South Central College

Math 0095 Elementary and Intermediate Algebra

Common Course Outline

Course Information

Description This course is function - based. It starts with a brief overview of the number system and continues through equations and inequalities. It then proceeds to cover linear functions, polynomial and rational functions, quadratic functions, equations involving radicals, and absolute values. This course includes the latter part of Math 0075 and all of Math 0085.Mi nnesota K-12 Academic Standards in Mathematics are indicated in parentheses after each competency on the Common Course Outline. (Prerequisite: score 36 or above on the Accuplacer Arithmetic test or a score of 250 on the Arithmetic portion of the Next Generation Accuplacer.)

Total Credits 6

Total Hours 128

Types of Instruction

Instruction Type	Credits/Hours
Lecture	4/64
Lab	2/64

Pre/Corequisites

Prerequisite A score of 36 or above on the Accuplacer Arithmetic test or a score of 250 on the Arithmetic portion of the Next Generation Accuplacer.

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Use algebraic properties to evaluate polynomials. (9.2.3.1) (9.2.3.4)

Learning Objectives

Add, subtract, multiply, and divide algebraic expressions.
Use algebraic properties to evaluate expressions across the rational numbers.
Simplify polynomial expressions.
Add, subtract, multiply, and divide polynomials.
Factor common monomial factors from polynomials.
Replace variables and evaluate expressions.

2. Solve algebraic linear and rational equations. (9.2.3.4)

Learning Objectives
Generate equivalent algebraic equations.
Use algebraic properties to solve equations beginning with one step equations.
Set up and solve equations representing real-life problems.

3. Solve linear equations in two variables graphically. (9.2.4.5)

Learning Objectives
Represent real world linear equations by graphing.
Interpret graphing in the Cartesian coordinate plane.

4. Identify functions in graph and equation form. (9.2.1. - multiple areas)

Learning Objectives
Identify the important features of functions.
State the domain and range of a function.
Find the value of the function for a given point in the domain.
Graph linear and quadratic functions.

5. Identify the characteristics of the linear function and use those to graph the function. (9.2.2. - multiple areas)

Learning Objectives
Identify the slope (rate of change) of a linear function.
Identify the x and y intercepts of the linear function.
Draw conclusions from the graph of linear functions.

6. Solve linear inequalities algebraically and graphically. (9.2.4. - multiple areas)

Learning Objectives
Identify the slope and intercepts represented by the inequality.
State the solution set for the inequality in algebraic and/or interval notation.
Recognize the real world application of inequalities.

7. Solve quadratic functions using appropriate factoring techniques and with the quadratic formula. (9.2.3.3 and 9.2.4.1)

Learning Objectives
Factor second degree expressions (including trinomials, difference of two squares and binomials squared) using appropriate techniques.
Factor the sum and difference of two cubes.
Follow the general principals of factoring to factor a variety of expressions.
Use the factoring techniques to solve quadratic functions.
Correctly use the quadratic formula to solve quadratic functions.

8. Use formulas to solve situational problems, including solving the formulas for different variables. (9.3.1.1)

Learning Objectives
Apply formulas to situations and explain the conclusion.
Solve formulas for given variables.

9. Complete calculations in scientific notation and interpret the results as numbers in standard notation. (8.1.1.5 and 9.2.4.8)

Learning Objectives
Interpret scientific notation in context.
Perform calculation in scientific notation.
Utilize calculators to evaluate expressions in scientific notation.

10. Solve functions with radicals. (9.2.4.7)

Learning Objectives

Use appropriate algebraic manipulation to solve equations involving radicals.
Rewrite equations with radicals to equations with rational exponents.

11. Solve systems of linear equations with two variables. (9.2.4.5)

Learning Objectives

Solve two variable systems using graphing.
Solve two variable systems using addition.
Solve two variable systems using substitution.

12. Evaluate and simplify exponential expressions. (9.2.4.1)

Learning Objectives

Simplify exponential expressions with positive and negative exponents.
Evaluate exponential expressions with positive and negative exponents.

13. Use logarithms to solve exponential functions. (9.2.4. - multiple areas)

Learning Objectives

Convert between exponential functions and logarithmic functions.
Solve for variables in exponential and logarithmic functions.

14. Apply mathematical techniques to real life problems. (9.2.4.1)

Learning Objectives

Convert a situation to the appropriate relation and solve.
Use logarithms in scientific settings such as decibels, Richter scale, and pH measures.