



**Course Name:** College Algebra

**Course Number:** MAT\*E172

**Credits:** 3

**Catalog description:** This course offers numeric, algebraic, and graphic problem solving techniques to be used in calculus. Techniques are developed to solve equations and inequalities involving polynomials, radicals and rational expressions. Polynomial, inverse, rational, exponential, and logarithmic functions are studied and their applications are explored both algebraically and graphically.

**Prerequisite:** Satisfactory score on placement exam, or MAT\*137 with a grade of C or higher within 2 years.

## **General Education Competencies Satisfied:**

**HCC General Education Requirement Designated Competency Attribute Code(s):**

QUAX                      Quantitative Reasoning

**Discipline-Specific Attribute Code(s):**

MATH                      Mathematics elective

## **Course objectives:**

### **General Education Goals and Outcomes:**

**Quantitative Reasoning:** Students will learn to recognize, understand, and use the quantitative elements they encounter in various aspects of their lives. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.

### **Course Specific Objectives:**

1. To determine and perform the different methods of solutions for various types of equations and inequalities.
2. To become proficient in algebraic techniques to be used in the study of calculus.
3. To examine functions analytically, numerically, and graphically.
4. To be able to solve equations related to those functions.
5. To translate a verbal problem into a mathematical model.
6. To utilize the available technology.
7. Evaluate the results obtained from quantitative methods for accuracy and /or reasonableness by solving problems analytically and graphically.



**Course Content:**

- **Functions**
  - Introduction to Functions
  - Functions and Function Notation
  - Domain and Range
  - Rates of Change and Behavior of Graphs
  - Composition of Functions
  - Transformation of Functions
  - Absolute Value Functions
- **Linear Functions**
  - Introduction to Linear Functions
  - Linear Functions
  - Graphs of Linear Functions
  - Modeling with Linear Functions
  - Fitting Linear Models to Data
- **Polynomial and Rational Functions**
  - Introduction to Polynomial and Rational Functions
  - Complex Numbers
  - Quadratic Functions
  - Power Functions and Polynomial Functions
  - Graphs of Polynomial Functions including Intermediate Value Theorem
  - Dividing Polynomials: Synthetic Division and Long Division of Polynomials
  - Zeros of Polynomial Functions including Fundamental Theorem of Algebra and Rational Zeros Theorem
  - Rational Functions
  - Solving Inequalities: Linear, Absolute Value, Quadratic, and Rational
  - Modeling Using Variation
  - Inverse Functions
- **Exponential and Logarithmic Functions**
  - Introduction to Exponential and Logarithmic Functions
  - Exponential Functions
  - Graphs of Exponential Functions
  - Logarithmic Functions
  - Graphs of Logarithmic Functions
  - Logarithmic Properties
  - Exponential and Logarithmic Equations
  - Exponential and Logarithmic Models
  - Fitting Exponential Models to Data

Course Created: SP 2013

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