

Prepared by the Department of Mathematics  
Date of Departmental Approval: September 15, 2014  
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Effective: Fall 2015

1. **Course Number:** MAT025  
**Course Title:** Pre-Algebra
2. **Description:** A fundamental course in prerequisite algebraic topics designed to help prepare students for the study of introductory algebra and its applications. Topics include: introduction to, operation with, and application of whole numbers, integers, fractions, and decimals; exponentiation, rooting, order of operations, ratios, rates, proportions, unit conversions, percents and their applications; an introduction to algebraic expressions and equations, applications of algebraic expressions and equations, geometry, and measurement. (5 contact hours)
3. **Student Learning Outcomes** (instructional objectives, intellectual skills):  
Upon successful completion of this course, students are able to do the following.
  - Perform addition, subtraction, multiplication, and division with whole numbers, integers, fractions, mixed numbers, and decimals.
  - Evaluate applied whole number, integer, fraction, decimal, and percent word problems.
  - Evaluate ratios, rates, and proportions.
  - Evaluate percent notation.
  - Convert between whole numbers, integers, fractions, decimals, and percents.
  - Perform order of operations.
  - Apply rounding and estimation.
  - Evaluate exponents.
  - Evaluate algebraic expressions and formulas.
  - Solve simple equations.
  - Solve multi-step equations.
  - Solve equations involving fractional terms.
  - Solve equations involving decimal terms.
  - Evaluate square roots
  - Convert between and within English/American and metric units of measure.
  - Evaluate geometric areas and perimeters.
  - Interpret and graph ordered pairs.
  - Evaluate scientific notation.
  - Define math vocabulary.
  - Apply study skills.
  - Solve application problems.
4. **Credits:** 3 non-degree credits
5. **Satisfies General Education Requirement:** No
6. **Prerequisite:** MAT010 or satisfactory basic skills assessment score
7. **Semesters Offered:** Fall, Spring, Summer
8. **Suggested General Guidelines for Evaluation:** Grading yields a Pass/Fail/Retake or letter grade of **C-** or higher. Students who remain active in the course through to its conclusion, but fail to achieve the required level of proficiency, may at the instructor's discretion, be eligible for the "R" grade.
9. **General Topical Outline** (Optional):
  - I. Whole Numbers
    - A. Introduction to whole numbers
    - B. Addition of whole numbers
    - C. Subtraction of whole numbers
    - D. Multiplication of whole numbers
    - E. Division of whole numbers
    - F. Exponentiation of whole number base

- G. Rooting involving whole number radicands and solutions
  - H. Rounding and estimating with whole numbers
  - I. Order of operations
  - J. Geometric applications of whole numbers
  - K. Further applications of whole numbers (tables, bar graphs, ordered pairs, and graphing grids)
- II. Integers
- A. Introduction to integers
  - B. Addition of integers
  - C. Subtraction of integers
  - D. Multiplication of integers
  - E. Division of integers
  - F. Exponentiation of whole integer bases
  - G. Rooting involving integer radicands and solutions
  - H. Rounding and estimating with integers
  - I. Order of operations
  - J. Applications of integers
- III. Algebraic Expressions and Linear Equations
- A. Introduction to variables, terms, like terms, and unlike terms
  - B. Introduction to expressions
  - C. Simplifying expressions
  - D. Evaluating algebraic expressions and formulas.
  - E. Distributive properties
  - F. Introduction to equations
  - G. Verifying solutions of equations
  - H. Solving equations by means of the addition property of equality
  - I. Solving equations by means of the multiplication property of equality
  - J. Solving multi-step equations
  - K. Translating English phrases to expressions
  - L. Translating English sentences to equations
  - M. Applications of equations
- IV. Fractions
- A. Introduction to fractions
  - B. Reducing fractions
  - C. Improper fractions and mixed numbers
  - D. Multiplication and division of fractions
  - E. Adding and subtracting like fractions
  - F. Least common denominator and determining equivalent fractions
  - G. Addition and subtraction of unlike fractions
  - H. Operations on mixed numbers
  - I. Algebraic fractions
  - J. Complex fractions
  - K. Order of operations
  - L. Applied problems involving fractions
  - M. Solving equations involving fractional terms
- V. Decimals
- A. Introduction to decimals
  - B. Decimal notation
  - C. Conversion of notations
  - D. Ordering and rounding decimals
  - E. Addition of decimals
  - F. Subtraction of decimals
  - G. Multiplication of decimals
  - H. Division of decimals
  - I. Order of operations
  - J. Applied problems involving decimals
  - K. Introduction to irrational numbers
  - L. Introduction to real numbers
  - M. Solving equations involving decimal terms

## VI. Ratios, Rates, Proportions, and Measurement

- A. Introduction to ratios
- B. Introduction to rates and unit rates
- C. Introduction to proportions
- D. Solving proportions
- E. Applications of proportions
- F. American system of measurement
- G. Metric system of measurement
- H. American – Metric conversions and temperature
- I. Scientific notation
- J. Applied measurement problems

## VII. Percent

- A. Introduction to percent
- B. Conversions between percents, decimals, and fractions
- C. Solving percent problems using equations
- D. Solving percent problems using proportions
- E. Solving percent applications, part 1: circle graphs
- F. Solving percent applications, part 2: sales tax, discounts, and net pay
- G. Solving percent applications, part 3: simple and compound interest
- H. Solving percent applications, part 4: growth and decay factors.

## VIII. Geometry

- A. Plane geometry: points, lines, and angles
- B. Triangles
- C. Rectangles, squares, parallelograms, and trapezoids
- D. Circles
- E. Perimeter and circumference
- F. Area
- G. Surface area
- H. Volume of rectangular solids
- I. Similar geometric figures
- J. Applications of geometry