**Algebraic College Readiness Course**

**Description**

Topics for all formats include special products and factoring, rational expressions and equations, rational exponents, radicals, radical equations, quadratic equations, absolute value equations and inequalities, complex numbers, equations of lines, an introduction to the function concept, and graphing.

**Algebraic College Readiness Course Outcomes**

* Define, represent, and perform operations on real and complex numbers.
* Recognize, understand, and analyze features of a function.
* Recognize and use algebraic (field) properties, concepts, procedures (including factoring), and algorithms to combine, transform, and evaluate absolute value, polynomial, radical, and rational expressions.
* Identify and solve absolute value, polynomial, radical, and rational equations.
* Identify and solve absolute value and linear inequalities.
* Model, interpret and justify mathematical ideas and concepts using multiple representations.
* Connect and use multiple strands of mathematics in situations and problems, as well as in the study of other disciplines.
* Solve quadratic equations and applications using methods including the quadratic formula, factoring, completing the square, and extracting roots.

**Algebraic College Readiness Course Topics**

**Linear Equations and Inequalities Including Absolute Value**

1. Solve equations and inequalities including those with fractions and decimals. Express solution to inequalities using an inequality, in set form, using interval notation, graph on number line
2. Use equations to solve application problems including mixture problems, uniform motions problems, using formulas, consecutive integers, work, geometry, interest, and percent.
3. Solve compound inequalities including intersection and union. Express solution using an inequality, in set form, using interval notation, graph on number line
4. Use inequalities to solve application problems including temperature, average, interest and money.
5. Solve absolute value equations and Inequalities. Express solution using an inequality, in set form, using interval notation, graph on number line

**Factoring**

1. Common factors
2. Factor by grouping
3. Factor polynomials of the form x2 + bx + c
4. Factor polynomials of the form ax2 + bx + c
5. Special factoring – difference of two squares, perfect-square trinomials
6. Solve equations by factoring
7. Solve application problems using factoring including Pythagorean Theorem, Geometry, consecutive integers, translating.

**Linear Equations in Two Variables**

1. Determine whether a set of ordered pairs is a function
2. Use function notation; evaluate a function
3. Graph a linear equation in two variables – in standard form, in slope-intercept form, by plotting points, by using intercepts; graph horizontal and vertical lines from equation
4. Find slope of line from graph, using 2 points, from equation in slope-intercept form
5. Slopes of parallel lines, perpendicular lines, vertical lines, horizontal lines
6. Write equation of lines in both slope-intercept form and standard form, given the slope and y-intercept, the slope and a point, two points, point and parallel/perpendicular to a given line.

**Rational Expressions and Equations**

1. Simplify, add, subtract, multiply and divide rational expressions.
2. Solve rational equations including proportions, equations that result in a linear or quadratic equation, equations with no solution.
3. Solve application problems involving proportions, ratios, rate-time, and work.

**Radical Expressions and Equations**

1. Simplify, add, subtract, multiply and divide radical expressions with and without variables,

including positive/negative rational integer exponents.

b) Convert to and from scientific notions and perform calculations.

c) Solve rational equations including equations that result in a linear equation, quadratic equation, and

 no solution.

1. Solve application problems using a formula to solve to a variable.

**Quadratic Equations**

1. Simplify, add, subtract, multiply and divide complex numbers.
2. Solve quadratic equations by taking the square root, factoring, completing the square and using the quadratic formula.
3. Solve polynomial equations such as cubic equations and quartic equations.
4. Solve application problems with quadratics involving geometry, the Pythagorean Theorem, rate-time, work, height of a projectile, etc.

**Concept of a Function**

 a) Determine if a relation is a function

b) Find the domain and range of functions in different representations (table, graph, equation, function

 notation, list, words)

c) Graph linear and quadratic functions

d) Solve application problems involving functions.