

**Math 1261**  
**Survey of Calculus**  
**Master Syllabus**  
**Valdosta State University**  
**Mathematics Department**

Math 1261 is a 3 credit hour course.

Prerequisites:

Math 1101(Math Modeling) or Math 1111(College Algebra) with a grade of C or better)

Course Description:

This course is an introduction to basic calculus with emphasis on applications in

## General Outline of Topics

### 1.) Functions and Graphs.

Graphs of functions including Quadratic, Rational, Exponential, and Logarithm functions

Identify asymptote lines

Applications of Exponential and Logarithm functions including growth, decay, compound interest, investment, and half-life.

### 2.) Limits and Derivatives

Analysis of a limit & One-sided limits.

Limit Properties

Difference Quotient

Limits to infinity and Infinite limits

Continuity & Partition Number

Average & Instantaneous Rate of Change

Slope of the tangent line

Sales Analysis

Differentiation Properties – Power Rule, Sum & Difference

Instantaneous velocity

Marginal Analysis

Cost, Revenue, Profit functions

Exact, Marginal, and Average Cost, Revenue & Profit

### 3.) Additional Derivative Topics

Graphing Growth functions

Derivatives of Exponential and Logarithm functions

Review of Logarithm Laws and Properties

Product and Quotient Rules with Applications

The Chain Rule

Implicit Differentiation

### 4.) Graphing and Higher Derivatives

Increasing & Decreasing Intervals on a graph

Local Extrema and Critical numbers

2<sup>nd</sup> & Higher Derivatives

Graphs using the 2<sup>nd</sup> Derivative

Inflection Points & Curve Sketching

L'Hopitals Rule

Absolute Maxima and Minima

Extreme Value Theorem