

MATHEMATICS COURSES

MATH 101 College Algebra (3)

This course can be used as a prerequisite for MATH 103 and MATH 104. This course will cover topics in algebra that are needed for future courses. Topics will include basic algebraic concepts, linear equations and systems, polynomials, rational functions, absolute values, roots, and linear, polynomial, and rational function inequalities. This course does **not** count for the Mathematical Arts general education requirement and is not offered in the Spring semester.

MATH 102 Liberal Arts Mathematics (3)

This course focuses on mathematical modeling through the use of graph theory. Topics include graphs, directed graphs, trees, matchings, and network flows. With the exception of Math 118, this course is not a prerequisite for any other course at Saint Mary's.

MATH 103 Precalculus (3)

This course is a study of polynomial, rational, exponential, logarithmic, and trigonometric functions from the symbolic, numeric, and graphical perspectives that provides a solid preparation for a college-level calculus course. Recommended for students who need a calculus course for their program of study but who are not yet ready for the calculus course. Note that if a student places below the second group, then Math 101 will be required before taking Math 103. **This course does NOT fulfill the general education MATH requirement in Data, Analysis, and Problem Solving. This course is offered during the summer term from June 19th through July 28th and also in fall semester. It is not offered spring semester.**

MATH 104 Finite Mathematics (3)

Set theory, counting techniques, probability, random variables, expected value, variance, standard deviation, and linear programming are all covered in this course.

MATH 108 Matrices and Models, Randomness and Reality (3)

Some of the most significant algorithms and technological innovations of today are built on the manipulation of data that has been encoded as matrices. Through linear algebra, we will pursue the study of basic machine learning and Markov chain models, and also see how to define qubits and quantum gates, which are the computational components of the quantum computing technology of the future. Key concepts of linear algebra, such as solving systems of linear equations, matrix invertibility, determinants, eigenvalues and eigenvectors, Markov chains, complex numbers, and orthogonality, will be covered. This course can be used as a prerequisite for Math 214.

MATH 121 FYS: How Data Shapes Our World (3)

How can data empower communities while avoiding harm? In this course, we will explore how data influences critical issues, from efforts to close the gender pay gap to addressing environmental challenges like climate change and renewable energy. Students will engage in hands-on work with real-world data to develop key quantitative skills, including evaluating evidence, interpreting statistical claims, and recognizing biases in data collection. We will investigate how flawed data, misleading statistics, and biased algorithms shape policies and impact marginalized communities. Open to all majors, this course welcomes students of all backgrounds—no advanced math skills required—just curiosity and a commitment to understanding how data can drive positive change. **Gen ed: Math (equivalent to Math 104 and 108) and can be used as a prerequisite for Math 214.**

MATH 113 Survey of Calculus (4) *Not offered Fall 2025*

One semester survey of differential and integral calculus designed primarily for liberal arts students and those in the professional programs. Limits are treated intuitively. Emphasis on applications in biology, economics, and other disciplines. This course can be used as a prerequisite for MATH 214.

MATH 131 Calculus I (4)

This course covers algebraic and transcendental functions, limits, continuity, derivatives, maxima and minima, concavity, related rates, Mean Value Theorem, anti-differentiation, Riemann sums, the Fundamental Theorem of Calculus. The course is based on graphical, numerical, and symbolic points of view. Graphing calculators are used throughout the course. **Note:** There is a problem session offered for this course every Wednesday at the same time as the class is taught on Monday. The problem session is optional, but it is highly recommended that students keep this time free in their schedules so that they may attend the problem session.

MATH 133 Theory and Application of Calculus (4)

This course is designed for students who have completed a full year of calculus in high school at the AP or equivalent level and have mastered the mechanics of differentiation and integration. Students who have taken the Math AP AB Exam should have a score of at least a 4¹. Students who have not taken the AP test should have two semesters of calculus at or above the AP level in high school and at least a 680 on the Math SAT or a 29 on the Math ACT. The basic concepts of calculus, including limits, derivatives, integrals, sequences, and series, will be explored in depth. The content of a full-year college-level calculus sequence is included in this one-semester course. The emphasis of the course is on understanding the theory of calculus and constructing mathematical models. Graphing calculators are used throughout the course. It is typically followed by MATH 231 (<https://catalog.saintmarys.edu/search/?P=MATH%20231>) Calculus III. **Note:** There is a problem session offered for this course every Wednesday at the same time as the class is taught on Monday. The problem session is optional, but it is highly recommended that students keep this time free in their schedules so that they may attend the problem session. ***This course is offered only in the fall semester. Students who are placed into Math 133 and earn a grade of C or higher are eligible to receive credit for Math 131 Calculus I.***