

## MA 121 Calculus for Business and Life Sciences I

### Course Description: (3)

Differential Calculus as applied to engineering, business, economics and the management, life, and social sciences.

### Course Objectives:

- Business, life science, and engineering technology students will learn applied concepts of differential calculus
- Students will become fluent in concepts of limits and continuity
- Students will be able to conceptualize and explain average and instantaneous rates of change
- Students will understand derivative mechanics
- Students will apply derivative functions to real world applications.

### Course Content:

#### **Introduction**

Review of functions and their graphs  
The Straight Line and Linear Functions  
Applications of the Straight Line Quadratic Functions  
Graphs

#### **Limits, Continuity, and Rates of Changes**

Limits  
Infinity in Limits  
Continuity Average and Instantaneous Rates of Change

#### **The Derivative**

Definition of the Derivative Basic  
Rules of Differentiation  
Further Techniques of Differentiation:  
Products, Quotients, and Rational Powers  
Marginal Analysis in Business and Economics  
The Chain Rule  
Related Rates Problems  
Implicit Differentiation

#### **Applications of the Derivative**

Increasing and Decreasing Functions  
Relative Extreme Values of Functions  
Absolute Extreme Values of Functions  
The Second Derivatives  
Applications to Curve Sketching  
Additional Techniques for Curve Sketching

### **ACCOMMODATION STATEMENT:**

In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, the University offers reasonable accommodations to students with eligible documented learning, physical and/or psychological disabilities. Under Title II of the Americans with Disabilities Act (ADA) of 1990 and Section 504 of the Rehabilitation Act of 1973, a disability is defined as a physical or mental impairment that substantially limits one or more major life activities as compared to an average person in the population. It is the responsibility of the student to contact *Developmental Services* prior to the beginning of the semester to initiate the accommodation process and to notify instructors within the first three class meetings to develop an accommodation plan. Appropriate, reasonable accommodations will be made to allow each student to meet course requirements, but no fundamental or substantial alteration of academic standards will be made. Students needing assistance should contact *Developmental Services*.

**UNIVERSITY OF NORTH ALABAMA**