

MATH - 1004 Mathematical Concepts*, 4.00 Credits

Level: Upper

Quantway 1 Comparison, Remedial

This course will introduce the students to the following topics: order of operations, operations on real numbers, simplifying algebraic expressions, integer exponents, solving linear equations in one variable, graphing linear equations in two variables, and applications such as geometry and modeling. Emphasis is placed on reviewing basic arithmetic skills and elementary algebra topics. Development of arithmetic skills throughout the semester is essential, therefore students will not be allowed to use calculators. Students will work on the development of thinking skills through creative problem solving, writing to explain methods and solutions to problems, and collaborative learning. This is a remedial/developmental course; it will not satisfy any graduation requirements. A grade of C or better is required to register for any subsequent math course.

MATH - 1014 Algebra Concepts, 4.00 Credits

Prerequisite(s): MATH 1004 with C* or better

Level: Lower

Liberal Arts and Science

This course is intended for students who need more preparation to be successful in College Algebra or other courses of that level. Topics covered include: review of first degree equations, systems of equations and inequalities, graphing, polynomials, factoring, radicals and rational exponents, quadratic equations, rational expressions, relations and functions and an introduction to triangle trigonometry. This course prepares students to enter Math 1033 - College Algebra, Math 2124 - Statistical Methods and Analysis, Math 1423 - Explorations in Geometry, Math 1323 - Quantitative Reasoning and Math 2163 - Discrete Mathematics. A grade of C or better is required in Math 1014 to register for these courses. THIS COURSE DOES NOT FULFILL THE GEN-ED MATH REQUIREMENT.

MATH - 1033 College Algebra, 3.00 Credits

Prerequisite(s): MATH 1014 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course includes topics such as polynomials, radicals, exponents, coordinate geometry, rational expressions and equations, and solutions to linear and quadratic equations. Students are introduced to the concept of functions and their graphs. Additional topics may include conic sections, matrices, variation, and nonlinear inequalities. Emphasis will be placed on problem solving. A graphing calculator is required. Students cannot receive credit for MATH 1033 if they have credit for MATH 1054. Students cannot receive credit for MATH 1033 if they have credit for MATH 1063, MATH 1084, or any course for which MATH 1063 or MATH 1084 are prerequisites. A grade of C or better is required to take Math 2043, College Trigonometry.

MATH - 1034 College Algebra of Functions, 4.00 Credits

Prerequisite(s): MATH 1014 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course includes topics such as polynomials, radicals, exponents, coordinate geometry, rational expressions and equations, and solutions to linear and quadratic equations. Students are introduced to the concept of functions and their graphs. Additional topics may include conic sections, matrices, variation, and nonlinear inequalities. Emphasis will be placed on problem solving. A graphing calculator is required. The course is designed to give students additional time above that allotted in MATH 1033 working on mastery of concepts and skills in the student learning outcomes. Students cannot receive credit for MATH 1034 if they have credit for MATH 1033 or for MATH 1054. Students cannot receive credit for MATH 1034 if they have credit for MATH 1063, MATH 1084, or any course for which MATH 1063 or MATH 1084 are prerequisites. A grade of C or better is required to take MATH 2043, College Trigonometry.

MATH - 1054 Precalculus, 4.00 Credits

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is designed primarily for the student who needs a foundation in algebra and trigonometry for the study of calculus. The concept of function and graphical representation of functions is stressed. Topics covered include: real numbers; algebra of real numbers including equations and inequalities; functions and their graphs including polynomial, rational expressions, logarithmic and exponential, trigonometric; algebra of the trigonometric functions including identities, equations, polar coordinates, complex numbers, systems of equations. Prerequisites: NYS 80 HS Average Math A and B (or Course 1,2,3), plus a 4th year Math, or equivalent.

MATH - 1063 Technical Calculus I, 3.00 Credits

Prerequisite(s): (MATH 1033 with C or better and MATH 2043 with D or better) or (MATH 1034 with C or better and MATH 2043 with D or better) or MATH 1054 with D or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course includes a review of functions, an introduction to the concept of limits, and a study of the techniques of differentiation and integration of algebraic functions with applications to the various technologies. A graphing calculator is required. Credit for MATH 1063, Technical Calculus I will not be allowed if student receives credit for MATH 1084, Calculus I.

