



**MATH 113 | Trigonometry | 2 cr**

Introduces trigonometry with applications including angular and circular definitions of trigonometric functions, graphing, use of fundamental identities.

**Prerequisites:** MATH 112 or equivalent or concurrent registration.

**Offered:** Fall, Spring.

**MATH 114 | College Algebra II/Trigonometry | 5 cr**

Covers functions and graphs, polynomials and rational functions, exponential and logarithmic functions, trigonometric functions, trigonometric identities and equations, applications, sequences, series. Not open to those with credit in MATH 112 or 113.

**Prerequisites:** MATH 111 with C or better; or equivalent, or appropriate placement; not open to those with credit in MATH 112 or MATH 113.

**Offered:** Fall, Spring.

**MATH 203 | Intermediate Statistics | 3 cr**

Introduces inferential statistics including elementary combinatorics and probability, binomial and normal distributions, Central Limit Theorem, estimation, confidence intervals, hypothesis testing, correlation, regression, chi-square distribution, and analysis of variance.

**Prerequisites:** Successful completion of Computational Skills requirement.

**Offered:** Spring.

**MATH 215 | Math for Middle Childhood Through Early Adolescence Teachers I | 3 cr**

Topics include the development of the algorithms of arithmetic, numeration systems, problem solving, number theory and set theory.

**Prerequisites:** MATH 111 with grade of C or better or consent of instructor.

**Offered:** Occasionally.

**MATH 216 | Math for Middle Childhood Thru Early Adolescence Teachers II | 3 cr**

Topics include introductory geometry, constructions, congruence, similarity, motion geometry, concepts of measurements, probability and statistics.

**Prerequisites:** MATH 215.

**Offered:** Occasionally.

**MATH 221 | Calculus and Analytic Geometry I | 5 cr**

Explains rate of change and limits, differentiation, applications of the derivative, integration, applications of the integral and transcendental functions.

**Prerequisites:** MATH 112 and MATH 113 or equivalent; or appropriate placement.

**Offered:** Fall, Spring.

**Meets:** Natural Science: MATH, Natural Science: MATH, Natural Science: MATH, Natural Science: MATH, Natural Science: MATH

**MATH 222 | Calculus and Analytic Geometry II | 5 cr**

Examines methods of integration, analytic geometry, polar coordinates, hyperbolic functions, infinite series, power series, and introduces ordinary differential equations.

**Prerequisites:** MATH 221.

**Offered:** Fall, Spring.

**Meets:** Natural Science: MATH, Natural Science: MATH, Natural Science: MATH, Natural Science: MATH, Natural Science: MATH

**MATH 223 | Calculus and Analytic Geometry III | 5 cr**

Explains vectors and parametric equations, vector functions and their derivatives, partial and directional derivatives, multiple integrals, vector analysis, Green's Theorem and Stokes' Theorem.

**Prerequisites:** MATH 222.

**Offered:** Fall.

**MATH 231 | Discrete Mathematics | 3 cr**

Covers sets; the number system; Boolean algebra; formal logic and proofs; relations and functions; combinatorics and recurrence relations; graphs and trees. Cross-listed with: CSCI 231.

**Prerequisites:** MATH 112 with a C or better.

**Offered:** Fall, Spring.

**MATH 290 | Special Topics in Mathematics | 1-4 cr**

Selected topics in mathematics will be examined.

**Prerequisites:** None.

**Offered:** Occasionally.

**MATH 301 | Linear Algebra | 4 cr**

Introduction to linear algebra including systems of equations, matrices, determinants, vector spaces and linear transformations, and diagonalization.

**Prerequisites:** MATH 223; or MATH 222 and consent of instructor.

**Offered:** Fall.

**MATH 303 | Set Theory, Logic and Proof | 4 cr**

Examines elementary propositional and predicate logic; language and axioms of set theory; operations on sets; well-orderings, ordinals, transfinite induction and recursion; cardinals; the axiom of choice; combinatorics; reading and writing of proofs in mathematics. Cross-listed with: PHIL 303.

**Prerequisites:** MATH 222; or PHIL 201 and consent of instructor.

**Offered:** Fall.

**MATH 309 | Probability and Statistics | 3 cr**

Covers elementary probability, random variables, properties of distributions, sampling, queuing theory, central limit theorem and law of large numbers. Cross-listed with: CSCI 309.

**Prerequisites:** MATH 221 with a C or better.

**Offered:** Spring.

**MATH 310 | Advanced Probability Theory and Statistics | 4 cr**

The main mathematical methods and techniques of probability theory; random variables, expected values, variance, central limit theorem, parameter estimation and hypothesis testing.

