

Undergraduate - Bachelor of Arts Mathematics



"I'm an aerospace engineer and also work in the pharma industry. All the things I've learned here I have implemented into my work life ... What I like most is that all of my classmates work in these industries. You get the opportunity to learn from them."

- Agustín E.
Ottawa Graduate

At Ottawa University

The mathematics program at Ottawa University develops critical thinking, problem-solving, and communication skills while equipping students with calculus, algebra, geometry, statistics and computer programming for real-world success and future careers.

Careers

Mathematicians apply mathematical theory, computational techniques, algorithms, and modern technology to solve problems in business, science, engineering, and physics. Career paths include data scientists, software engineer, computer programmer, engineer, economists, finance and insurance actuarial, statisticians, teachers, physicists, astronomers, biological and other research, and government jobs.

Education and Qualifications

Most mathematics careers require at least a bachelor's degree, with graduate study or specialized training often preferred. Students develop strong reasoning, problem-solving, analytical, and communication skills to tackle complex problems, interpret data, and explain solutions clearly. The program also builds computational skills, including programming and algorithm development, while fostering creativity, critical thinking, and teamwork.

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Required Major Courses

MAT 20043 - Discrete Mathematics (3)

Offers an intuitive exposure to mathematical concepts useful in a wide variety of disciplines. The course focuses on concepts associated with propositional logic. Prerequisite: Score of 16 on math placement exam non-math track or Score of 7 on math placement exam math track or MAT 10443 Intermediate Algebra.

MAT 21044 - Calculus I (4)

First in a series of three courses that offers an intuitive approach to the major concepts and techniques of single-variable calculus. Topics include limits, continuity, derivatives of elementary functions and their application, extrema, optimization, elementary integration applications, the Fundamental Theorem of Calculus, and l'Hospital's rule. Prerequisite: Score of 16 on math-track initial placement OR a "C" or better in MAT 11143 Precalculus.

MAT 21144 - Calculus II (4)

Second course in a series of three courses that offers an intuitive approach to the major concepts and techniques of single-variable calculus. Topics covered include techniques of integration, integration applications, first-order linear and first-order separable differential equations, sequences, series, convergence tests, power series, and the calculus of parametric and polar equations. Prerequisite: A "C" or better in MAT 21044 Calculus I (or equivalent).

MAT 22043 - Linear Algebra (4)

Developmental course on the abstraction of vector spaces and linear transformations. Topics to be covered include vector spaces, linear transformations, systems of linear equations, matrices and their properties, determinants, quadratic forms, eigenvalues and eigenvectors, the Gram-Schmidt process, and the Jordan canonical form. Prerequisite: A "C" or better in MAT 21044 Calculus I (or equivalent).

MAT 30243 - Transition to Higher Mathematics (3)

Emphasizes the enhancement of the student's ability to write and comprehend mathematical proof. The course takes a rigorous look at standard methods of proof and their validity. Prerequisite: A "C" or better in both MAT 20043 Discrete Mathematics and MAT 21144 Calculus II.

MAT 31044 - Calculus III (4)

Third course in a series of three courses that offers an intuitive approach to major concepts and techniques of multi-variable calculus. Topics to be covered include differential and integral calculus of functions of several variables, partial differentiation, LaGrange multipliers, vector fields, line integrals, linear second-order differential equations and associated applications. Prerequisite: A "C" or better in MAT 21144 Calculus II.

MAT 31143 - Probability (4)

An intuitive study of calculus based probability and its application to inferential statistics. Topics covered include discrete, continuous, and bivariate random variables and their distribution, expectations, conditional expectation, Bayes' Rule, moment generating functions, covariance, variance, distributions for functions of random variables, order statistics and their distribution, correlation, and least squares regression modeling. Prerequisite: A "C" or better in MAT 21144 Calculus II (or equivalent).

MAT 32044 - Inferential Statistics (4)

Offers a calculus based intuitive treatment of inferential statistics structure. Applications include point estimation, single parameter and two-sample hypothesis testing, power, Neyman-Pearson Lemma, p-value, beta, ANOVA, randomized block analysis and design, Goodness-of-Fit, Wilcoxon Sign test, Mann-Whitney U test, Friedman Test, Kruskal-Wallis H Test, and rank correlation coefficient. Prerequisite: A "C" or better in MAT 31143 Probability (or equivalent).

MAT 33043 - Differential Equations (3)

Explores various techniques for finding solutions to first- and second-order differential equations. Topics covered include first-order differential equations, first-order systems, linear systems, nonlinear systems, Laplace Transforms, and the Runge-Kutta numerical method. Prerequisite: A "C" or better in MAT 21144 Calculus II (or equivalent).

MAT 42143 - Abstract Algebra (4)

Develops rigorous understanding of algebraic structures. Students construct and critique proof of properties concerning finite groups, finite simple groups, rings, integral domains, fields, polynomial rings, ring factorization, extension fields, finite fields, Sylow Theorems, and Lagrange's Theorem. Prerequisite: A "C" or better in MAT 30243 Transitions to Higher Mathematics.

Required to take ONE of the following courses: MAT 43443, MAT 44143m MAT 45143, OR MAT 49201

MAT 43443 - Numerical Methods (3)

Introduces numerical techniques and algorithms fundamental to scientific computer work including discussion of error, roots of equations, interpolation, systems of equations, numerical integration and methods of solution of ordinary differential equations. Prerequisite: MAT 21144 Calculus II.

MAT 44143 - Advanced Undergraduate Topics (3)

Introduces the student of mathematics to university instruction of an advanced undergraduate mathematics course. The course offered will be chosen from the following and determined by mutual consent of instructor and students with interest at point of offering. Students in the online program take Complex Analysis. Prerequisite: A "C" or better in MAT 30243 Transition to Higher Mathematics.

MAT 45143 - Introduction to Real Analysis (3)

Develops the theory of calculus carefully and rigorously from basic principles, giving the student of mathematics the ability to construct, analyze and critique mathematical proofs in analysis. Prerequisite: A "C" or better in MAT 30243 Transition to Higher Mathematics.

MAT 49201 - Integrative Seminar in Mathematics (3)

Capstone course that evaluates comprehensive knowledge of undergraduate mathematics. Assessment includes narrative from student describing his/her understanding of the program's learning objectives, comprehensive assessment of intuitive undergraduate mathematics, and a research component whereby the student submits some original mathematics. Prerequisite: Completion of all required major courses or consent of instructor.

