	Honours Differential Geometry.	3
MATH 466	Honours Complex Analysis.	3
MATH 475	Honours Partial Differential Equations.	3
MATH 478	Computational Methods in Applied Mathematics .	3

MATH 480	Honours Independent Study.	3
MATH 527D1	Statistical Data Science Practicum.	3
MATH 527D2	Statistical Data Science Practicum.	3

and any 500-level course offered by the Department of Mathematics and Statistics not listed in Part III below.

[1] Students can select either MATH 248 Honours Vector Calculus. or MATH 358 Honours Advanced Calculus., but not both.

[2] Students may obtain credit for both MATH 455 Honours Analysis 4. and MATH 587 Advanced Probability Theory 1..

Part III

18-23 credits in probability and statistics selected as follows:

15-23 credits selected from:

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Course	Title	Credits
MATH 204	Principles of Statistics 2.[1]	3
MATH 308	Fundamentals of Statistical Learning.	3
MATH 511	Analysis of Categorical Data.	4
MATH 523	Generalized Linear Models.	4
MATH 524	Nonparametric Statistics.	4
MATH 525	Sampling Theory and Applications.	4
MATH 545	Introduction to Time Series Analysis.	4
MATH 547	Stochastic Processes.	4
MATH 556	Mathematical Statistics 1.	4
MATH 557	Mathematical Statistics 2.	4
MATH 558	Design of Experiments.	4
MATH 559	Bayesian Theory and Methods.	4
MATH 587	Advanced Probability Theory 1.	4
MATH 589	Advanced Probability Theory 2.	4

[1] Students must take MATH 204 Principles of Statistics 2. before taking MATH 357 Honours Statistics. or MATH 533 Regression and Analysis of Variance.. Moreover, it is strongly advised to take MATH 203 Principles of Statistics 1. before taking MATH 204 Principles of Statistics 2..

0-3 credits from the following courses for which no Honours equivalent exists:

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Course	Title	Credits
MATH 329	Theory of Interest.	3
MATH 378	Nonlinear Optimization .	3
MATH 427	Statistical Quality Control.	3

0-8 credits selected from:

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Course	Title	Credits
COMP 370	Introduction to Data Science.	3
COMP 424	Artificial Intelligence.	3
COMP 451	Fundamentals of Machine Learning.	3
COMP 551	Applied Machine Learning.	4
COMP 579	Reinforcement Learning.	4
COMP 588	Probabilistic Graphical Models.	4
MATH 430	Mathematical Finance.	3
MATH 462	Machine Learning .	3
MATH 510	Quantitative Risk Management.	4
MATH 562	Theory of Machine Learning.	4
MATH 594	Topics in Mathematics and Statistics .[1]	4
MATH 598	Topics in Probability and Statistics.[1]	4

[1] Students may select either MATH 594 Topics in Mathematics and Statistics . or MATH 598 Topics in Probability and Statistics. but not both.