

Scope and Sequence

Mathematics

Calculus AB

Description: This is an AP level course which follows Precalculus. Students will study limits, differential calculus and its applications (related rates, curve sketching, optimization, max/ min) and integral calculus and its applications (area, volume). They will learn to take the derivatives and integrals of trig functions, inverse trig functions, exponential and logarithmic 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	<p>Extreme Values of Functions</p> <p>Mean Value Theorem</p> <p>Connecting f' and f'' with the Graph of f</p> <p>Modeling and Optimization</p> <p>Linearization and Newton's Method</p> <p>Related Rates</p>
The Definite Integral	<p>Estimating with Finite Sums (RAM)</p> <p>Definite Integrals</p> <p>Definite Integrals and Antiderivatives</p> <p>Fundamental Theorem of Calculus</p> <p>Trapezoidal Rule</p>
Midterm Exam	Departmental midterm review and exam
Differential Equations and Mathematical Modeling	<p>Antiderivatives and Slope Field</p> <p>Definite Integrals</p> <p>Integration by Substitution</p> <p>Exponential Growth and Decay</p>
Applications of Definite Integrals	<p>Integral as Net Change</p> <p>Areas in the Plane</p> <p>Volumes</p>