

MAT 121 Algebra/Trigonometry I

COURSE DESCRIPTION:

Prerequisite(s):

Take One Set:

Set 1: DMA-010, DMA-020, DMA-030, DMA-040, DMA-050

Set 2: DMA-025, DMA-040, DMA-050

Set 3: DMA-025, DMA-045

Set 4: DMA-010, DMA-020, DMA-030, DMA-045

Set 5: MAT-003

Set 6: BSP-4003

Corequisite(s): Take MAT-021

This course provides an integrated approach to technology and the skills required to manipulate, display, and interpret mathematical functions and formulas used in problem solving. Topics include basic geometric and proportion applications; simplification, evaluation, and solving of algebraic equations and inequalities and radical functions; complex numbers; right triangle trigonometry; and systems of equations. Upon completion, students will be able to demonstrate the ability to use mathematics and technology for problem-solving, analyzing and communicating results.

Course Hours Per Week: Class, 2. Lab, 2. Semester Hours Credit, 3.

LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Use geometric principles to solve industrial application problems involving perimeter, area, and volume
2. Employ basic algebraic operations to simplify, evaluate, and solve proportions, radical and algebraic functions, equations, and inequalities
3. Perform basic algebraic operations involving complex numbers
4. Solve applied problems using trigonometric principles involving right triangles
5. Solve applied problems using systems of equations involving two and three variables
6. Use technology to solve practical problems and communicate results

OUTLINE OF INSTRUCTION:

- I. Geometry
 - A. Lines and angles
 - B. Triangles
 - C. Quadrilaterals
 - D. Circles
 - E. Measures of Irregular Areas
 - F. Solid Geometric Figures
 - G. Applications
- II. Basic Algebraic Operations
 - A. Roots and radicals
 - B. Addition, subtraction and multiplication of algebraic expressions
 - C. Factoring special products

- D. Factoring common factors and difference of squares
 - E. Solving equations
 - F. Formulas and literal equations
 - G. Applied verbal problems
 - H. Properties of Inequalities
 - I. Solving Linear Inequalities
 - J. Ratio and Proportion
- III. Functions and Graphs
- A. Introduction to functions
 - B. Domain and range of functions
 - C. The graph of a function
- IV. Linear Equations
- A. Graphs of linear equations
 - B. Solving systems of two linear equations in two unknowns graphically
 - C. Solving systems of two linear equations in two unknowns algebraically
 - D. Solving systems of three linear equations in three unknowns algebraically
- V. Quadratic Equations
- A. Solution by factoring
 - B. The quadratic formula
 - C. The graph of the quadratic function
- VI. Exponents and Radicals
- A. Simplifying expressions with integral exponents
 - B. Fractional exponents
 - C. Simplest radical form
 - D. Addition, subtraction, multiplication and division of radicals
 - E. Solving nonlinear inequalities
- VII. The Trigonometric Functions
- A. Angles
 - B. Defining the trigonometric functions
 - C. Values of the trigonometric functions
 - D. The right triangle
 - E. Applications of right triangles
- VIII. Complex Numbers
- A. Basic definitions
 - B. Basic operations with complex numbers
 - C. Graphical representation of complex numbers
 - D. Polar form of a complex number
 - E. Exponential form of a complex number

REQUIRED TEXTBOOK AND MATERIAL:

The textbook and other instructional material will be determined by the chair/instructor.