MATHEMATICS (MATH)

CHOOSING YOUR FIRST MATHEMATICS COURSE

It is important that you begin your mathematics sequence at the appropriate level for which you are qualified. You need to know your initial mathematics placement and exit requirement for your program. If you do not know your initial placement, contact Mary Stella Van Waes, the mathematics liaison. Following are the different options if you have been placed at, below, or above your program's mathematics exit requirement.

- If you have been placed at your program's exit requirement, then take that mathematics course as specified in the college catalog.
- If you have been placed below your program's exit requirement, then take that mathematics course and then progress through the mathematics sequence to the mathematics course listed as the exit requirement.
- If you have been placed above your program's exit requirement, then work with your academic advisor to find an appropriate course for your major and mathematics ability.

SUNY GENERAL EDUCATION

Students who successfully complete any course with the MATH subject code will fulfill the SUNY General Education requirement for Mathematics and Quantitative Reasoning.

Mathematics Pathways

Algebra: SKLS 091/MAGN 101/MATH 102/MATH 103

Calculus: MATH 147/MATH 161/MATH 162/MATH 261/MATH 262 OR MATH 151/MATH 152

Quantitative Reasoning: SKLS 091/MAGN 107/MATH 127

Statistical Reasoning: SKLS 091/MAGN 101/MATH 123 OR SKLS 091/MAGN 107/MATH 123

The above information does not include mathematics electives. Unless otherwise noted, a student must complete a course with a C or better to meet the pre-requisite for the next course in the sequence. Any student who passes a math course with a C or better may not take a course lower in the sequence to receive mathematics credit. If a student elects to take a mathematics course as Pass/Not Pass, a grade of pass does not imply that a student is able to progress in the sequence. In order to progress in the sequence, the numeric grade will be used to determine if the student has met the prerequisite.

MATHEMATICS COURSE ELECTIVES

MATH 123 Elementary Statistics: Prerequisite: MAGN 101 (C or better) or MAGN 106 (C or better) or MAGN 107 (C or better) or placement into MATH 102 or higher

MATH 141 Statistics: Prerequisite: MATH 102 (C or better) or placement into MATH 103 or higher

MATH 145 Discrete Mathematics: Prerequisite: MATH 102 (C or better) or placement into MATH 103 or higher

MATH 149 Elementary Linear Algebra: Prerequisite: MATH 103 (C or better) or placement into MATH 147 or higher

Transfer/Placement Information

Transfer credit: College mathematics courses taken at other institutions are evaluated and will be awarded transfer credit when appropriate.

How students are initially placed in a mathematics course

All incoming students are required to take a mandatory placement exam.* In addition to the result on the placement exam, other factors that may be considered include: high school grade point average, high school mathematics grades, examinations (regents, state, SAT, or ACT), the number of attempts necessary to successfully complete high school mathematics courses, and the time elapsed since a student's last mathematics course.

In some cases, college mathematics courses taken at other institutions and successfully transferred for credit may be considered in lieu of the placement exam.

How to find a student's mathematics placement/other questions

If a student's mathematics placement is needed, or if students or advisors have any other questions about mathematics placement, please contact the math liaison.

Changes to Placement

If a student feels their math placement is not correct, they may schedule a meeting with the math liaison during the first week of classes to have their placement reevaluated.

SKLS 091 - PRE-ALGEBRA

(see Skills Courses)

