

Mathematical Analysis

Students enrolled in Mathematical Analysis are assumed to have mastered Geometry and Algebra II concepts. Mathematical Analysis develops students' understanding of algebraic and transcendental functions, parametric and polar equations, sequences and series, and vectors. The content of this course serves as appropriate preparation for a calculus course.

Graphing utilities (calculators, computers, and other technology tools) will be used to assist in teaching and learning. Graphing utilities facilitate visualizing, analyzing, and understanding algebraic and statistical behaviors and provide a powerful tool for solving and verifying solutions.

Functions

- MA.1 The student will investigate and identify the properties of polynomial, rational, piecewise, and step functions and sketch the graphs of the functions.
- MA.2 The student will investigate and identify the characteristics of exponential and logarithmic functions to graph the function, solve equations, and solve practical problems.
- MA.3 The student will apply compositions of functions and inverses of functions to practical situations and investigate and verify the domain and range of resulting functions.
- MA.4 The student will determine the limit of an algebraic function, if it exists, as the variable approaches either a finite number or infinity.
- MA.5 The student will investigate and describe the continuity of functions.

Analytic Geometry

- MA.6 The student will investigate, graph, and identify the properties of conic sections from equations in vertex and standard form.
- MA.7 The student will perform operations with vectors in the coordinate plane and solve practical problems using vectors.
- MA.8 The student will identify, create, and solve practical problems involving triangles.

Equations

- MA.9 The student will investigate and identify the characteristics of the graphs of polar equations.
- MA.10 The student will use parametric equations to model and solve practical problems.
- MA.11 The student will use matrices to organize data and will add and subtract matrices, multiply matrices, multiply matrices by a scalar, and use matrices to solve systems of equations.

Discrete Mathematics

- MA.12 The student will expand binomials having positive integral exponents.
- MA.13 The student will determine the sum of finite and infinite convergent series.
- MA.14 The student will use mathematical induction to prove formulas and mathematical statements.