SUFFOLK COUNTY COMMUNITY COLLEGE
COLLEGE-WIDE COURSE SYLLABUS
MAT113 (formerly MA42)

I.   COURSE TITLE:
Technical Mathematics II

II.   CATALOG DESCRIPTION:
Restricted to students in certain technical curricula. Covers use of calculator, complex numbers, theory and use of logarithms, basic theory of equations, trigonometric identities, inequalities and basic analytical geometry. Prerequisite:C or better in MAT112   A / 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 calculations with complex numbers in polar, rectangular and exponential forms including arithmetic and exponential operations;
   B.   solve trigonometric equations utilizing techniques of sketching, identities and inverse functions;
   C.   sketch graphs and solve equations involving exponential and logarithm functions;
   D.   perform algebraic operations on expressions involving radicals and exponents, from diverse fields of technology;
   E.   resolve vectors of force, velocity, and impedance, into vector-components, and conversely combine two or three vectors into a resultant vector, and solve oblique triangles (laws of sines and cosines);
   F.   find amplitude, frequency (period), and phase-angle (displacement) of sine and cosine waves, and sketch these periodic curves;
   G.   summarize and interpret data, understand measures of central tendency and measures of dispersion;
   H.   find lines of best fit given data and process control and quality assurance;
   I.   have an intuitive feel for the concepts of limits, derivative, and integral.

V.   Topics Outline with Timeline

Topics	Approximate Time (Including Examinations)

A.   Graphs of Trigonometric Functions
     1.   review graph of $y = a \sin(bx + c)$
     2.   review graph of $y = a \cos(bx + c)$
	1 weeks

B. Inequalities 1. properties of Inequalities	½ week

Revised: Fall 2008

2. solving linear inequalities	

C. <u>Exponents and Radicals</u>
    1.   integral exponents
    2.   simplification of radials and basic operations of radicals
    3.   radical equations
    4.   base 2 and 16
	1 ½ weeks

D. <u>Exponential and Logarithmic Functions</u>
    1.   exponential functions, growth and decay
    2.   logarithmic functions, common logs and natural logs
    3.   properties of logarithms
    4.   exponential equations and logarithmic equations
    5.   graphing on log and semi-log paper
	2 ½ weeks

E. <u>Ratio, Proportion and Variation</u>
    1.   ratio and proportion
    2.   direct variation, inverse variation, and joint and combined variation
	1 week

F. <u>Oblique Triangles</u>
    1.   trigonometric function of any angle
    2.   oblique triangles, law of sines
    3.   law of cosines
	1 week

G. <u>Complex Numbers</u>
    1.   review of basic definitions and rectangular and polar form of complex numbers
    2.   exponential form of a complex number
    3.   AC applications
	1 week

H. <u>Intuitive Approach to Calculus</u>
    1.   limits, average value of a function, average rate of change
    2.   instantaneous rate of change
    3.   area under a curve
    4.   root mean square of a function
	2 weeks

I. <u>Statistics</u>
    1.   definitions and terminology
    2.   frequency distributions and numerical description of data
    3.   the normal curve
    4.   standard error
    5.   process control and control charts
    6.   fitting a straight line to data points
    7.   probability
	3 weeks

The remaining time to be used for review and evaluation as needed	1 ½ weeks

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

VII.   Programs that require this course:
Telecommunications Technology/AAS

VIII.   Courses that require this course as a prerequisite:
TEL222 (corequisite), TEL224 (corequisite), TEL230, TEL232, TEL234, TEL240, TEL242

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).