

AP Calculus Scope and Sequence

[AP Calculus College Board Standards](#)

Course Description:

Advanced Placement Calculus is a course designed to meet the requirements of Calculus AB as outlined in the Course Description of the Advanced Placement Program in Mathematics. This course primarily develops the students' understanding of the concepts of calculus and provides experience with its methods and applications. Topics include limits, derivatives, integrals, and their applications. At the conclusion of this course, students may take the Advanced Placement Calculus Exam which provides students the opportunity to earn college credit. Graphing calculators will be extensively integrated in the coursework. It is highly recommended that students have access to a graphing tool, either a calculator or an online option, to work with on a daily basis. This course satisfies the 3rd or 4th year Mathematics credit

Scope and Sequence 2025-2026

Semester One
First 9 Weeks (40 Days)
Unit 1 : Limits and Continuity (25 Days) Exam Weight 10-12% 1.1 Introducing Calculus: Can Change Occur at an Instant? 1.2 Defining Limits and Using Limit Notation 1.3 Estimating Limits and using Limit Notation 1.4 Estimating Limit Values From Tables 1.5 Determining Limits Using Algebraic Properties of Limits 1.6 Determining Limits Using Algebraic Manipulation 1.7 Selecting Procedures for Determining Limits 1.8 Determining Limits Using the Squeeze Theorem 1.9 Connecting Multiple Representations of Limits 1.10 Exploring Types of Discontinuities 1.11 Defining Continuity at a Point 1.12 Confirming Continuity over an Interval 1.13 Removing Discontinuities

1.14 Connecting Infinite Limits and Vertical Asymptotes

1.15 Working with the Intermediate Value Theorem

Unit 2 Differentiation: Definition and Fundamental Properties (15 Days)

Exam Weight 10-12%

2.1 Defining Average and Instantaneous Rates of Change at a Point

2.2 Defining The Derivative of a Functions and Using Derivative Notation

2.3 Estimating Derivatives of a Function at a Point

2.4 Connecting Differentiability and Continuity

2.5 Applying the Power Rule

2.6 Derivative Rules: Constant, Sum, Difference, and Constant Multiple

2.7 Derivatives of $\cos x$, $\sin x$, e^x , and $\ln x$

2.8 The Product Rule

2.9 The Quotient Rule

2.10 Finding the Derivatives of Tangent, Cotangent, Secant, and/or Cosecant Functions

Second 9 Weeks (42 Days)

Unit 3 Differentiation: Composite, Implicit, and Inverse Functions (11 Days)

Exam Weight 9-13%

3.1 The Chain Rule

3.2 Implicit Differentiation

3.3 Differentiating Inverse Functions

3.4 Differentiation Inverse Trigonometric Functions

3.5 Selecting Procedures for Calculating Derivatives

3.6 Calculating Higher Order Derivatives

Unit 4 Contextual Applications of Differentiation (12 Days)

Exam Weight 10-15%

4.1 Interpreting the Meaning of the Derivative in Context

4.2 Straight-Line Motion: Connecting Position, Velocity, and Acceleration

4.3 Rates of Change in Applied Contexts Other Than Motion

4.4 Introduction to Related Rates

4.5 Solving Related Rates Problems

4.6 Approximating Values of a Function Using Local Linearity and Linearization

4.7 Using L'Hospital's Rule for Determining Limits of Indeterminate Forms

Unit 5: Analytical Applications of Differentiation (15 Days)**Exam Weight 15-18%**

- 5.1 Using the Mean Value Theorem
- 5.2 Extreme Value Theorem, Global Versus Local Extreme, and Critical Points
- 5.3 Determining Intervals on Which a Function is Increasing or Decreasing
- 5.4 Using the First Derivative Test
- 5.5 using the Candidate Test to Determine Absolute Extrema
- 5.6 Determining Concavity of Functions over their Domain
- 5.7 Using the Second Derivative Test to Determine Extrema
- 5.8 Sketching Graphs of Functions and Their Derivatives
- 5.9 Connecting a Function, Its First Derivative, and Its Second Derivative
- 5.10 Introduction to Optimization
- 5.11 Solving Optimization Problems
- 5.12 Exploring Behaviors of Implicit Relations

Fall Final Exams**Semester Two**

Third 9 Weeks (40 Days)

Unit 6: Integration and Accumulation of Change (26 Days)**Exam Weight 17-20%**

- 6.1 Exploring Accumulations of Change
- 6.2 Approximating Areas with Riemann Sums
- 6.3 Riemann Sums, Summation Notation, and Definite Integral Notation
- 6.4 The Fundamental Theorem of Calculus and Accumulation Functions
- 6.5 Interpreting the Behavior of Accumulation Functions Involving Area
- 6.6 Applying Properties of Definite Integrals
- 6.7 The Fundamental Theorem of Calculus and Definite Integrals
- 6.8 Finding Antiderivatives and Indefinite Integrals: Basic Rules and Notation
- 6.9 Integrating Using Substitution
- 6.10 Integrating Functions Using Long Division and Completing the Square
- 6.14 Selecting Techniques for Anti-differentiation

Unit 7: Differential Equations (14 Days)**Exam Weight 6-12%**

7.1 Modeling Situation with Differential Equations
7.2 Verifying Solutions for Differential Equations
7.3 Sketching Slope Fields
7.4 Reasoning Using Slope Fields
7.6 Finding General Solutions Using Separation of Variables
7.7 Finding Particular Solutions Using Initial Conditions and Separation of Variables
7.8 Exponential Equations

Fourth 9 Weeks (46 Days)

Unit 8 Applications of Integration (23 Days)

Exam Weight 10-15%

8.1 Finding the Average Value of a Function on an Interval
8.2 Connecting Position, Velocity, and Acceleration Functions Using Integrals
8.3 Using Accumulation Functions and Definite Integrals in Applied Contexts
8.4 Finding the Area Between Curves Expressed as a Function of x
8.5 Finding the Area Between Curves Expressed as a Function of y
8.6 Finding the Area Between Curves That Intersect at More Than Two Points
8.7 Volumes with Cross Sections: Squares and Rectangles
8.8 Volumes with Cross Sections: Triangles and Semicircles
8.9 Volume with Disc Method: Revolving Around the x - or y -axis
8.10 Volume with Disc Method: Revolving Around Other Axes
8.11 Volume with Washer Method: Revolving Around the x - and y -axis
8.12 Volume with Washer Method: Revolving Around Other Axes

AP Review (15 Days)

AP Exam :

Spring Final Exam and Review