MTH 096 - ALGEBRA FOR STATISTICS   - OBJECTIVES   (revised 6/2016)

1. Sets of Numbers
1.1 Classify a given real number as being a counting or natural number, whole number, integer, rational or irrational number.

2. Properties of Real Numbers
2.1 Be able to use the Commutative, Associative, Distributive, Identity, and Inverse Properties.

3. Operations on Real Numbers
3.1 Review arithmetic operations on rational numbers.
3.2 Use the concept of absolute value as distance from zero on the real number line to determine the absolute value of real numbers.
3.3 Evaluate a given expression by applying the correct priority of operations.

4. Equation Solving Techniques
4.1 Solve first degree equations in one variable.
4.2 Solve literal equations and formulas for a single variable.

5. Exponents and Square Roots
5.1 Simplify exponential expressions with integer exponents.
5.2 Find the principal square roots and decimal approximations of the square roots of whole numbers.

6. Inequalities in One and Two Variables
6.1 Solve a linear inequality in one variable, graph the solution on the real number line and express the solution using set notation and interval notation.
6.2 Solve compound linear inequalities, graph the solution on the real number line, and express the solution using set notation and interval notation.
6.3 Graph a linear inequality in two variables on the Cartesian coordinate system.

7. The Cartesian Coordinate System
7.1 Use the Cartesian coordinate system to describe the x– and y–axes, the origin and quadrants, and determine the positions of ordered pairs.
7.2 Graph linear equations in two variables by plotting points.
7.3 Determine the x- and y-intercepts and use them to graph a linear equation.
7.4 Understand the concept of the slope of a line and use the slope formula to determine the slope of the line through two given points.
7.5 Interpret slopes as a rate of change
7.6 Determine the slopes of horizontal, vertical, parallel and perpendicular lines.
7.7 Graph linear equations in two variables by the slope-intercept method.
7.8 Write the equation of a line in slope-intercept form and in point-slope form:
    7.8a Given the slope and the y-intercept
    7.8b Given a graph with integer x- and y-intercepts
    7.8c Given the slope and a point on the line
    7.8d Given two points on the line.

8. Systems of Equations
8.1 Solve a system of linear equations in two variables graphically.
8.2 Solve a system of linear equations in two variables algebraically using substitution and addition/elimination methods.

9. Introduction to Functions
9.1 Determine whether a correspondence is a function.
9.2 Given a function described by an equation, find function outputs of specified inputs.
9.3 Given the equation of graph of a linear model with x and y, predict or estimate the value of y for a given value of x.
9.4 Manipulate and evaluate statistics formulas, particularly those involving sigma, z, x-bar and mu.

10. Applications
Creating open expressions and using those expressions to write equations involving one or two variables to solve applications will be integrated throughout this course. Examples from other disciplines will be incorporated whenever possible. The following types of applications are required.
10.1 Geometric formulas including perimeter of rectangles, squares, and triangles, and circumference of circles
10.2 Simple interest involving one rate and two rates
10.3 Motion problems solved with a <u>linear </u>equation involving one rate and two rates
10.4 Ratios
10.5 Proportions solved by cross-multiplication, including unit conversion
10.6 Linear inequalities
10.7 Number problems solved with a <u>linear </u>equation
10.8 Problems involving money
10.9 Percent problems including tax and commission
10.10 Mixture problems involving money and percent
10.11 Linear graphs including determining the equation of a line, using the graph for estimation at a given value, and using the equation to calculate a specific value
10.12 Systems of two linear equations solved algebraically