

Walter Payton College Prep
AP Calculus BC Course Outline

Textbook: Calculus from Graphical, Numerical, and Symbolic Points of View (Ostebee & Zorn)

For more information of the College Board's AP Calculus AB learning objectives see the College Board website: <https://apstudent.collegeboard.org/apcourse/ap-calculus-bc>

Quarter 1:

Topics:

- Elementary functions from a graphical and algebraic perspective
- The derivative of functions from a graphical perspective
- The derivative function from a numeric perspective using the TI nspire.
- Justifying derivative functions derived graphically
- Conjecturing and testing antiderivatives
- Solving Differential Equations and Initial Value Problems
- Special derivative rules of the elementary functions.
- Evaluating limits that are disguised derivatives
- Finding derivatives of products, quotients, and composite functions.
- Implicit differentiation
- Derivatives of inverse trigonometric functions

Quarter 2:

Topics:

- L'Hospital's Rule
- Slope fields
- Euler's Method
- Solving DEs using separation of variables
- Optimization
 - The fun Snell's law fish tank demo goes here
- Parametric derivatives
- Related Rates
- Intro to Taylor series
- Intermediate Value Theorem
- Mean Value Theorem
- Area functions and integrals
- Fundamental Theorem of Calculus
- Substitution method of integration

Quarter 3:

Topics:

- Riemann Sums and area approximations
- Arc length, areas, and volumes
- Vector-valued functions
- Polar coordinates and their derivatives
- Integration techniques: by parts and partial fractions
- Taylor Polynomials and the Lagrange error bound analysis.
- Improper Integrals: comparison and p-tests

Quarter 4:

Topics:

- Sequences and series
- Tests of convergence; absolute versus conditional convergence
- Power series as functions