MATH - 1084 Calculus I, 4.00 Credits

Prerequisite(s): MATH 2043 with D or better or MATH 1054 with D or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is designed for the student intending to continue his/her education in mathematics, science or engineering. The course includes a thorough treatment of limits leading to the Limit definition of the derivative and definite integral. Properties and rules to differentiate and integrate algebraic and transcendental functions and numerous applications of the derivative and integral will be studied. A graphing calculator is required. Students cannot receive credit for both MATH 1063 and MATH 1084.

MATH - 1104 Quantway I*, 4.00 Credits

Level: Lower

Quantway 1, Remedial

Quantway I focuses on math for everyday life. It integrates fluency with numbers, proportional reasoning, data interpretation, algebraic reasoning, models, and communicating quantitative information. Mathematical concepts are investigated through group problems and class discussions based on real-life contexts of citizenship, personal finance, and model literacy. This is a remedial/developmental course; it will not satisfy any graduation requirements. A grade of C or better is required to register for any subsequent math course. The course prepares students to take college level non-STEM courses in mathematics, such as MATH 1014, MATH 1113, or MATH 1123.

MATH - 1113 Statistical Concepts, 3.00 Credits

Prerequisite(s): MATH 1004 with C* or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This is a 3 credit, one-semester course which provides an introduction to and understanding of the basic concepts of statistics. Actual computation will be minimal; computers will be used whenever calculations are necessary. Emphasis will be placed on the meaning of statistical results. Content will include sampling, experiments, measurement, organizing data, and statistical indices. Optional topics include probability, time trends, survey design and basic inference concepts.

MATH - 1114 Quantway II, 4.00 Credits

Prerequisite(s): MATH 1104 with C* or better or MATH 1143 with C or better or MATH 1014 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science, Quantway 2

This course uses mathematical and statistical reasoning in everyday life decision-making. The course integrates percentages, probability, mathematical modeling, and statistical thinking within quantitative literacy. This is achieved through hands-on, collaborative learning with a focus on medical, financial and citizenship real-world examples. A student may not receive credit for MATH 1114 if they have already received credit for MATH 1323.

MATH - 1123 Statistics I, 3.00 Credits

Prerequisite(s): MATH 1003 with C* or better or MATH 1004 with C* or better or MATH 1104 with C* or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is the first of a two semester sequence in statistics. It covers mainly descriptive techniques such as data collection, organization techniques, measures of center, spread, and position. Other topics covered include: probability, probability distributions (such as normal and binomial distributions), correlation and regression. Students cannot earn credit for MATH 1123 if they have credit for MATH 2124. A grade of C or better is required to take MATH 2133, Statistics II.

MATH - 1143 Liberal Arts Math I, 3.00 Credits

Prerequisite(s): MATH 1004 with C* or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This is a one semester course whose basic objective is to develop an interest and appreciation for Mathematics in students with little background in the subject. Included in the course are topics from the following areas: Problem Solving, Inductive Reasoning, Logic, Sets, Probability, Statistics, Consumer Math, and Geometry. It may also include topics from the following areas: History of Math, Number Systems, Metric, Algebra, Linear Programming, Finite Math, Matrices, Computer Applications.

MATH - 1204 Statway I*, 4.00 Credits

Level: Lower

Remedial, Statway

Statway I is the first course in the two-semester Statway course sequence. The Statway course sequence is recommended for students enrolled in degree programs that require no math beyond college level statistics. Both courses in the sequence, Statway I and Statway II, must be taken to receive credit for college level statistics. Students will use mathematical and statistical tools to explore real-life data in a participatory learning environment. Statway I topics include an introduction to data analysis, statistical studies, sampling, experimental design, descriptive statistics techniques, scatterplots, correlation and regression, modeling data with functions, linear and exponential functions, and probability. This course requires the use of statistical technology. This is a remedial/developmental course; it will not satisfy any graduation requirements. A grade of C or better is required to register for any subsequent math course. After completing this course, students will be able to take Statway II or MATH 1143. Students are not allowed to take MATH 1113 or MATH 1123 after successful completion of Statway I.