**Prerequisites:** MATH 223.

**Offered:** Fall.

**MATH 317 | Differential Equations and their Applications | 4 cr**

Examines first- and second-order differential equations and applications; higher-order linear differential equations; series solutions of second-order differential equations; Laplace transforms; matrix algebra, systems of equations, eigen values and eigenvectors; systems of differential equations; and partial differential equations.

**Prerequisites:** MATH 222.

**Offered:** Fall.

**MATH 331 | Logic and Combinatorics | 3 cr**

Permutations and combinations, graphs, trees, mathematical induction, propositional calculus, Mathematica and its applications in combinatorics, number theory and linear programming. Intended for students working for teaching certification in Mathematics.

**Prerequisites:** MATH 222.

**MATH 350 | Advanced Calculus | 4 cr**

Covers the fundamental notions of limits, continuity, uniform continuity, derivative, and integral. Examines infinite series with a study of convergence and uniform convergence.

**Prerequisites:** MATH 223, MATH 303.

**Offered:** Spring.

**MATH 361 | Foundations of Geometry | 3 cr**

Introduction to axiomatic geometry including Euclidean, non-Euclidean, and projective geometries.

**Prerequisites:** MATH 222.

**MATH 367 | Elementary Number Theory | 4 cr**

Prime numbers, fundamental theorem of arithmetic, congruence, quadratic residues and quadratic reciprocity, number theoretic functions and diophantine equations.

**Prerequisites:** MATH 222.

**MATH 368 | Mathematical Modeling | 3 cr**

Surveys mathematical models, models involving differential equations, probabilistic models, Markovian-models, simulation, and Monte Carlo methods. Cross-listed with: CSCI 368.

**Prerequisites:** MATH 222; PHYS 241 or CSCI 130; or consent of instructor.

**Offered:** Yearly.

**MATH 370 | Numerical Analysis | 4 cr**

Introduces theory and practical use of certain basic numerical methods that often arise in applications. Covers numerical methods for solving linear and nonlinear equations, approximating functions, computing integrals, and derivatives.

**Prerequisites:** MATH 317 or consent of instructor.

**Offered:** Spring.

**MATH 373 | History of Mathematics | 3 cr**

Main lines of mathematical development from the Babylonians, Egyptians and Greeks to the present day; the lives of great mathematicians: Euclid, Archimedes, Descartes, Newton, Gauss, Cantor.

**Prerequisites:** MATH 221 or consent of instructor.

**Offered:** Occasionally.

**MATH 401 | Applied Mathematics | 3 cr**

Explores traditional analytical and numerical methods enriched by modern mathematical developments and applications to various fields such as ocean and atmospheric sciences. Combines approximate forms of the basic mathematical equations of motion with analysis.

**Prerequisites:** MATH 223 and MATH 317.

**Offered:** Fall (odd years).

**MATH 423 | Complex Analysis | 4 cr**

Examines elementary functions of a complex variable; analytic -functions; complex integrals and residue theory; conformal mapping; applications to electrostatics and hydrodynamics.

**Prerequisites:** MATH 223, MATH 303.

**Offered:** Spring.

**MATH 441 | Abstract Algebra | 4 cr**

A study of group theory which includes subgroups, normal subgroups, isomorphisms, quotient groups, Cayley's Theorem, and Lagrange's Theorem. Provides an introduction to ring theory which includes subrings, ideals and factor rings, and polynomial rings.

**Prerequisites:** MATH 301, MATH 303 or consent of instructor.

**Offered:** Fall.

**MATH 451 | Topology | 4 cr**

Explores theory of topological spaces, metric spaces, continuous functions, connectedness, compactness, and manifolds.

**Prerequisites:** MATH 301 and MATH 350; or consent of instructor.

**Offered:** Occasionally.

**MATH 461 | Differential Geometry | 3 cr**

Local theory of curves and surfaces, curvature tensors, and global theory of surfaces.

**Prerequisites:** MATH 301 and MATH 350.

**Offered:** Occasionally.

**MATH 490 | Special Topics in Mathematics | 1 cr**

Intensive treatment of various specialized areas of mathematics.

**Prerequisites:** Instructor consent.

**Offered:** Occasionally.

**MATH 495 | Senior Seminar | 1-2 cr**

Research and presentation of selected topics from the mathematical literature.

**Prerequisites:** Senior standing and consent of instructor.

**Offered:** Fall.

**MATH 499 | Independent Study | 1-4 cr**

**Prerequisites:** Consent of instructor and department chair.

**Offered:** Occasionally.