Course Description: AP Calculus BC

In AP Calculus BC, students study functions, limits, derivatives, and integrals as well as sequences, series, and vectors. Throughout the course students write and work with functions represented by written descriptions, mathematical rules, graphs and tabular data. Throughout the course, students are develop and exercise skills using the graphing calculator to solve problems, experiment, interpret their results, and support their conclusions. Students learn the meaning of the derivative and apply it to a variety of problems, while developing a deeper understanding of the meaning of the solutions to those problems. Students study integrals and learn the relationship between the derivative and the definite integral, using written work and graphing technology to explore and interpret this relationship. Students learn how calculus is used to model real-world phenomena by using functions, differential equations, integrals, and graphing technology to solve problems, support their solutions, and interpret their findings. AP Calculus BC is the equivalent of an introductory college-level calculus course and prepares students for the AP Exam and further studies in science, engineering, and mathematics.

Course Content (directly in line with College Board's Topic Outline for Calculus BC)
Prerequisites for Calculus: Linear, polynomial, exponential, logarithmic, and trigonometric functions, and Parametricequations

1. Limits and Continuity
2. Derivatives and their Applications
   - Basic differentiation rules
   - Implicit differentiation
   - Derivatives of exponential, logarithmic, trigonometric, and inverse trigonometric functions
   - Velocity and rate of change
   - Extreme values of functions
   - Modeling and optimization
   - Linearization and differentials
   - Related rates
3. Integrals and their Applications
   - Rectangular and trapezoidal approximations
   - Definite integrals and area
   - Fundamental Theorem of Calculus
   - Net change
   - Area, volume, and lengths of curves
   - Integrals in science and statistics
4. Differential Equations and Mathematical Modeling
   - Slope fields and Euler's Method
   - Integration by substitution and by parts
   - Exponential growth/decay and logistic growth
5. Sequences, L'Hopital's Rule, and Improper Integrals
6. Infinite Series
7. Parametric, Vector, and Polar Functions

Textbooks: Finney, Demana, Waits, Kennedy (2011). Calculus: Graphical, Numerical, Algebraic. 4th Ed.:Pearson/Prentice Hall
Barron's AP Calculus, 11th Ed. (2012)
Prerequisites: AP Calculus AB with a "C" or above or Honors Precalculus with an "A" and Teacher Recommendation

High Bluff Academy is accredited by the Western Association of Schools and Colleges (WASC). The above course is approved by the University of California system (A-G) and the National Collegiate Athletic Association (NCAA).