Course Objectives/Course Outline
Spokane Community College

Course Title: Intermediate Algebra
Prefix and Course Number: MATH 99

Course Learning Outcomes:
By the end of this course, a student should be able to:

- Solve and graph compound inequalities, absolute value equations and inequalities in one variable.
- Solve rational and radical equations and identify extraneous solutions.
- Solve quadratic equations choosing the most appropriate method (factoring, square root property, completing the square or the quadratic formula).
- Write solutions in the appropriate notation.
- Recognize and graph linear, absolute value, rational, square root and quadratic functions.
- Recognize all forms of linear equations in two variables and use multiple ways to graph them.
- Write equations of lines in the slope-intercept, standard, and point-slope forms when given specific information.
- Determine if a relation is a function from their equations, graphs, ordered pairs, tables, etc.
- Determine the domain and range of a function from the graph or from the equation.
- Use function notation and evaluate functions.
- Factor Polynomials. This includes the GCF, Difference of Squares, Sum and Difference of Cubes, Trinomials and grouping for 4 or 6 term polynomials.
- Reduce, multiply, divide, add and subtract rational expressions.
- Simplify complex fractions.
- Solve application problems involving rational expressions including motion, work,similar triangle, proportions and variations.
- Switch notation from radicals to exponentials and back.
- Apply properties of exponents to simplify expressions involving rational exponents.
- Simplify radicals, add, subtract, multiply and divide radical expressions and rationalize denominators.
- Define complex numbers and perform operations with complex numbers (add, subtract, multiply and divide).
- Identify solutions to quadratic equations as rational, irrational or complex (real or imaginary).
- Find the coordinates of the vertex of the parabola by completing the square or by using the vertex formula.
- Find the maximum and the minimum of quadratic functions.
- Solve application problems involving quadratics.

Course Outline:

I. Functions
   A. Relations and Graphs
   B. Function Notation / Evaluate Functions
   C. Domain and Range
      i. From a graph
      ii. In interval notation

D. Function Operations
    i. Add/subtract
    ii. Multiply/Divide
E. Variation
    i. Solve applications

II. Graphs
A. Linear Graphs
    i. Graph lines
    ii. Find equations of lines
    iii. Recognize the graph.
    iv. Give domain and range
    v. Read slope and points off of graph.
    vi. Match equation to graph.
B. Absolute Value
    i. Recognize their graph
    ii. Graph by plotting points
    iii. Give domain and range from graph.
C. Rational
    i. Recognize the graph
    ii. Give domain from graph
    iii. Match equation to graph (simple)
D. Radical
    i. Recognize the graph
    ii. Give domain and range from graph.

III. Rational Expressions
(All of these topics should be covered at a higher level than in math 92 or 96)
A. Operations (Multiply, divide, add and subtract)
    i. Include ones with the sum and difference of cubes
B. Complex fractions
    i. Include ones with negative exponents
C. Equations involving rational expressions
D. Solve literal rational expressions
E. Applications
    i. Distance, rate, time
    ii. Work rate
    iii. Similar triangles
    iv. proportions

IV. Rational Exponents and Roots
A. Definition of Rational exponents
    i. Switch notation from radical to exponential
    ii. Switch notation from exponential to radical
    iii. Properties of exponents
    iv. Multiply expressions with exponents
B. Simplified form for radicals
C. Addition and subtraction of radical expressions
D. Multiplication and division of radical expressions
E. Rationalize the denominator
F. Equations with radicals
G. Solve radical literal equations
H. Complex numbers
    i. Definition
    ii. Operations (add, subtract, multiply, divide)

V. Quadratic Equations
    A. Solve by factoring
    B. Complete the square
    C. Quadratic formula
    D. Irrational and complex solutions
        i. Use the discriminate to identify
    E. Solve literal quadratic functions
    F. Equations in quadratic form
    G. Find the vertex by completing the square
    H. Accurately graph parabolas
    I. Maximize/minimize quadratic functions
    J. Applications
        i. Min/Max problems
        ii. Generate quadratic equations to solve.
        iii. Projectile problems.

VI. Additional Topics
    A. Compound inequalities
        i. Using “and” and “or”
    B. Absolute Value equations
    C. Absolute Value inequalities

- Faculty may choose to cover more topics than those on the required course outline
- Supplements containing relevant application problems will be developed