

Analytical Geometry and Calculus 1

A year-long course covering the topics covered in a typical one-semester college course.

Prerequisites: Algebra 2 with a C or better

Trigonometry taken prior to or concurrently with Calculus

Topics covered:

Exponential functions

Logarithms

Limits (left, right, and 2-sided)

Vertical asymptotes

Evaluating Limits

Continuity

Horizontal asymptotes

Instantaneous rates of change

Tangent lines

Definition of derivative

Differentiation:

Power rule

Product and quotient rules

Chain rule

Rates of change

Implicit differentiation

Second derivative

Exponentials

Inverse Trig functions

Logarithms

Related rates

Linear approximation – Newton's method

Absolute and local maximums and minimums

First derivative test

Mean value theorem

Increasing-Decreasing functions

Concavity, inflection points

Second derivative test

Max/Min word problems

Antiderivatives

Definite integral

Fundamental theorem of Calculus

Indefinite integrals

Areas between curves

Volumes (washers, cross sections)

Volumes (cylindrical shells)