COURSE TITLE: Algebra, Part I

COURSE DESCRIPTION: Algebra, 0507 is first year Algebra 1 course designed for students who show a readiness for Algebra 1. Instruction provides a review of arithmetic skills, operations with real numbers, relations and functions and methods of solving and graphing equations and inequalities, operations with polynomials, factoring and solving quadratic equations, and operations with radicals.

Prerequisite: Placement based on Placement Test scores and Math Chairperson recommendation.

COURSE REQUIREMENTS/REQUIRED MATERIALS:

A. I-Pad
B. Pencils
C. 4 Sturdy Pocket Folders
D. Red Pens
E. Calculator. I-Pad calculators will NOT be permitted on quizzes and tests I will be using a TI-84 in class.

COURSE OBJECTIVES/STUDENTS OUTCOMES:

1. The students will understand the uses of Algebra.

Upon completing this goal the students will be able to:

* evaluate numerical expressions and algebraic expressions by using the order of operations
* Write algebraic expressions from word expressions

2. Students will become familiar with the Real Number System.

Upon completing this goal the student will be able to:

*identify the subsets of real numbers and relationships among them
*Add, subtract, multiply and divide using real numbers
*find the mean, median, mode and range for given data

3. Students will learn the methods for solving equations in one variable.

Upon completing this goal the student will be able to:

*solve a linear equation in one variable
*recognize a proportion and know the technique to solve the proportion
*translate verbal sentences into linear equations and know the technique to solve equations

4. Students will discern the differences and similarities between relations and functions.

   Upon completing this goal the student will be able to:

   *graph ordered pairs on a coordinate plane
   *determine whether a given relation is a function by
      1)checking the domain of a relation
      2)applying the vertical line test to a graph
      *graph linear equations

5. Students will understand the meaning of slope and its importance in the graphing of linear equations.

   Upon completing this goal the student will be able to:

      *find the slope of a line by
      1) subtracting the coordinates of two points
      2) visually discerning the slope from a graph
      3) rearranging an equation to: y = mx + b to find the slope

      * graph a line using the slope-intercept form when given:
      1) the slope and y intercept
      2) the slope and a point on the line
      3) the y-intercept and a point on the line
      4) two points on the line

6) Students will develop skills in solving systems of equations.

   Upon completing this goal the student will be able to:

   * Solve systems of equations by graphing
   * Solve systems of equations by the addition method
   * Solve systems of equations using multiplication with the addition method

7) Student will acquire an understanding of the nature of polynomials.

   Upon completing this goal the student will be able to:

   * Add, subtract, multiply and divide polynomials
   * Simplify expressions with positive and negative exponents
   * Express numbers in scientific notation
   * Find the products and quotients of numbers expressed in scientific notation
   * Factor polynomials into prime factors
   * Factor binomials and trinomials using common factors or by using FOIL
   * Factor by grouping

8) Students will gain an understanding of the properties of radicals.

   Upon completing this goal the student will be able to:

   * Simplify square roots
   * Simplify radical expressions
   *Add, subtract, multiply, and divide radical expressions

COURSE OUTLINE:

I. Chapter 1 – The Language of Algebra
- A. Variables and expressions
- B. Order of operations
- C. Exponents and formulas
- D. Patterns and formulas
- E. Open sentences
- F. Rational numbers
- G. The distributive property

II. Chapter 2 - Operations with Real Numbers
- A. Opposites and order
- B. Addition on the number line
- C. Addition of real numbers
- D. Subtraction of real numbers
- E. Combining like terms
- F. Multiplication of real numbers
- G. Mean, Median and Mode
- H. Division of real numbers
- I. Preparing to solve equations

III. Chapter 3 - Solving Equations
- A. Addition property
- B. Multiplication property
- C. Ratio and proportion
- D. Solving percent equations
- E. Probability ratio and prediction
- F. Solving equations: more than one step
- G. Using formulas: Geometry
- H. Translation: Words to symbols (one variable)

IV. Chapter 4 - More on Solving Equations
- A. Drawing a diagram: perimeter-one variable
- B. Solving equations; variable on both sides
- C. Consecutive integer problems
- D. Solving for a variable

V. Chapter 5 - Relations and Functions
- A. Graphing ordered pairs
- B. Relations and Functions
- C. Graphing linear equations
- D. Using graphs to estimate
- E. Graphing absolute value relations

VI. Chapter 6 - Lines: Slopes and Equations
- A. Slope of a line
- B. Slope-intercept form of a line
- C. Using slope to write a linear equation
- D. Using two points to write a linear equation
- E. Direct variation
- F. Using Direct Variation

VII. Chapter 7 - Systems of Sentences
- A. Graphing systems of equations
- B. Addition method
- C. Using multiplication with the addition method

VIII. Chapter 8 – Polynomials
   A. Multiplying monomials
   B. Dividing monomials
   C. Scientific Notation
   D. Polynomials
   E. Adding and subtraction polynomials
   F. Multiplying and dividing polynomials

IX. Chapter 9 – Factoring
   A. Factoring GCF
   B. Factoring using distributive property
   C. Factoring Trinomials
   D. Factoring difference of two squares
   E. Factor by grouping

X. Chapter 10 – Radicals
   A. Simplifying radical expressions
   B. Operations with radicals