MATH 102. Intermediate Algebra w Trig. (3 Credits)
Topics include: Exponents, roots, and radicals; Functions and their graphs; Solving and graphing quadratic equations and applications; Solving, radical, equations; Equations in quadratic form; General angle trigonometry; Solving systems of linear equations in two or three variables and applications. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Prerequisite: MAGN 101 (C or better required) or MAGN 107 (B or better required) or equivalent, or placement into MATH 102 or MATH 127. 3 credits (online or lecture format), fall or spring semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 103. College Algebra w/ Trig. (3 Credits)
Topics include: Complex fractions; Evaluation and combinations of functions, inverse functions, exponential, and logarithmic functions, including applications; General angle trigonometry in radian measure; Graphs of basic trigonometric functions; Transformations of sine and cosine functions; Trigonometric identities and equations; Law of sines and law of cosines, including applications. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Prerequisite: MATH 102 (C or better required) or equivalent, or placement into MATH 103. 3 credits (3 lecture hours), fall or spring semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 123. Elementary Statistics. (3 Credits)
Topics include: Study design and Sampling methods; Graphical representation of data; Descriptive statistics; Normal distribution; Hypothesis testing; Confidence intervals; Nonparametric techniques; t-tests; Correlation and regression. Chi-Square Applications in the healthcare and life science professions will be emphasized. Excel will be used for calculations and analysis. Students may not take MATH 123 if credit has been received for MATH 141, or equivalent, without permission from instructor. Prerequisites: MAGN 101 (C or better), MAGN 106 (C or better), or MAGN 107 (C or better) or equivalent, or placement into MATH 102, MATH 103, MATH 127, MATH 147, or MATH 151. 3 credits (hybrid or lecture format). This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 127. Mathematical Reasoning. (3 Credits)
This course will explore various applications of mathematics in the social, finance, health, and environmental fields with a focus of developing informational, technological, logical, and visual reasoning skills. Topics from numeracy, probability and statistics, finance, mathematical modeling with linear, statistical, and exponential functions, and other areas of mathematics will be covered. (TI-30XII calculator required). Prerequisite: MAGN 101 (C or better), MAGN 106 (C or better), or MAGN 107 (C or better) or placement into MATH 102, MATH 103, MATH 127, MATH 147, or MATH 151. 3 credits, (3 lecture hours) fall or spring semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 141. Statistics. (3 Credits)
Topics include: Graphical representations, Measures of central tendency and dispersion; Probability; Normal distribution; Central limit theorem; Hypothesis testing; Confidence intervals; Regression-correlation. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Students may not take MATH 141 if credit has been received from MATH 123. Prerequisite: MATH 102 (C or better required) or equivalent, or placement into MATH 103, MATH 147, or MATH 151. 3 credits (online or lecture format), fall or spring semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 145. Discrete Mathematics. (3 Credits)
Primarily for students in Computer Science and Computer Information Systems curricula or others with permission. Topics include: Logic; Set theory; Introduction to combinatorics; Relations and functions; Introduction to graph theory. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Prerequisite: MATH 102 (C or better required) or equivalent, or placement into MATH 103, MATH 147, or MATH 151. 3 credits (3 lecture hours), fall semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 147. Selected Topics In Precalculus. (3 Credits)
Topics include: Functions and their inverse; Polynomial functions; Operations on complex numbers; Rational functions and their graphs; Trigonometric identities; Inverse trigonometric functions; Trigonometric equations. Emphasis on calculator solutions. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Prerequisite: MATH 103 (C or better required) or equivalent, or placement into MATH 147. 3 credits (3 lecture hours), fall or spring semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 149. Elementary Linear Algebra. (3 Credits)
Basic elements of linear algebra, an area of mathematics with applications in a wide variety of fields. Topics include: Systems of linear equations including matrix solution using Gauss-Jordan elimination; Matrix operations; Inverse; Computations via calculator; Determinants; The vector space, linear combinations and independence, span, basis; Dot and cross product; Eigenvalues and eigenvectors. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Prerequisite: MATH 103 (C or better required) or equivalent, or placement into MATH 147 or MATH 151. 3 credits (3 lecture hours), spring semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 151. General Calculus A. (3 Credits)
Topics include: Introduction to limits and continuity; Derivatives of algebraic functions: definition and notation, differentiation rules, implicit differentiation; Applications of the derivative: slope, velocity and acceleration, rate of change, related rates, curve sketching, and optimization; Integration: notation and terminology, definite and indefinite integrals; The Fundamental Theorem of Calculus; Applications Integration by substitution. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Prerequisite: MATH 147 (C or better required) or equivalent, or placement into MATH 151. 3 credits (3 lecture hours), fall or spring semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 152. General Calculus B. (3 Credits)
Topics include: Differentiation and integration of logarithmic, exponential and inverse trigonometric functions; Applications including growth and decay, finding areas, volumes, centroids, fluid pressure, work, and arc length; Techniques of integration; Indeterminate forms with L'Hopital's Rule; Improper integrals. (TI-83 plus or TI-84 plus required, TI-Nspire or similar calculator is not allowed.) Prerequisite: MATH 151 (C or better required) or equivalent 3 credits (3 lecture hours), fall or spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics

MATH 153. Business Calculus. (3 Credits)
This course is an introduction to differential and integral calculus with particular emphasis on applications in business and related areas. Topics include Functions (polynomial, rational, exponential and logarithmic); Continuity; Limits; Derivatives and differentiation techniques; Marginal analysis; Curve sketching techniques; Optimization; Interest, Integrals and integration techniques; Fundamental Theorem of Calculus; Area between curves; Future value of a continuous income stream. (TI-83 plus or TI-84 plus required, TI- Nspire or similar calculator is not allowed.) Prerequisite: MATH 147 (C or better required) or equivalent, or placement into math 151 or higher (If credit has been received for MATH 151, or equivalent, then permission must be obtained by instructor to register for MATH 153.) 3 credits (3 lecture hours), fall or spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics

MATH 161. Calculus I. (4 Credits)
Topics include Review of algebra and analytic geometry; Concepts of limit and derivative of a function; Differentiation and integration of functions including trigonometric, exponential, logarithmic functions and inverse trigonometric functions; Applications to engineering. (TI-83 plus or TI-84 plus required.) Prerequisite: MATH 147 (C or better required) or placement into MATH 151. 4 credits (4 lecture hours), fall semester. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics (and Quantitative Reasoning).

MATH 162. Calculus II. (4 Credits)
Topics include: Applications of integration and integration techniques; Infinite series; Parametric equations and polar coordinates; Applications to engineering. (TI-83 plus or TI-84 plus required.) Prerequisite: MATH 161 (C or better required) 4 credits (4 lecture hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics

MATH 252. Analytic Geometry&Calculus IV. (3 Credits)

MATH 261. Calculus III. (4 Credits)
Topics include: Vectors in the plane and in three dimensional space; Vector functions; Functions of several variables; Partial derivatives and multiple integration; Vector calculus; Applications to engineering. (TI-83 plus or TI-84 plus required.) Prerequisite: MATH 162 (C or better required) 4 credits (4 lecture hours), fall semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics

MATH 262. Differential Equations. (4 Credits)
Topics include ordinary differential equations and their solutions; Classical solutions of linear differential equations; Solutions by use of series and by Laplace transforms; Matrix procedures with solutions to linear systems of differential equations using eigenvalues; Introduction to partial differential equations; Applications in the field of chemistry, physics and engineering. (TI- 83 plus or TI-84 plus required.) Prerequisite: MATH 261 (C or better required) 4 credits (4 lecture hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Mathematics