Course Name: Intermediate Algebra

Course Number: MAT*E137

Credits: 3

Catalog description: This course is a further study of algebra and mathematical modeling of functions and relations represented by tables, graphs, words, and symbols. Polynomial functions and expressions with special attention to linear, quadratic, exponential, rational, and radical functions are studied. There is an emphasis on modeling and applications for all topics.

Prerequisite: Satisfactory score on mathematics placement exam or a grade of C or better in MAT*095, MAT*095I

Course objectives:

General Education Competencies Satisfied:

HCC General Education Requirement Designated Competency Attribute Code(s):
None

Discipline-Specific Attribute Code(s):

☒ **MATH**   **Mathematics elective**

General Education Goals and Outcomes:

None

Course Specific Objectives:

1) Exhibit perseverance, ability, and confidence to use mathematics to make sense of and solve problems
2) Perform mental arithmetic and use proportional reasoning
3) Analyze problem situations through numerical, graphical, symbolic and/or verbal approaches and modeling
4) Use appropriate tools strategically in solving problems
5) Recognize patterns, draw inferences
6) Communicate and interpret results
7) Demonstrate an understanding and appreciation of the usefulness of mathematics in everyday life

Course Content:

1) **Linear Functions**
   a) Provide multiple representations (e.g., words, symbols, graphs, tables) of linear functions by hand and/or using technology
   b) Determine identifying characteristics of linear functions
   c) Model and solve real world applications with linear functions (e.g., car depreciation) and systems of linear equations

2) **Quadratic Functions and/or Expressions**
   a) Provide multiple representations (e.g., words, symbols, graphs, tables) of quadratic functions or expressions by hand and/or using technology
   b) Determine identifying characteristics of quadratic functions or expressions (e.g., factors)
   c) Evaluate, simplify, and perform operations on quadratic functions or expressions
   d) Solve quadratic equations algebraically (e.g., factoring, completing the square, and quadratic formula with rational solutions) and/or graphically
   e) Solve real world applications involving quadratic equations and functions

3) **Exponential Functions and/or Expressions**
   a) Provide multiple representations (e.g., tables, graphs, symbols) of exponential functions or expressions by hand and/or using technology
   b) Determine identifying characteristics of exponential functions or expressions
   c) Evaluate, simplify, and perform operations on exponential functions or expressions
   d) Identify exponential functions within real world applications

4) **Rational Functions and/or Expressions**
   a) Provide multiple representations (e.g., words, symbols, graphs, tables) of simple rational functions or expressions by hand and/or using technology
   b) Determine identifying characteristics of rational functions or expressions
   c) Evaluate, simplify, and perform operations on simple rational functions or expressions
   d) Solve simple rational equations algebraically and/or graphically
   e) Solve real world applications involving rational functions

5) **Radical Functions and/or Expressions**

a) Provide multiple representations (e.g., words, symbols, graphs, tables) of simple radical functions or expressions by hand and/or using technology, with primary emphasis on square root
b) Determine identifying characteristics of radical functions or expressions
c) Evaluate, simplify, and perform operations on simple radical functions or expressions
d) Solve simple radical equations algebraically and/or graphically
e) Solve real world applications involving radical functions
f) Identify imaginary numbers

Optional Topics :

6) **Degree 3 or Higher Polynomial Functions and/or Expressions**
   a) Provide multiple representations (e.g., words, symbols, graphs, tables) of degree 3 or higher polynomial functions or expressions
   b) Evaluate, simplify, and perform operations on degree 3 or higher polynomial functions or expressions
   c) Determine identifying characteristics of degree 3 or higher polynomial functions or expressions
   d) Solve degree 3 or higher polynomial equations algebraically (factoring) and/or graphically
   e) Solve real world applications involving degree 3 or higher polynomial functions

7) **Logarithmic Functions**
   a) Provide multiple representations of logarithmic functions or expressions
   b) Determine identifying characteristics of logarithmic functions or expressions
   c) Evaluate, simplify, and perform operations on logarithmic functions or expressions
   d) Solve logarithmic equations algebraically and/or graphically
   e) Solve real world applications involving logarithmic functions

8) **Other Optional Topics**
   a) Absolute Value Functions, Equations, Inequalities
   b) Quadratic Inequalities
   c) Solve Systems of Linear Inequalities
   d) Solve Systems of Quadratic Equations
   e) Solve Systems of Rational Equations
   f) Conic Sections

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