MATH - 1323 Quantitative Reasoning, 3.00 Credits

Prerequisite(s): MATH 2003 with C or better or MATH 1014 with D or better or MATH 1143 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is designed for curricula where quantitative reasoning is required. The course content includes critical thinking skills, arithmetic and algebra concepts, statistical concepts, financial concepts, as well as numerical systems and applications. A graphing calculator is required. This is an entry level course and requires three years of high school math equivalent to NYS Course 1, 2, and 3; or Math A and B.

MATH - 1423 Explorations in Geometry, 3.00 Credits

Prerequisite(s): MATH 2003 with C or better or MATH 1014 with D or better

Level: Lower

Applied Learning-Creative Work, Gen Ed - Math, Liberal Arts and Science

The content of this course will apply geometrical truths in a variety of contexts, including knots, tessellations and graphical symmetry. In addition, it will cover some principles of Gestalt perceptual properties, the exploration and creation of models of geometric art from other cultures, and any additional material deemed suitable by the instructor. The material will involve experimentation by the student in a geometric forum to discover or verify properties of 2- and 3-dimensional objects and patterns. The software AutoCAD or a similar program for drawing on a computer as well as 2- and 3-dimensional modeling tools will be used extensively to enhance spatial intelligence skills and awareness of properties. Students will learn to analyze designs by identifying their geometric component parts and create designs by combining geometric shapes. They will identify the rules used in creating the design and will create new designs by varying some of those rules.

MATH - 2043 College Trigonometry, 3.00 Credits

Prerequisite(s): MATH 1033 with C or better or MATH 1034 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is designed for the college student who has demonstrated mastery of algebra skills and techniques. Topics include trigonometric functions and their properties with the study of identities, formulas, equations, and graphs. Also included are the solution of right and oblique triangles using the law of sines and cosines. In addition, time is spent exploring logarithmic and exponential functions. Emphasis is placed on contextual applications and problem solving. A graphing calculator is required. Credit cannot be received for both MATH 2043 and MATH 1054. Students cannot receive credit for MATH 2043 if they have credit for MATH 1063, MATH 1084, or any course for which MATH 1063 or MATH 1084 are prerequisites.

MATH - 2074 Technical Calculus II, 4.00 Credits

Prerequisite(s): MATH 1063 with D or better or MATH 1084 with D or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

A continuation of MATH 1063 with further study in differentiation and integration of both the algebraic and transcendental functions. Applications will be included in each topic. An introduction to Matrix Algebra may be included. Graphing Calculator required. Student cannot receive credit for MATH 2074 if they have received credit for MATH 1084.

MATH - 2094 Calculus II, 4.00 Credits

Prerequisite(s): MATH 1084 with D or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is designed as a continuation of MATH 1084 with a concentrated study of integration techniques along with applications. Applications include but are not limited to areas, volumes, and arc length. The course involves the methods of integration and applications as they apply to both the algebraic and transcendental functions. Infinite series and Taylor series will be included. A graphing calculator is required. Student cannot receive credit for both MATH 2094 and MATH 2074.

MATH - 2124 Statistical Methods & Analysis, 4.00 Credits

Prerequisite(s): MATH 1033 with C or better or MATH 1034 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This is a one-semester (non-calculus based) course which covers descriptive as well as inferential statistics. Included are topics on collecting, organizing, and summarizing data. Other topics include correlation and regression, probability, normal and binomial probability distributions, normal approximation to the binomial, central limit theorem, confidence intervals, hypothesis testing, and nonparametric statistics.

MATH - 2133 Statistics II, 3.00 Credits

Prerequisite(s): MATH 1123 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

A continuation of MATH 1123 emphasizing probability distributions with predictive and inferential aspects of statistics: the normal distribution with applications, central limit theorem, hypothesis testing and estimation as applied to the mean, standard deviation, and proportions. Other topics include normal approximation to binomial, Chi-Square applications, linear regression, correlation, and nonparametric statistics. Use of calculators for analysis and computer statistical packages are utilized.

MATH - 2163 Discrete Mathematics, 3.00 Credits

Prerequisite(s): MATH 1033 with C or better or MATH 1034 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is designed for Information Technology and Mathematics and Science students. The course will introduce and discuss the following topics: functions, relations, sets, logic, counting methods, methods of proof, network graphs and trees, algorithmic analysis, complexity and computability, and matrices. A graphing calculator is required.

