

SUFFOLK COUNTY COMMUNITY COLLEGE
COLLEGE-WIDE COURSE SYLLABUS
MAT112 (formerly MA41)

I. COURSE TITLE:

Technical Mathematics I

II. CATALOG DESCRIPTION:

Restricted to students in certain technical curricula. Includes review of elementary algebra, scientific notation, use of calculator, linear functions, trigonometric functions, system of linear equations, solution of oblique triangles and vector addition, properties of exponents and radicals.

Prerequisite: MAT007 or equivalent.

A-G / 4 cr. hrs.

III. COURSE GOALS:

- A. To provide an integrated treatment of mathematical topics essential for a sound technical mathematics background.
- B. To increase analytical and computational skills.
- C. To develop a systematic approach to problem solving.

IV. COURSE OBJECTIVES:

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

- A. perform basic arithmetic operations on real numbers using examples from the field of technology, using a scientific calculator;
- B. perform basic operations on algebraic expressions with and without fractions and evaluate formulas from all fields of technology;
- C. find the value of a function;
- D. solve first-degree equations with one unknown;
- E. graph a linear function, $y = mx + b$, on the rectangular coordinate system using ordered pairs, and the slope of the line;
- F. sketch quadratic functions and solve quadratic equations, utilizing factoring, completing the square and the quadratic formula, with real and complex roots;
- G. sketch and solve linear and quadratic inequalities;
- H. apply techniques of direct and indirect variation;
- I. find the trigonometric functions of an angle in degree or radian notation, using a scientific calculator; and solve practical problems relating to angles of elevation and depression involving right triangles;
- J. solve linear system of equations (in two unknowns) graphically, and check the solution using algebraic techniques;
- K. find the perimeter, area, and volume of basic geometric shapes and use in applications.

V. Topics Outline with Timeline

Topics	Approximate Time (Including Examinations)
A. <u>Fundamental Concepts and Operations of Algebra</u> <ol style="list-style-type: none"> 1. real number systems, order of operation 2. rules of exponents, scientific notation, and significant digits 3. metric system and dimensional analysis 4. linear equations, formula manipulation, and applications 5. ratio and proportion 	2 weeks
B. <u>Functions and Graphs</u> <ol style="list-style-type: none"> 1. functions and graphing functions 2. rectangular coordinate system 3. straight line, slope, distance formula 4. parallel and perpendicular lines 	1 ½ weeks
C. <u>Geometry</u> <ol style="list-style-type: none"> 1. angles and lines 2. triangles, quadrilaterals, and circles 3. geometric solids: areas and volumes 	1 weeks
D. <u>Trigonometric Functions</u> <ol style="list-style-type: none"> 1. trigonometric ratios 2. inverse trigonometric functions 3. solving right triangles and applications 	2 weeks
E. <u>Factoring and Algebraic Fractions</u> <ol style="list-style-type: none"> 1. factoring algebraic functions 2. different forms of factoring 3. multiplication and division of algebraic fractions 4. complex fractions and solving equations with fractions 	2 weeks
F. <u>Systems of Linear Equations</u> <ol style="list-style-type: none"> 1. solving systems of linear equations in two variables graphically, algebraically, and using determinants 2. solving systems of equations in three or more variables 3. applications 	1 ½ weeks
G. <u>Quadratic Equations</u> <ol style="list-style-type: none"> 1. solving quadratic equations by factoring 2. solving quadratic equations by graphing 3. solving quadratic equations by completing the square (optional) 4. solving quadratic equations by the quadratic formula 5. applications 	1 ½ weeks
H. <u>Inequalities</u> <ol style="list-style-type: none"> 1. solving inequalities 2. equations and inequalities involving absolute value 3. other types of inequalities 	1 ½ weeks
The remaining time to be used for review and evaluation as needed	2 weeks

VI. Evaluation of Student Performance:

To be determined by the instructor

VII. Programs that require this course:

Telecommunications Technology/AAS

Heating, Ventilation, Air Conditioning, and Refrigeration/AAS and Certificate Program

VIII. Courses that require this course as a prerequisite:

MAT113, PHY112, TEL112 (corequisite), TEL220, TEL222; TEL224

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).