Allen Academy

Calculus BC

Course Clarification

As a continuation of AP Calculus AB, the following topics define the AP Calculus BC course. Altogether, AP Calculus is taught over the course of three trimesters, A/B/C, which are divided into sections AB / BC.

Topics Covered:	Topics Covered:	Topics Covered:
Integration Techniques, L'Hopital's Rule, Improper Integrals - Review of basic integration methods - Integration by parts : linear factors, tabular method - Trigonometric integrals - Integration by partial fractions - Trigonometric substitution - Powers of trig functions - Logistic differential equations model - L'Hopital's Rule and using it to determine limits - Improper integrals and their convergence and divergence, with L'Hopital's Rule included	**Sequences and Series** - Definition of a sequence - Convergence and divergence of sequences - Definition of a series as a sequence of partial sums - Partial sums as they pertain to convergence of a series - Nth Term test for divergence - Geometric Series Test for convergence and divergence - Integral Test and P-Series Test: relate integral test to improper integrals and also to P-Series - Direct Comparison Test , Limit Comparison Test - Alternating Series Test, Alternating Series remainder Absolute and Conditional Convergence - The Ratio and Root Tests - Taylor polynomials and approximations: Use graphing calculator lab to introduce - Power Series radius of convergence interval of convergence testing endpoints for convergence or divergence - Taylor and Maclaurin Series for given functions - Manipulation of series Addition of series, multiplication of series by constant or variable,	**Plane Curves, Parametric Equations, and Polar Curves** - Plane curves and parametric equations - Graphing and orienting the path of a curve - Finding first and second derivatives of functions in parametric form - Parametric equations and vectors: motion along a curve, position, velocity, acceleration, speed, distance traveled - Analysis of curves given in parametric and vector form - Arc Length in parametric form - Polar coordinates and polar graphs - Arc Length in polar form - Area bounded by a polar curve - Area of a region formed by two polar curves

	differentiating a series, integration of a series - Taylor's Theorem with the Lagrange Form of the Remainder	

Instructional Resources:

- Textbook: *Calculus of a Single Variable, Eighth Edition* by Larson, Hostetler, and Edwards