MATH - 2900 Directed Study, 1.00 TO 4.00 Credits

Level: Lower

Liberal Arts and Science

A student may contract for from one to four credit hours of independent study in mathematics through an arrangement with an instructor of mathematics. The student and instructor will develop a course of study which must be approved by the department chairperson and the school dean. The instructor and the student will confer regularly regarding the student's progress.

MATH - 3003 Linear Algebra, 3.00 Credits

Prerequisite(s): MATH 1084 with C or better or MATH 1063 with C or better

Level: Lower

Gen Ed - Math, Liberal Arts and Science

This course is an introduction to linear algebra. Topics covered include solutions to systems of linear equations, linear independence, matrix algebra, vector spaces, eigenvalues and eigenvectors. Students will learn how to use technology (e.g. calculators, MAPLE, MATLAB, or Mathematica) to perform related tasks.

MATH - 4900 Directed Study, 1.00 TO 6.00 Credits

Level: Lower

Liberal Arts and Science

A student may contract for one to six credit hours of independent study through an arrangement with an instructor who agrees to direct such a study. The student will submit a plan acceptable to the instructor and to the department chair. The instructor and student will confer regularly regarding the process of the study.

MATH - 5023 Math Foundations Cryptography, 3.00 Credits

Prerequisite(s): MATH 1084 with D or better

Level: Upper

Liberal Arts and Science

This course is designed to develop the mathematical skills that a student would need in order to analyze and implement historical and modern day cryptography. Historical cryptography will include discussion of the following ciphers: shift, affine, block, substitution, Vigenere, Playfair, ADFGX, binary and ASCII. Modern day cryptography will include discussion of: DES, AES, RSA and ElGamal public key encryption. Applications of modern day cryptography will include digital signatures and e-commerce. Maple software will be used to perform encryption and decryption. Prerequisite: MATH 1084 or permission from instructor.

MATH - 6104 Multivariate & Vector Calculus, 4.00 Credits

Prerequisite(s): MATH 2094 with D or better or MATH 2074 with D or better or MATH 6114 with D or better

Level: Upper

Gen Ed - Math, Liberal Arts and Science

This course is designed as a continuation of Integral Calculus. Topics will include: parametric equations, polar, cylindrical and spherical coordinate systems, vectors and vector valued functions, functions of several variables, partial derivatives and applications, multiple integrals, and vector analysis, including Green's theorem, Stokes' theorem, and Gauss' theorem. The course will include several major projects outside of class.

MATH - 6114 Differential Equations, 4.00 Credits

Prerequisite(s): MATH 2094 with D or better or MATH 2074 with D or better or MATH 6104 with D or better

Level: Upper

Gen Ed - Math, Liberal Arts and Science

This is the beginning study of the solution of differential equations with emphasis on both analytic and numerical solutions. Topics include first and second order differential equations and their solutions, series solutions, Laplace transforms, linear equations of higher order, numerical solutions or ordinary differential equations using Euler and Runge-Kutta methods, and the use of Eigenvalue methods to solve linear systems. In addition, this course emphasizes the development of differential equations as mathematical models for a variety of practical applications. The course will include several major projects outside of class.

MATH - 7113 Economic Analy for Engr Tech, 3.00 Credits

Prerequisite(s): MATH 1063 with D or better or MATH 1084 with D or better

Level: Upper

Gen Ed - Math, Liberal Arts and Science

This course covers basic pricing formulas, cost estimation techniques, present economic studies, time-value of money, evaluating a single alternative, comparison and selection among multiple alternatives, and depreciation.

MATH - 7123 Statistics for Engr Tech & Sci, 3.00 Credits

Prerequisite(s): MATH 2074 with D or better or MATH 2094 with D or better

Level: Upper

Gen Ed - Math, Liberal Arts and Science

This course offers the theoretical basis for probability and statistics related to engineering applications. Topics include data analysis techniques, correlation and regression, probability, probability distributions, confidence intervals, and hypothesis tests concerning means and standard deviations. Graphing calculators are required. Computer applications may be included.