**MATH 0310 Intermediate Algebra**

**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. This course carries institutional credit but will not transfer and will not be used to meet degree requirements.

**Math 0310 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.

**Math 0310 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. Factoring by grouping
3. Factoring polynomials of the form x2 + bx + c
4. Factoring polynomials of the form ax2 + bx + c
5. Special factoring – difference of two squares, perfect-square trinomials
6. Solving equations by factoring
7. Solve application problems using factoring including Pythagorean Theorem, Geometry, consecutive integers, translating.

**Linear Equations in 2 variables**

1. Determine whether a set of ordered pairs is a function
2. Using 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. Slope 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. Simplifying, Adding, Subtraction, Multiplying and Dividing rational expressions.
2. Solve Rational Equations including Proportions, equations that result in linear and quadratics, no solution.
3. Solve application problems involving proportions, ratios, rate-time, and work.

**Radical Expressions and Equations**

a) Simplifying, Adding, Subtraction, Multiplying and Dividing radical expressions with and without variables and 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 linear eqns, quadratics eqns, and no solution.

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

**Quadratic Equations**

1. Know about Complex Numbers including simplifying and performing operations on radicals involving negative numbers.
2. Add, subtract, multiply and divide complex numbers.
3. Solve quadratic equations by Square Root, Factoring, Completing the Square and Quadratic Formula.
4. Solve polynomial equations such as cubic equations and quartic equations.
5. Solve application problems with quadratics involving geometry, Pythagorean Thm, rate-time, work, height of a projectile, etc.

**Concept of a Function**

 a) Determine if a relation is a function

b) Finding Domain and Range of functions in different representations (Table, graph, Equation, Function Notation, list, words)

c) Graph Linear and Quadratic Functions

d) Solve applications problems involving functions.