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

OUTLINE FOR MAT 100P
Introductory and Intermediate Algebra

I. Catalog Description.

Topics include real numbers and variables, plus linear, quadratic, polynomial, and basic rational and radical functions with graphing, word problems, and linear systems. Two additional hours in the emporium required weekly to complement learning.

II. Purpose.

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

III. Credit.

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

IV. Prerequisites.

This course has no prerequisites.

V. Format.

MAT 100P is offered in the emporium format. Students will be required to spend five contact hours per week in the emporium, three scheduled with their instructor and two walk-in (lab) hours. MAT 100P carries a faculty teaching load of three and a half credits.

VI. Technology.

Appropriate technology will be provided in the emporium.

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. Understand and apply the properties of real numbers and integer exponents.
3. Evaluate numerical expressions involving rational numbers.
4. Solve linear equations and inequalities.
5. Solve systems of linear equations in two variables.
6. Solve compound inequalities.
7. Graph linear equations in two variables using their understanding of linear equations, slope and y-intercept of a line.
8. Recognize and complete operations on polynomial expressions including addition, subtraction, multiplication, and factoring.
9. Solve quadratic equations using a variety of methods.
10. Graph quadratic functions using translations.
11. Gain a basic understanding of radical and rational functions.
12. Understand and manipulate functions and function notation.

VIII. Outline.

Real Numbers and Variables (2 weeks – 16%)

- The Real Number Line
- Adding, Subtracting, Multiplying and Dividing Integers and Rational Numbers
- Absolute Values and Square Roots
- Natural Number Exponents and Order of Operations
- Using Variables and Formulas
- Rules of Exponents
- Scientific Notation

Functions and The Cartesian Plane (2 weeks – 16%)

- 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 and Equations (2 weeks – 16%)

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

Linear Systems and Inequalities (1.5 weeks – 12%)

- Solving Linear Systems Graphically
- Solving Linear Systems by the Substitution and Addition Methods
- Applications of Linear Systems
- Solving Linear Inequalities both Simple and Compound

Quadratics and Other Polynomials (3 weeks – 24%)

- 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 (1 week – 8%)

- 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 (1 week – 8%)

- 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

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 100P.