

Prepared by the Department of Mathematics

Date of Departmental Approval: January 29, 2014

Date approved by Curriculum and Programs: February 19, 2014

Effective: Fall 2014

**1. Course Number: MAT041**

**Course Title: Elementary Algebra for STEM**

**2. Description:** This course introduces the basic concepts in algebra necessary for students who plan to take intermediate algebra for STEM (Science, Technology, Engineering, and Mathematics). Topics include: properties and operations on real numbers, linear equations, interval notations, inequalities, absolute value, graphing, function notations, linear systems, exponents, polynomials, factoring, and word problem analysis. (4 contact hours)

**3. Student Learning Outcomes (instructional objectives, intellectual skills):**

Upon successful completion of this course, students are able to do the following.

- Apply order of operations correctly
- Operate with signed numbers in equations and application problems
- Solve linear and absolute value equations
- Solve absolute value inequalities and express the solution sets in interval notations
- Graph linear equations and inequalities in two variables
- Solve a system of linear equations both algebraically and graphically
- Combine polynomials through addition, subtraction, multiplication and division
- Factor simple polynomials
- Solve quadratic equations by factoring
- Solve application problems algebraically

**4. Credits:** Three non-degree credits

**5. Satisfies General Education Requirement:** No

**6. Prerequisite:** MAT025 or satisfactory basic skills assessment score

**7. Semesters Offered:** Fall, Spring, Summer

**8. Suggested General Guidelines for Evaluation:** Assessments include departmental final examination, homework, tests, and quizzes. Grading yields a Pass/Fail/Retake or letter grade of C- or higher.

**9. General Topical Outline:**

I. Review Concepts of Arithmetic

- A. Order of operations
- B. Real numbers
- C. Basic operations of real numbers
- D. Simplifying expressions

II. Review Linear Equations and Applications

- A. Solving linear equations
- B. Applied problems
- C. Formulas and geometry applications
- D. Ratio, proportion, and percent

III. Linear Inequalities and Absolute Value

- A. Linear inequalities in one variable
- B. Set operations and compound inequalities
- C. Absolute value equations and inequalities

- IV. Linear Equations and Inequalities in Two Variables
  - A. The rectangular coordinate system
  - B. The slope of a line
  - C. Linear equations in two variables
  - D. Linear inequalities in two variables
  - E. An introduction to functions
  - F. An application of functions: variation
  
- V. Systems of Linear Equations
  - A. Solving systems of linear equations by graphing
  - B. Solving systems of linear equations by elimination
  - C. Solving systems of linear equations by substitution
  - D. Applications of linear systems
  
- VI. Exponents and Polynomials
  - A. Rules for exponents
  - B. Addition and subtraction of polynomials
  - C. Multiplication of polynomials
  - D. Product patterns and dividing by monomials
  - E. The quotient of two polynomials
  
- VII. Factoring
  - A. Factors; the greatest common factor
  - B. Factoring trinomials
  - C. Special factorizations
  - D. Solving quadratic equations by factoring
  - E. Applications of quadratic equations