

Mathematics

If you love numbers and want to deepen your understanding of God’s creation through the beauty of numbers, then our mathematics department is the place for you.

Mathematics is the language and enabler of science and technology, providing us with the necessary tools for analyzing economic trends, forecasting weather, doing research in the social sciences and other disciplines, and making informed business decisions.

As a student of mathematics, you will explore the many disciplines of pure and applied mathematics—logic, number theory, calculus, algebra, topology, analysis, modelling, and numeric methods. A degree in mathematics can lead you to many different careers options, including elementary teacher, scientific researcher, civil engineer, statistician, software developer, and economist.

With senior faculty teaching at all level and small class sizes, we ensure that our students have access to the best education offered by the top teachers and researchers. Throughout the program, our students have opportunities to work on research with their professors. Our Liberal Arts and Sciences core offers an unsurpassed breadth of education to equip graduates to be leaders in their chosen professions or to continue their education in graduate school.

ID	COURSE	CREDITS
MATH 101	<p>MATH 101 - Mathematics for Business 2022-2023</p> <p>Basic concepts in mathematics with applications in business. Topics include elementary counting and probability, variables, equations and functions, interest rates, annuities, and loan calculations. The course is aimed at business students and serves to enhance a student's understanding of mathematics and its usefulness in a business environment.</p>	3
MATH 102	<p>MATH 102 - Introduction to Probability and Statistics 2022-2023</p> <p>Students will explore probability theory, descriptive and inferential statistics at an introductory level; applications are taken from a wide range of disciplines. Topics include descriptive analysis, scientific visualization, sets, permutations and combinations, probability, discrete and continuous distributions (e.g. binomial, normal, t), confidence intervals, hypothesis testing, correlation and linear regression. Not for credit towards a major, concentration, or minor in Mathematics.</p>	3
MATH 105	<p>MATH 105 - Pre-Calculus Mathematics 2022-2023</p> <p>An introduction to the tools essential for the study of calculus. Topics include algebra, trigonometry, exponents, logarithms, functions, graphs, conics, and plane analytic geometry. This course is taken by Science majors whose screening test during registration indicates they are not ready to take MATH 123.</p>	3

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MATH 108	<p>MATH 108 - Statistics for Health Students 2022-2023</p> <p>Students specializing in the field of nursing will explore applied statistics at an introductory level. The focus is on developing the conceptual aspects of the subject rather than the mathematical foundations and assumes no prerequisite except elementary algebra. Topics include descriptive statistics, probability, the normal, t-, chi-square and F-distributions, confidence intervals, hypothesis testing, correlation, and regression. Applications are directed towards health and biological studies.</p>	3
MATH 123	<p>MATH 123 - Calculus I 2022-2023</p> <p>An introduction to the basic elements of calculus and its applications to modeling solutions to quantitative and computational problems encountered in mathematics and science.</p>	3
MATH 124	<p>MATH 124 - Calculus II 2022-2023</p> <p>Transcendental functions, integration techniques, polar co-ordinates, sequences, series, and Taylor series.</p>	3
MATH 150	<p>MATH 150 - Introduction to Discrete Math 2022-2023</p> <p>An introduction to those branches of pure mathematics which are most commonly used in the study of Computing Science and/or have other practical applications. Topics include logic, proofs, switching circuits, set theory, induction, functions, languages, finite automata, combinatorics, and algebraic structures.</p>	3
MATH 190	<p>MATH 190 - Mathematics for Elementary Teachers 2022-2023</p> <p>Mathematical concepts and topics that undergird the elementary school mathematics curriculum. Topics include principles and applications of number systems, sets, equations, linear programming, geometry, and mathematical proof within a historical and societal context. It may not be used to meet a mathematics requirement in any other program. Students are responsible for checking the mathematics requirements of the school at which they intend to take their professional year, as they may be different from those required to obtain a teaching certificate.</p>	3
MATH 191	<p>MATH 191 - Mathematics, History & Culture 2022-2023</p> <p>Investigates the history of some of the principal mathematical societies, including ancient Egypt, Babylon, and Greece; pre-modern Islamic societies, India, and China; indigenous cultures; and the modern west, providing context for students' performance of arithmetic, algebra, and geometry. Students shall discover how mathematics is shaped by, and itself shapes, historical movements, philosophical positions, and issues of faith</p>	3
MATH 223	<p>MATH 223 - Calculus III 2022-2023</p> <p>Multivariate calculus. Topics include vectors, vector functions and derivatives; curves; partial and directional derivatives; Lagrange multipliers; double and triple integrals; spherical and cylindrical co-ordinates; vector integrals, Green's Theorem, and surface integrals.</p>	3

