AP Calculus BC Curriculum Map
Fall Semester

The fall semester of AP Calculus BC is intended for students who have already completed AP Calculus AB or an equivalent calculus course. It is not intended for students who are taking calculus for the first time. It provides a thorough review of AB topics plus a brief introduction to some new BC topics if time permits. Some new BC topics are not introduced until the 2nd semester.

Textbook: Bock, D., Donovan, D., and Hockett, S. (2017). *Barron's AP Calculus*. 14th ed.

TOPICS & BOOK CHAPTERS, FALL SEMESTER	Duration	Month(s)
Unit 1: Functions Chapter 1: Definition of Functions, Special Functions, Polynomial and Other Rational Functions, Trigonometric Functions, Exponential and Logarithmic Functions	1 wk	Aug
Unit 2: Limits and Continuity Chapter 2: Definitions and Examples, Asymptotes, Theorems on Limits, Limit of a Quotient of Polynomials, Other Basic Limits, Continuity	1 wk	Sept
Unit 3: Differentiation Chapter 1: Parametrically Defined Functions* Chapter 3: Definition of Derivative, Formulas, The Chain Rule (Derivative of Composite Function), Differentiability and Continuity, Estimating a Derivative Numerically, Estimating a Derivative Graphically, Derivatives of Parametrically Defined Functions*, Implicit Differentiation, Derivative of the Inverse of a Function, Mean Value Theorem, Indeterminate Forms and L'Hôpital's Rule, Recognizing a Given Limit as a Derivative	1 wk	Sept
Unit 4: Applications of Differential Calculus Chapter 1: Polar Functions* Chapter 4: Slope, Critical Points, Tangents to a Curve, Increasing and Decreasing Functions, Maximum, Minimum, Concavity, Inflection Point, Global Maximum, Global Minimum, Sketching, Optimization, Relating a Function and Its Derivatives Graphically, Motion Along a Line, Motion Along a Curve*, Velocity Vector, Acceleration Vector, Tangent-Line Approximation, Related Rates, Slope of a Polar Curve	2 wks	Sept
Unit 5: Antidifferentiation Chapter 5: Antiderivatives, Basic Formulas, Integration by Partial Fractions*, Integration by Parts*, Applications of Antiderivatives, Differential Equations	2 wks	Oct
Unit 6: Definite Integrals Chapter 6: Fundamental Theorem of Calculus, Definition of Definite Integral, Properties of Definite Integrals, Integrals Involving Parametrically Defined Functions*, Limit of a Sum, Riemann Sums, Approximations of the Definite Integral Using Rectangles and Trapezoids, Comparing Approximate Sums, Graphing a Function from Its Derivative, Interpreting the Natural Logarithm Function as an Area, Average Value	2 wk	Oct
Unit 7: Applications of Integration to Geometry Chapter 7: Area, Area Between Curves, Area Using Symmetry, Volume of Solids with Known Cross Sections, Volume of Solids of Revolution, Arc Length*, Improper Integrals*	2 wks	Nov
Unit 8: Further Applications of Integration Chapter 8: Motion Along a Straight Line, Motion Along a Plane Curve*, Applications of Riemann Sums, Definite Integral of a Rate, Net Change	1 wk	Nov
Unit 9: Differential Equations Chapter 9: Basic Definitions, Slope Fields, Euler's Method*, Solving First-Order Differential Equations Analytically, Exponential Growth and Decay, Restricted Growth, Logistic Growth*	2 wks	Nov-Dec
Unit 10: Semester Review Free Response Practice, Calculator and Non-Calculator Strategies, Applications	2 wks	Dec

*BC topic if time permits