

Department: Mathematics
Course Name: AP Calculus BC

Course Description:

AP Calculus BC is roughly equivalent to both first and second semester college calculus courses and extends the content learned in AB to different types of equations and introduces the topic of sequences and series. The AP course covers topics in differential and integral calculus, including concepts and skills of limits, derivatives, definite integrals, the Fundamental Theorem of Calculus, and series. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections among these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions. An emphasis on critical thinking, complex communication, collaboration, creativity, and risk-taking while promoting a global perspective will prepare students for rigorous college work.

Content:

Functions and graphs
Limits and continuity
The derivative
Applications of derivatives
Integration
Applications of integrals
Exponential, logarithmic and inverse trigonometric functions
Principles of Integral Evaluation
Mathematical modeling with differential equations
Infinite series
Parametric, polar and vector valued functions

Skills:

Analyze graphs
Solve mathematical problems: verbally, graphically, algebraically and using tables
Calculate derivatives
Apply the concept of derivative to solve real world problems
Calculate integrals
Numerically approximate definite integrals
Apply the concept of an integral to real world problems
Model real world situations with differential equations
Approximate the solutions to differential equations graphically using slope fields
Approximate the solutions to differential equations in tabular form using Euler's method
Use calculus to solve problems expressed in parametric, polar, or vector forms
Solve problems using Taylor series
Use Taylor series to model real world situations

Text and Materials:

Anton, Bivens, Davis, et.al., Calculus (John Wiley and Sons, 9th ed., 2009)

Methods of Instruction:

Lecture

Small group discussion

AP classroom videos, progress checks

Worksheets

Videos

Online homework assignments

Interactive computer algebra systems Wolfram Alpha and Desmos

Methods of Evaluation:

Tests

Quizzes

Online assessments

Homework

