Mathematics (MATH)

MATH 100-CN Quantitative Reasoning (1 Unit)
NPEP course.

MATH 100-DL Quantitative Reasoning (1 Unit)
Analysis of real-life problems from a quantitative perspective. Students
develop skills in estimation, financial literacy, probability, and statistics.
Focus on the organization of complex ideas into simple, quantifiable
parts.

MATH 101-CN Algebra (1 Unit)
Overview of core mathematical concepts that permeate business,
science and everyday life. Primary focus is on mathematical tools
needed in a variety of degree programs. Topics include: functions and
graphs, linear, polynomial and rational equations, inequalities and their
applications, modeling, variation, and systems of equations. This course
does not count for credit if taken after any higher mathematics course.
May not be audited.

MATH 101-DL Algebra (1 Unit)
Overview of core mathematical concepts that permeate business,
science and everyday life. Primary focus is on mathematical tools
needed in a variety of degree programs. Topics include: functions and
graphs, linear, polynomial and rational equations, inequalities and their
applications, modeling, variation, and systems of equations. This course
does not count for credit if taken after any higher mathematics course.
May not be audited.

MATH 110-CN Introduction to Mathematics (1 Unit)
NPEP course.

MATH 113-CN Precalculus Mathematics (1 Unit)
Properties and graphs of the basic functions: polynomial, rational,
exponential, logarithmic, and trigonometric. Complex numbers, theory of
equations, and selected topics are also included. May not be audited.

MATH 202-CN Finite Mathematics (1 Unit)
Foundation of mathematical knowledge targeting data analysis. Topics
chosen from set theory, combinatorics (the art of counting), finite
probability, elementary linear algebra and its applications to linear
optimization problems.

MATH 211-CN Short Course in Calculus (1 Unit)
Elements of differential and integral calculus.

MATH 220-A Single-Variable Differential Calculus (1 Unit)
Limits. Differentiation. Linear approximation and related rates. Extreme
value theorem, mean value theorem, and curve-sketching. Optimization.

MATH 220-A-DL Single-Variable Differential Calculus (1 Unit)
Limits, Differentiation. Linear approximation and related rates. Extreme
value theorem, mean value theorem, and curve-sketching. Optimization.

MATH 220-B Single-Variable Integral Calculus (1 Unit)
Definite integrals, antiderivatives, and the fundamental theorem of
calculus. Transcendental and inverse functions. Areas and volumes.
Techniques of integration, numerical integration, and improper integrals.
First-order linear and separable ordinary differential equations.
Prerequisite: MATH 220-A.

MATH 220-B-DL Single-Variable Integral Calculus (1 Unit)
Definite integrals, antiderivatives, and the fundamental theorem of
calculus. Transcendental and inverse functions. Areas and volumes.
Techniques of integration, numerical integration, and improper integrals.
First-order linear and separable ordinary differential equations.
Prerequisite: MATH 220-A, MATH 220-A-DL.

MATH 226-CN Sequences and Series (1 Unit)
Sequences, series, and convergence tests. Power series, Taylor
polynomials and error. Complex numbers. Second-order linear ordinary
differential equations and power series solutions.
Prerequisite: MATH 220-B.

MATH 230-A Multivariable Differential Calculus (1 Unit)
Vectors, vector functions, partial derivatives, and optimization.
Prerequisite: MATH 220-B.

MATH 230-B Multivariable Integral Calculus (1 Unit)
Multiple integration: double integrals, triple integrals, and the change of
variables theorem. Vector calculus: vector fields, line integrals, surface
integrals, curl and divergence, Green's theorem, Stokes' theorem, and the
divergence theorem.
Prerequisite: MATH 230-A.

MATH 240-CN Linear Algebra (1 Unit)
Elementary linear algebra: systems of linear equations, matrix algebra,
subspaces, determinants, eigenvalues, eigenvectors, and orthogonality.
Prerequisite: MATH 230-A or equivalent.

MATH 250-CN Elementary Differential Equations (1 Unit)
Elementary ordinary differential equations: first-order equations, second-
order linear equations, series solutions, and systems of first-order linear
equations.
Prerequisite: MATH 230-A, MATH 240-CN, or equivalents.

MATH 300-CN Foundations of Higher Mathematics (1 Unit)
Introduction to fundamental mathematical structures, including sets,
functions, equivalence relations, and cardinal numbers. Elementary logic
and proof techniques.
Prerequisite: MATH 240-CN.

MATH 306-CN Combinatorics & Discrete Mathematics (1 Unit)
Discrete mathematics, inductive reasoning, counting problems, binomial
coefficients and Pascal's triangle, Fibonacci numbers, combinatorial
probability, divisibility and primes, partitions, and generating functions.
Prerequisite: MATH 240-CN.

MATH 310-A Probability and Stochastic Processes (1 Unit)
Axioms of probability. Conditional probability and independence. Random
variables. Joint distributions. Expectation. Limit theorems: the weak law
of large numbers and the central limit theorem.
Prerequisite: MATH 230-B.

MATH 310-B Probability and Stochastic Processes (1 Unit)
Discrete-time Markov chains, recurrence and transience.
Prerequisite: MATH 240-CN and MATH 310-A.

MATH 310-C Probability and Stochastic Processes (1 Unit)
Continuous-time Markov chains, queues, population growth models.
Brownian motion and other diffusion processes.
Prerequisite: MATH 310-B.

MATH 320-A Introduction to Real Analysis (1 Unit)
Analysis on the real line: axiomatic development of the real number
system, sequences and series of real numbers, continuity, and
differentiability.
Prerequisite: MATH 300-CN.

MATH 320-B Real Analysis II (1 Unit)
Analysis on the real line: the Riemann integral and sequences and series
of functions.
Prerequisite: MATH 320-A.

MATH 320-C Introduction to Real Analysis (1 Unit)
Analysis on Euclidean spaces: the topology of Euclidean spaces, limits, continuity, and differentiability, including the inverse and implicit function theorems.

**Prerequisite:** MATH 320-B.

**MATH 325-CN Complex Analysis (1 Unit)**
**Prerequisite:** MATH 230-B.

**MATH 330-A Abstract Algebra (1 Unit)**
Group theory.
**Prerequisite:** MATH 300-CN.

**MATH 334-CN Linear Algebra II: Second Course (1 Unit)**
**Prerequisite:** MATH 300-CN.

**MATH 336-A Introduction to the Theory of Numbers (1 Unit)**
**Prerequisite:** MATH 230-A.

**MATH 340-CN Geometry (1 Unit)**
**Prerequisite:** MATH 300-CN.

**MATH 366-A Mathematical Models in Finance (1 Unit)**
**Prerequisite:** MATH 240-CN.

**MATH 399-CN Independent Study (1 Unit)**