SUFFOLK COUNTY COMMUNITY COLLEGE
COLLEGE-WIDE COURSE SYLLABUS
MAT111 (formerly MA27)

I. COURSE TITLE:
Algebra II

II. CATALOG DESCRIPTION:
Continuation of study of basic concepts of algebra. Topics include brief review of elementary algebra, solutions of second-degree equations, radicals, complex numbers, rational expressions, polynomial expressions, rational exponents and roots, systems of equations and inequalities. Prerequisite: MAT007 or equivalent
A-E-G / 4 cr. hrs.

III. COURSE GOALS:
A. Extend the conceptual framework of an elementary algebra course.
B. Prepare students for a wide range of higher level mathematics courses.
C. This course satisfies the SUNY general education requirement for mathematics.

IV. COURSE OBJECTIVES:
Upon successful completion of this course, students will be able to:
A. solve the following types of equations: linear equations, quadratic equations, absolute-value equations, equations involving rational expressions, equations involving radicals, systems of two equations in two unknowns, systems of three equations in three unknowns;
B. solve the following types of inequalities: linear inequalities, absolute-value inequalities, systems of linear inequalities in two variables;
C. graph the following: lines, parabolas, linear inequalities in two variables;
D. perform the elementary operations on the following: polynomials, rational expressions, complex numbers, radicals;
E. simplify algebraic expressions including: reducing to lowest terms; complex fractions; algebraically rewriting results using basic definitions, laws of exponents, distributive law, factoring, and other basic properties of real numbers; rationalizing the denominator;
F. set up and solve word problems which apply linear equations, quadratic equations, equations involving rational expressions;
G. interpret the basic relationships linking linear equations and linear inequalities in two variables, and parabolic equations to their graphs such as: solution sets, slope, parallel and perpendicular lines, forms of equations of lines, x-intercepts, y-intercepts, intersection of lines.

V. Topics Outline with Timeline

Topics	Approximate Time (Including Examinations)
A. Elementary Algebra Review: 1. arithmetical operations on integers and rationals 2. terminology: associative, commutative and distributive properties; subsets of reals (Note: appropriate review topics can be covered as each core topic is introduced.)	1 week
B. Review Linear Equations in One Variable 1. addition and multiplication principles introduced and used in solution process with integral coefficients/constants and parentheses. 2. solution process with rational and decimal coefficients/constants and parentheses. 3. formula evaluation and rearrangement (literal coefficients/constants) 4. word problems (age, coin, geometric, consecutive integers).	1 week
C. Linear Inequalities in One Variable 1. review number line graphing of solution 2. compound inequality statements	1 week
D. Absolute Value (linear domains) 1. $c\left\|ax+b\right\|+d=e$ 2. $c\left\|ax+b\right\|+d<e$ and $c\left\|ax+b\right\|+d>e$ 3. number line graphing of solution	½ week
E. Review Graphs of Lines in Two Variables	1 week
F. Lines and Systems of Equations 1. point-slope form 2. slope-intercept form 3. slope of parallel and perpendicular lines 4. formula for the distance between two points 5. elimination and substitution techniques for 2x2 and 3x3 systems 6. graphical interpretation of 2x2 and 3x3 systems, including inconsistent and dependent systems 7. appropriate word problems (as in item B4 above, as well as motion and interest) 8. sketching linear inequalities in two variables	2 ½ weeks
G. Polynomials 1. properties of integral exponents 2. four basic operations (including long division) 3. factoring common factors 4. factoring by grouping (including multi-termed factor)	2 weeks

5. factoring $ax^2 + bx + c$ 6. special products and factoring (perfect square trinomials, difference of two squares, sum/difference of two cubes)	
H. Rational Expressions 1. lowest term reduction 2. four basic operations on rational expressions 3. equations involving rational expressions 4. complex fractions 5. variation 6. appropriate word problems (motion, work, etc.)	2 weeks
I. Rational Exponents and Roots 1. exponential properties applied to rational exponents 2. simplified radical form 3. four basic operations on radical expressions 4. equations with radicals 5. four basic operations on complex numbers	2 weeks
J. Quadratic Equations 1. solution by factoring 2. completing the square 3. quadratic formula usage and discriminant 4. quadratic form equations 5. graphing parabolas 6. word problems	2 weeks

VI. Evaluation of Student Performance:
To be determined by the instructor

VII. Programs that require this course:
Automotive Service Specialist/AAS (required)
Dietetic Technician/AAS (recommended)
Engineering and Technology: Computer-assisted Drafting/Certificate (required)
Information Technology/AAS (required prior to enrollment)
Ophthalmic Dispension/AAS (required)

VIII. Courses that require this course as a prerequisite:
AUT120, CHE122 (corequisite), COT110, COT114, MAT121, MAT124, ELT112 (corequisite), TELT113 (corequisite), ELT115 (corequisite), ELT222, ELT224, PHY115, PHY120

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).