



South Central College

MATH 120 College Algebra

Course Outcome Summary

Course Information

Description	This course is mainly concerned with functions, most of which are algebraic. It begins with general treatment of equations and inequalities and then proceeds to cover linear functions, quadratic functions, polynomial and rational functions, piecewise functions, equations involving radicals and absolute values, logarithms and exponentials, systems of equations and inequalities, permutations and combinations. (Prerequisites: Completion of MATH 0085 with a grade of C or higher, or an Accuplacer test score of 56 in Elementary Algebra and a score of 50 in College Level Mathematics.) (MNTC 4: Mathematical/Logical Reasoning)
Total Credits	4
Total Hours	64

Types of Instruction

Instruction Type	Credits/Hours
Lecture	4/64

Pre/Corequisites

Completion of MATH 0085 with a grade of C or higher, or an Accuplacer test score of 56 in Elementary Algebra and a score of 50 in College Level Mathematics. MNTC 4: Mathematical/Logical Reasoning

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. Transform polynomial expressions accurately

Learning Objectives

- Identify the eleven field axioms when used in expressions.
- Perform arithmetic operations on polynomials.
- Factor polynomials.

2. Transform other algebraic expressions

Learning Objectives

Perform arithmetic operations on rational expressions.
Simplify expressions containing exponents and radicals.

3. Solve linear and related equations

Learning Objectives

Solve linear equations using properties of real numbers.
Solve sets of equations in two variables by substitution
Solve equations containing absolute values.

4. Solve linear and related inequalities

Learning Objectives

Solve linear inequalities.
Solve inequalities containing absolute values.

5. Solve quadratic equations

Learning Objectives

Perform operations on complex numbers.
Solve quadratic equations using a property of square roots.
Solve quadratic equations by completing the square.
Solve quadratic equations with the quadratic formula.
Model real-world situations with quadratic equations.

6. Solve certain types of higher degree equations and inequalities.

Learning Objectives

Solve equations which are reducible to a quadratic form.
Solve polynomial and rational inequalities.
Model real-world situations with inequalities and equations of higher degree.

7. Graph elementary functions

Learning Objectives

Graph circles from their equations.
Graph linear functions.
Graph more complex functions using transformations.

8. Describe functions in terms of the formal definition

Learning Objectives

Define relations and functions precisely.
Apply the four binary arithmetic operators to combinations of functions.
Create composite functions.
Describe the relationship of a function to its inverse.

9. Describe the local and global behavior of a given polynomial

Learning Objectives

Locate special points on the graphs of polynomial functions.
Graph polynomial functions using these special points.
Define what it means for a function to be increasing or decreasing on an interval.

10. Compute the roots of polynomial equations

Learning Objectives

Find rational zeroes using the Rational Root Theorem.
Predict polynomial behavior using Descartes's Rule of Signs.
Approximate real zeroes of polynomials.

11. Specify the behavior of rational functions

Learning Objectives

Locate special points on the graphs of rational functions.
Predict asymptotic behavior.

Graph rational functions along with their asymptotes.

12. Evaluate expressions containing exponentials

Learning Objectives

Define the general exponential function.
Define the exponential function with e .
Deduce laws of exponential growth and decay.
Model real-world problems using exponentials.

13. Evaluate expressions containing logarithms

Learning Objectives

Simplify logarithmic expressions using the properties of logarithms.
Define common and natural logarithms.
Change logarithmic expressions from one base to another.

14. Solve equations containing exponentials and logarithms

Learning Objectives

Specify behavior of such functions in terms of domain and range of the functions.
Solve certain exponential equations exactly.
Solve certain logarithmic equations exactly.
Approximate solutions to other exponential and logarithmic equations.

15. Use row operations to solve system of linear equations

Learning Objectives

Solve simple systems using shorthand matrix concepts.
Solve systems of equations using Gauss-Jordan elimination.
Solve systems of linear equations with Cramer's Rule.

16. Solve systems of linear inequalities

Learning Objectives

Generate individual terms from the definition of a sequence.
Create the most likely general term of a given finite sequence.

17. Predict the behavior of well-known sequences

Learning Objectives

Generate individual terms in an arithmetic sequence.
Deduce the general term of an arithmetic sequence.

18. Define arithmetic sequences

Learning Objectives

Generate individual terms in an arithmetic sequence.
Deduce the general term of an arithmetic sequence.

19. Define geometric sequences

Learning Objectives

Generate individual terms in a geometric sequence.
Deduce the general term of a geometric sequence.
Apply geometric sequences to growth and decay problems.

20. Sum an arithmetic series

Learning Objectives

Interpret the sigma sum notation.
Compute a sum knowing the first term, number of terms and the common difference.
Find the fourth item knowing any three terms of part (b), above.
Visualize an arithmetic series geometrically.
Interpret the method of (d), above, in the context of what the Ancient Greeks have given us.

21. Sum a geometric series

Learning Objectives

Compute a sum knowing the first term, number of terms and the common ratio.
Sum an infinite geometric series when the ratio is appropriate.

22. Compute the number of elements in a subset of a population**Learning Objectives**

Compute the number of elements where order doesn't matter, using combinations.
Simplify expressions using properties of combinations.
Count arrangements of items using permutations where order does matter.

23. Expand expressions using the Binomial Formula**Learning Objectives**

Use Pascal's Triangle to rapidly compute coefficients.
Use the definition to compute coefficient.
Find specific terms in a binomial expansion.
Expand a binomial raised to a power.

SCC Accessibility Statement

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