Prerequisites: **Take One Set:**  Set 1: DMA 010, 020, 030, 040, 050, 060, 070, 080  
Set 2: MAT 121; minimum grade of “C”

Corequisites: None

This course is designed to develop topics which are fundamental to the study of Calculus. Emphasis is placed on solving equations and inequalities, solving systems of equations and inequalities, and analysis of functions (absolute value, radical, polynomial, rational, exponential, and logarithmic) in multiple representations. Upon completion, students should be able to select and use appropriate models and techniques for finding solutions to algebra-related problems with and without technology. Course Hours per Week: Class, 3. Lab, 2. Semester Hours Credit, 4.

**This is a Universal General Education Transfer Component (UGETC) course**

**LEARNING OUTCOMES:**

1. Use analytical, graphical, and numerical representations to solve absolute value, radical, polynomial, rational, exponential, and logarithmic equations with both real and complex solutions.
2. Use analytical, graphical, and numerical representations to solve absolute value, polynomial and rational inequalities with real solutions.
3. Use analytical, graphical, and numerical representations to analyze absolute value, radical, polynomial, rational, exponential and logarithmic functions with both real and complex zeros.
4. Use multiple methods to solve problems involving systems of equations and apply to decomposing partial fractions.
5. Construct the composition and inverse of functions.
6. Use polynomial, exponential and logarithmic functions to model various real world situations in order to analyze, draw conclusions, and make predictions.

**OUTLINE OF INSTRUCTION**

I. Graphs  
   A. Solving Rational Equations  
   B. Solving Absolute Value Equations and Inequalities  
   C. Rectangular Coordinates; Graphing Utilities  
   D. Introduction to Graphing Equations  
   E. Intercepts; Symmetry; Graphing Key Equations
II. Functions and Their Graphs
   A. Functions
   B. The Graph of a Function
   C. Properties of Functions
   D. Library of Functions; Piecewise-defined Functions
   E. Graphing Techniques: Transformations
   F. Mathematical Models: Building Functions

III. Linear and Quadratic Functions
   A. Linear Functions, Their Properties, and Linear Models
   B. Systems of Linear Equations
   C. Building Linear Models from Data
   D. Completing the Square
   E. Quadratic Functions and Their Properties
   F. Building Quadratic Models from Verbal Descriptions and from Data
   G. Inequalities Involving Quadratic Functions
   H. Complex Numbers

IV. Polynomial and Rational Functions
   A. Polynomial Functions and Models
   B. The Real Zeros of a Polynomial Function
   C. Complex Zeros; Fundamental Theorem of Algebra
   D. Properties of Rational Functions
   E. The Graph of a Rational Function
   F. Polynomial and Rational Inequalities

V. Exponential and Logarithmic Functions
   A. Composite Functions
   B. One-to-One Functions; Inverse Functions
   C. Exponential Functions
   D. Logarithmic Functions
   E. Properties of Logarithms
   F. Logarithmic and Exponential Equations
   G. Financial Models
   H. Exponential Growth and Decay Models
   I. Building Exponential and Logarithmic Models from Data

REQUIRED TEXTBOOK:

CALCULATOR:
TI-83/84 Graphing Calculator