

# SUFFOLK COUNTY COMMUNITY COLLEGE COLLEGE-WIDE COURSE SYLLABUS

## MAT007 (formerly MA07)

### I. COURSE TITLE:

Algebra I

### II. CATALOG DESCRIPTION:

Introduction to basic concepts of algebra. Equivalent to first-year high school algebra. Topics include language of algebra, order of operations, signed numbers, linear equations, simultaneous equations, factoring, solving quadratic equations by factoring, application of algebra to selected verbal problems. Does not fulfill requirements for any degree of certificate. Graded on an SA-SB-SC-R-U-W basis.

A-E-G / 4 cr. hrs.

### III. COURSE GOALS:

- A. Reinforce basic algebra skills.
- B. Introduce elementary problem-solving techniques.
- C. Introduce the concept of a line and the technique of graphing in two dimensions.

### IV. COURSE OBJECTIVES:

Upon successful completion of this course, students will be able to:

- A. Demonstrate an understanding of the use of variables as representatives of real numbers, the use of the order of operations to evaluate algebraic expressions, and the meaning of terms, expressions, and factors;
- B. Demonstrate an understanding of the arithmetic properties of real numbers (associative, commutative, identities, inverses, and distributive properties) and be able to apply these properties in manipulating algebraic equations;
- C. Solve linear equations and inequalities in one variable and apply these techniques to simple models;
- D. Solve systems of linear equations in two variables using the techniques of graphing lines, algebraic substitution method, and the algebraic elimination method, and apply these techniques to simple models; moreover, the methods of graphing a line should be done using table of values, intercepts, and incorporating the slope of the line;
- E. Perform polynomial addition, subtraction, multiplication, division by a monomial, and factoring; polynomial equations that can be factored, should be solved and these techniques applied to simple models;
- F. Simplify and perform basic operations on rational expressions; moreover, be able to solve rational equations using factoring techniques and apply these techniques to simple models;
- G. Demonstrate an understanding of radicals and simplify expressions involving radicals.

### V. Topics Outline

Topics	Approximate Time (Including Examinations)
A. Review of the Fundamental Operations of Real Numbers <ul style="list-style-type: none"> <li>1. Mathematical symbols and notation</li> <li>2. Sets of numbers</li> <li>3. Basic properties (axioms) of real numbers</li> <li>4. Operations of signed numbers</li> <li>5. Graphing of signed numbers</li> <li>6. Order of operations</li> <li>7. Absolute Value</li> </ul>	1 ½ weeks
B. Linear Equations and Inequalities <ul style="list-style-type: none"> <li>1. Solving linear equations</li> <li>2. Solving verbal problems and applications</li> <li>3. Solving simple linear inequalities</li> <li>4. Basic formula manipulations</li> </ul>	2 ½ weeks

C. Graphing and Systems of Linear Equations <ol style="list-style-type: none"> <li>1. The Cartesian coordinate system</li> <li>2. Graphs of linear equations</li> <li>3. Definition of slope, parallel and perpendicular lines</li> <li>4. Using slope-intercept form of a linear equation to graph lines</li> <li>5. Solving linear systems by graphing, addition, and substitution methods</li> <li>6. Applications involving linear systems</li> </ol>	3 weeks
D. Operations with Polynomials <ol style="list-style-type: none"> <li>1. Naming and evaluation of polynomials</li> <li>2. Addition and subtraction of polynomials</li> <li>3. Properties of exponents and scientific notation</li> <li>4. Multiplication of polynomials</li> <li>5. Division of polynomials by monomials</li> <li>6. OPTIONAL: Division of polynomials by a binomial</li> </ol>	2 weeks
E. Factoring Polynomials and Solving Quadratic Equations by Factoring <ol style="list-style-type: none"> <li>1. Common factors</li> <li>2. Difference of two squares</li> <li>3. Factor trinomials</li> <li>4. Solving quadratic equations by factoring</li> </ol>	2 ½ weeks
F. Algebraic Fractions <ol style="list-style-type: none"> <li>1. Simplifying algebraic fractions</li> <li>2. Multiplication and Division</li> <li>3. Addition and subtraction</li> <li>4. Solving equations containing algebraic fractions</li> <li>5. Solve applied problems (which translate into proportions)</li> </ol>	2 ½ weeks
G. Common Roots and Radicals <ol style="list-style-type: none"> <li>1. Definition</li> <li>2. Properties</li> <li>3. Simplification of a single radical</li> </ol>	1 week

**VI. Evaluation of Student Performance:**

To be determined by the instructor

**VII. Programs that require this course:**

None

**VIII. Courses that require this course as a prerequisite:**

BIO101, BIO103, BIO105, BIO109, BIO111, BIO130-132, BIO137, BIO141, CHE100, CHE120, CHE122, CST112, ESC101, ESC102, MET101, MET102, AST101, EAST102, ESC124, ESC202, MAT107, MAT108, MAT101, MAT102, MAT103, MAT111, MAT115H, MAT112, AR111, MAR115, MAR102, OPD101, PHY110, SCI127H

**IX. Supporting Information:**

Mathematics tutoring services, as well as video and computer aids, are provided for all students through the Math Learning Center (Ammerman Campus, Riverhead 235), the Center for Academic Excellence (Grant Campus, Health, Sports and Education Center 129), and the Academic Skills Center (Eastern Campus, Orient 213).