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MATH 250	<p>MATH 250 - Linear Algebra 2022-2023</p> <p>Systems of linear equations, matrices, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, diagonalization applications, and linear programming.</p>	3
MATH 310	<p>MATH 310 - Probability and Statistics 2022-2023</p> <p>A study of the fundamental principles of mathematical statistics. Topics include probability distributions and densities, expectation and moment-generating functions, functions of random variable, sampling distributions, estimation, hypothesis testing, regression and correlation, analysis of variance, nonparametric tests.</p>	3
MATH 320	<p>MATH 320 - Complex Analysis 2022-2023</p> <p>Functions of a complex variable, differentiation, analytic and elementary functions, Cauchy's theorem and contour integration, Taylor and Laurent series, residues and poles, and conformal mapping. Emphasis is placed on physical applications.</p>	3
MATH 321	<p>MATH 321 - Differential Equations 2022-2023</p> <p>First-order differential equations, linear differential equations, Laplace transforms, systems of differential equations, non-linear systems, series solutions, introduction to partial differential equations. Special emphasis is placed on applications to physics and engineering.</p>	4
MATH 323	<p>MATH 323 - Analysis 2022-2023</p> <p>Sequences and induction; convergence of sequences and series; limits, continuity, and differentiability; Riemann integrals; sequences of functions and an introduction to topology.</p>	4
MATH 330	<p>MATH 330 - Numerical Analysis 2022-2023</p> <p>This course covers numerical techniques for solving problems in applied mathematics, including error analysis, roots of equations, interpolation, numerical differentiation and integration, ordinary differential equations, matrix methods and selected topics from among: eigenvalues, approximation theory, non-linear systems, boundary-value problems, numerical solution of partial differential equations.</p>	4
MATH 333	<p>MATH 333 - Mathematics of Data Science 2022-2023</p> <p>Foundational mathematical concepts underpinning theoretical frameworks in data science that depend on linear algebra and multivariable calculus, with applications chosen from machine learning, statistical inference, and data assimilation. Possible topics include matrix decompositions, gradient and multivariate chain rule, Lagrange multipliers and constrained optimization, maximum likelihood, and Bayesian estimation.</p>	3
MATH 340	<p>MATH 340 - Discrete Structures and Computing 2022-2023</p> <p>This is a second course in the topics of pure mathematics, particularly those most commonly used in the study of Computing Science and related applications. It includes proof techniques, models</p>	3

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	of computation, formal languages, analysis of algorithms, trees and advanced general graph theory with applications, finite state and automata theory, encryption, and an elementary introduction to mathematical structures such as groups, rings, and fields.	
MATH 370	MATH 370 - Geometry 2022-2023 Finite geometries, transformations, Euclidean geometry, constructions, inverse geometry, projective geometry, non-Euclidean geometry.	3
MATH 390	MATH 390 - Number Theory 2022-2023 This course includes a study of the ideas of classical number theory, their historical development, and modern applications. Topics include divisibility and prime numbers, modular arithmetic, primality tests, primitive roots, quadratic reciprocity, Diophantine equations, continued fractions, and applications such as cryptography.	3
MATH 400	MATH 400 - Directed Studies in Mathematics 2022-2023 Students are required to produce an outline of the topic to be studied in consultation with the instructor. A course of reading and/or research is pursued according to the approved outline. Assessment may be via examination and/or a final written report.	3
MATH 409	MATH 409 - Thesis Preparation 2022-2023 In consultation with a faculty advisor students choose a mathematics topic for experiential inquiry that will develop into a senior thesis (MATH 410). Through student exploration and advisor feedback a selection of relevant readings and references are examined. A final written report is presented consisting of a detailed thesis proposal and a review of the literature.	1
MATH 410	MATH 410 - Senior Thesis 2022-2023 Student-led inquiry into a chosen area of mathematics with a final written report on the research.	2
MATH 411	MATH 411 - Senior Thesis 2022-2023 Research in a chosen area of mathematics with a final written report.	3
MATH 420	MATH 420 - Topics in Applied Mathematics 2022-2023 Possible topics could include mathematical models of social and natural phenomena, linear programming, applied mathematics in physics and astronomy, etc.	3
MATH 450	MATH 450 - Modern Algebra 2022-2023 Abstract algebra including group, field, and ring theory; algebraic systems, polynomial theory and additional topics in modern and abstract algebra as time permits.	3

