## Intermediate Algebra: University of Alabama

(For a list of materials used in the course, please see
http://www.theNCAT.org/R2R/AcadPrac/CM/UA_IntAlg_Mat.pdf.)

Intermediate Algebra is a one-semester, three-credit course that covers the following topics:

Real Numbers and Algebraic Expression
    Algebraic Expressions and Sets of Numbers
    Properties of Real Numbers
    Operations on Real Numbers
    Order of Operations and Algebraic Expressions
    Group Activity:  Analyzing Newspaper Circulation

Equations, Inequalities, and Problem Solving
    Linear Equations in One Variable
    An Introduction to Problem Solving
    Formulas and Problem Solving
    Linear Inequalities and Problem Solving
    Compound Inequalities
    Absolute Value Equations
    Absolute Value Inequalities
    Group Activity:  Investigating Compound Interest

Graphs and Functions
    Graphing Equations
    Introduction to Functions
    Graphing Linear Functions
    The Slope of a Line
    Equations of Lines
    Graphing Linear Inequalities
    Group Activity:  Modeling Japanese Automobile Imports

Systems of Equations
    Solving Systems of Linear Equations in Two Variables
    Solving Systems of Linear Equations in Three Variables
    Systems of Linear Equations and Problem Solving
    Solving Systems of Equations by Matrices
    Solving Systems of Equations by Determinants
    Group Activity:  Locating Lightning Strikes

Exponents, Polynomials, and Polynomial Functions
    Exponents and Scientific Notation
    More Work with Exponents and Scientific Notation
    Polynomials and Polynomial functions
    Multiplying Polynomials
    The Greatest Common Factor and factoring by Grouping
    Factoring Trinomials
    Factoring by Special Products and Factoring Strategies
    Solving Equations by Factoring and Problem Solving
    An Introduction to Graphing Polynomial Functions
    Group Activity:  Finding the Largest Area

Rational Expressions
    Rational functions and Simplifying Rational Expressions
    Multiplying and Dividing Rational Expressions
    Adding and Subtracting Rational Expressions
    Simplifying Complex Fractions
    Dividing Polynomials
    Synthetic Division and the Remainder Theorem
    Solving Equations containing Rational Expressions
    Rational Equations and Problem Solving
    Variation and Problem Solving
    Group Activity: Modeling Electricity Production

Rational Exponents, Radicals, and Complex Numbers
    Radicals and Radical Functions
    Rational Exponents
    Simplifying Radical Expressions
    Adding, Subtracting, and Multiplying Radical Expressions
    Rationalizing Numerators and Denominators of Radical Expressions
    Radical Equations and Problem Solving
    Complex Numbers
    Group Activity: Calculating the Length and Period of a Pendulum

Quadratic Equations and Functions
    Solving Quadratic Equations by Completing the Square
    Solving Quadratic Equations by the Quadratic Formula
    Solving Equations by Using Quadratic Methods
    Nonlinear Inequalities in One Variable
    Quadratic Functions and Their Graphs
    Further Graphing of Quadratic Functions
    Group Activity: Modeling the Position of a Freely Falling Object

Conic Sections
    The parabola and the Circle
    The Ellipse and the Hyperbola
    Solving Nonlinear Systems of Equations
    Nonlinear Inequalities and Systems of Inequalities
    Group Activity: Modeling Conic Sections