

MATHEMATICAL ARTS

If you wish to select a mathematics course for the first semester, the following courses are offered. Suggestions for the appropriate course according to high school background, aptitude, interests, and performance on the math placement test are given with each description.

The Mathematics department will determine a recommended math course placement based on your scores and previous math experience. Questions related to placement should be sent to mathplacement@saintmarys.edu (mathplacement@saintmarys.edu).

The following outlines the placement process. Note that if you are placed in to a particular group you are eligible to take all of the courses within that group and all courses in groups with a lower number. The department offers a placement exam as a means of qualifying for certain courses in the event that a student does not meet any of the other qualifying criteria. These exams are not required for all students.

Placement Process

Group 1 Courses: Math 101, Math 102

No placement requirements

Group 2 Courses: Math 103, Math 104

Placement requirements - one of the following:

- Precalculus or equivalent in high school
- College credit for a course equivalent to Math 101
- 560 or better on Math SAT
- 23 or better on the Math ACT
- 70% or better on the Algebra placement exam

Group 3 Courses: Math 113, Math 114, Math 131

Placement requirements - one of the following:

- Calculus or equivalent in high school
- College credit for the equivalent of Math 103
- Precalculus or the equivalent in high school and 620 or better on the Math SAT
- Precalculus or the equivalent in high school and 26 or better on the MATH ACT
- Precalculus or the equivalent in high school and 70% or better on the Precalculus placement exam

Group 4 Courses: Math 132, Math 133

Placement requirements - one of the following:

- College credit for the equivalent of Math 131
- 4 or better on the Calculus AB AP exam
- Calculus in high school and 680 or better on the Math SAT
- Calculus in high school and 29 or higher on the Math ACT

Students wishing to enroll in a calculus course (MATH 113 Survey of Calculus, MATH 131 Calculus I) that are in need of more preparation (as shown by previous academic background and performance on the math placement test) must successfully complete MATH 103 Precalculus before enrolling. Note that MATH 101 may be required to take MATH 103 if a student places at that level.

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 fulfill the Sophia Program requirement in Mathematical Arts.**

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 Sophia Program requirement in Mathematical Arts. This course is offered during the summer term from June 24th through August 5th 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 113 Survey of Calculus (4)

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.

MATH 114 Introduction to Statistics (3)

This course is currently being offered in the Fall, Spring and Summer semesters. Introduction to basic sampling and experimental design. Basics of probability, random variables, and probability distributions. Sampling distributions. Estimation and hypothesis testing for means and proportions. Statistical software will be used. Prerequisite: MATH 104 or MATH 113 or equivalent. **This course does not fulfill the Sophia Program requirement in Mathematical Arts.**

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 132 Calculus II (4)

This is the continuation of Calculus I. It includes the techniques of integration, applications of the integral, and sequences and series. 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. Students should register for this course as a first math course only if they have credit for

Calculus I or placed into the course. ***This course does not fulfill the Sophia Program requirement in Mathematical Arts. However, students who have the equivalent of two semesters of AP calculus in high school with strong supporting test scores may be placed into MATH 132 in consultation with the Math Placement Advisor. Students who are placed into MATH 132 and earn a grade of C or higher are eligible to receive credit for MATH 131 Calculus I.***

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 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.***