BOARD APPROVED: 08/14/2013 **Department: Mathematics**

Advanced Placement Calculus BC **Pre-requisite: AP Calculus AB**

AP CALCULUS BC CURRICULUM SUMMARY

The purpose of the summary is to present an overview of the curriculum. Parents, community, and teachers of other disciplines are the intended audience of the curriculum summary.

Indeterminate Form, Limits, and Integration
- Integration by parts - Partial fractions - L'Hopital's Rule - Rates at which functions grow - Improper integrals

Power Series
- Polynomial approximations - The error in a Taylor Polynomial (LaGrange Error) - Power series - Functions represented by power series - Taylor and Maclaurin Series

Infinite Series
- Sequences - Convergent and divergent series - Geometric series - Series in telescoping form - The nth term test for divergence - The Integral Test - P-series - Direct comparison test - Limit comparison test - Alternating series test - Alternating series remainder - Absolute and conditional convergence - The ratio test - The root test

Parametric and Polar Equations and Graphs
- Sketch the curve of a parametric equation - Transform between parametric and rectangular equations - Derivates in parametric - Arc length and surface area in parametric - Physics vector applications of parametric - Graph polar coordinates and equations - Transform between polar and rectangular equations - Derivatives in polar - Tangents in polar - Area and arc length in polar - Intersection vs. collision points in polar

Limits and Derivatives
- Limits graphically , numerically and analytically - One sided limits and continuity - Infinite Limits - Definition of derivative - Basic derivative rules - Product and quotient rules - Chain rule - Implicit differentiation - Related rates - Optimization problems - Extrema - Increasing, decreasing and first derivative - Concavity and second derivative - Theorems related to derivatives - Physics problems applications - Limits at infinity - Newton's method

More Limits and Derivatives
- Derivative of natural log - Logarithmic differentiation - Derivatives of inverse functions - Derivative of e^x - Derivative with bases other than e - Derivatives of inverse trig functions