Scope and Sequence
Mathematics
BC Calculus - AP

Description: This is an AP level course which follows Honors Precalculus. Students will study limits, differential calculus and its applications (related rates, curve sketching, optimization, max/ min), integral calculus and its applications (area, volume, length of a curve), and infinite series. They will learn to take the derivatives and integrals of trig functions, inverse trig functions, exponential and logarithmic functions, parametric functions, vectors, and polar functions. A Texas Instruments graphing calculator is required.
Expectations: Students are expected to have a high level of commitment to completion of all classwork and homework.

Unit Name/Description	Content and/or Skills
Limits and Continuity	Rates of Change and Limits Limits Involving Infinity Continuity Rates of Change and Tangent Lines
Derivatives	Derivative of a Function Differentiability Rules for Differentiation (Power Rule, Product Rule, Quotient Rule) Velocity and Other Rates of Change Derivatives of Trigonometric Functions Chain Rule Implicit Differentiation Derivatives of Inverse Functions and Inverse Trig Functions Derivatives of Exponential and Logarithmic Functions

Applications of Derivatives	Extreme Values of Functions Mean Value Theorem Connecting f' and f'' with the Graph of f Modeling and Optimization Linearization and Newton's Method Related Rates
The Definite Integral	Estimating with Finite Sums (RAM) Definite Integrals Definite Integrals and Antiderivatives Fundamental Theorem of Calculus Trapezoidal Rule
Differential Equations and Mathematical Modeling	Antiderivatives and Slope Field Definite Integrals Integration by Substitution Integration by Parts Integration by Partial Fractions Exponential Growth and Decay Euler's Method
Applications of Definite Integrals	Integral as Net Change Areas in the Plane Volumes Lengths of Curves L'Hopital's Rule Relative Rates of Growth Improper Integrals

Midterm Exam	Departmental midterm review and exam
Infinite Series	Power Series Taylor Series Taylor's Theorem Radius of Convergence Testing Convergence at Endpoints
Parametrics, Vector, and Polar Functions	Parametric Functions Vectors in the Plane Polar Functions