

Southern Connecticut State University
School of Arts and Sciences
Department of Mathematics

OUTLINE FOR MAT 100
Intermediate Algebra

I. Catalog Description.

Topics include linear, quadratic, polynomial, and basic rational and radical functions with graphing and word problems.

II. Purpose.

The purpose of MAT 100 is to provide students with the algebraic skills and concepts needed for MAT 103, 105, 107, 108, and 112.

III. Credit.

MAT 100 carries three semester hours of university credit. This course does not satisfy the University requirement in Mathematics.

IV. Prerequisites.

MAT 095 or placement.

V. Format.

MAT 100 is offered in the lecture-discussion format. Classes will meet for three contact hours per week.

VI. Technology.

Individual instructors may require a graphing calculator. However, no calculator with more than six functions (+, -, \times , /, $\sqrt{\quad}$, %) may be used on any graded in-class assessment.

VII. Course Objectives.

1. Set up and use simple mathematical models. In particular, students should be able to translate “word problems” into corresponding mathematical problems and then interpret the results in terms of the conditions of the word problems.
2. Solve linear equations and inequalities.
3. Solve compound inequalities.
4. Graph linear equations in two variables using their understanding of linear equations, slope and y -intercept of a line.
5. Recognize and complete operations on polynomial expressions including addition, subtraction, multiplication, and factoring.
6. Solve quadratic equations using a variety of methods.
7. Graph quadratic functions using translations.
8. Gain a basic understanding of radical and rational functions.
9. Understand and manipulate functions and function notation.

VIII. Outline.

Percentages are based on a 28-class semester with 5 classes reserved for testing and review.

Functions and The Cartesian Plane (2.5 weeks – 20%)

- Function Definition
- Domain and Range with Interval and Inequality Notation
- Function Notation
- Plotting Points in the Rectangular Coordinate System
- Graphing Functions by Plotting Points
- Simple Arithmetic of Functions

Linear Functions, Equations, and Inequalities (2 weeks – 16.7%)

- Linear Functions and their Graphs
- Slope of a Line
- Solving Linear Equations in One Variable
- Applications of Slope and Linear Equations
- Solving Linear Inequalities both Simple and Compound

Quadratics and Other Polynomials (3.5 weeks – 30%)

- Adding and Subtracting Polynomials
- Multiplying Polynomials
- Special Products of Binomials
- Factoring (GCF, trinomials)
- Solving Quadratic Equations by Factoring and Extraction of Roots
- The Quadratic Formula/Imaginary Numbers
- Graphs of Quadratic Functions using Translations/Vertex Form
- Applications

Rational Functions (2 weeks – 16.7%)

- Basic Concepts including Domain and Evaluation
- Multiplying and Dividing Rational Expressions
- Adding and Subtracting Rational Expressions with a Common Denominator
- Proportions and Solving Simple Rational Equations

Radical Functions (2 weeks – 16.6%)

- Basic Concepts including Domain and Evaluation
- Using Radical Notation and Evaluating Roots
- Adding and Subtracting Simple Radical Expressions
- Solving Simple Equations containing Radicals

IX. Assessment

Individual instructors may vary assessment modes, but typically grades will be based on a combination of homework assignments, quizzes, and exams.

X. Text.

The outline is based on Hall & Mercer, *Beginning and Intermediate Algebra, the Language and Symbolism of Mathematics*, 3rd Ed., McGraw-Hill, 2011.

XI. Waiver Policy.

There is no waiver for MAT 100.