

**SUFFOLK COUNTY COMMUNITY COLLEGE
COLLEGE-WIDE COURSE SYLLABUS
MAT120**

I. COURSE TITLE:
College Algebra and Trigonometry

II. CATALOG DESCRIPTION:
A comprehensive analysis of fundamental algebraic concepts. Topics include factoring, equations and inequalities, polynomials, complex numbers, rational expressions, absolute value, and trigonometry. Careful development of functions and their properties, operations, and graphs. Study of various standard functions, along with one-to-one, inverse, exponential, logarithmic, and trigonometric functions. Techniques for solving equations, inequalities and systems of equations. Exploration of related applications and models. Prerequisite: C or better in MAT111 or placement.

A-E-G / 4 credit hours

III. COURSE GOALS:
A. Prepare students for a wide range of science and mathematics courses.
B. 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. Use factoring, completing the square, or the quadratic formula to solve polynomial equations;
B. Use operations with complex numbers and logarithms;
C. Solve equations that involve absolute value, rational expressions, radical expressions, a system of equations in two or three variables, exponential expressions, and logarithms;
D. Solve inequalities that involve absolute value;
E. Define and describe the concept of a function;
F. Use graphing techniques to illustrate the solution set for a system of inequalities;
G. Apply algebraic techniques to solve real-world problems.
H. Graph trigonometric functions and solve applications using right triangle relationships.

V. TOPICS OUTLINE:

Topics	Approximate Time (including examinations)
A. Equations and Inequalities 1. Solving polynomial equations a. Complex Numbers i. Definition ii. Sum, difference, and product iii. Rationalize denominators	3 weeks

<ul style="list-style-type: none"> b. By factoring c. By square root property d. By completing the square e. By the quadratic formula f. Use the discriminant to identify the number and type of solutions g. Identify real and non-real solutions 2. Solve equations with rational expressions 3. Solve equations with radical expressions 4. Applications (variation, work, motion) 5. Absolute value <ul style="list-style-type: none"> a. Definition of absolute value b. Solve equations with absolute value in one variable c. Solve compound inequalities involving <i>or</i> and <i>and</i> <ul style="list-style-type: none"> i. Graph the solution set on a number line ii. Write the solution set in interval and set-builder notation d. Solve inequalities with absolute value in one variable 	
<p>B. Concept of a Function</p> <ul style="list-style-type: none"> 1. Introduction to a function and function notation 2. Definition of the graph of a function and the vertical line test 3. Domain and range 4. Standard functions and their graphs: constant, identity, linear, square, cubic, square root, cube root, reciprocal, absolute value, piece-wise defined 5. Function operations and composition 6. One-to-one functions and the horizontal line test 7. Inverse functions 	2 weeks
<p>C. Exponential and Logarithmic Functions</p> <ul style="list-style-type: none"> 1. Define exponential and logarithmic functions and identify restrictions on the variable 2. Convert between an exponential and a logarithmic statement 3. Two special identities (Theorem of Inverses) 4. Define Euler number e and the natural logarithm 5. Solve logarithmic and exponential equations 6. Product, quotient, and power rules of a logarithm 7. Evaluate logarithmic expressions and Change of Base Theorem 8. Use logarithms to solve equations with exponential expressions 9. Solve logarithmic equations 10. Applications (compound interest, growth, and decay) 	3.5 weeks
<p>D. Systems of Linear Equations and Inequalities</p> <ul style="list-style-type: none"> 1. Find and graph the solution set for an inequality in two variables 2. Find and graph the solution set for a system of inequalities 3. System of linear equations in two and three variables <ul style="list-style-type: none"> a. Use the elimination technique to find the solution b. Use the substitution technique to find the solution c. Independent and dependent equations 	2.5 weeks

d. Consistent and Inconsistent system e. Applications	
E. Introduction to Trigonometry 1. Angles a. Degree and radian measure b. Standard reference angles 2. Unit circle trigonometry a. Define the six trigonometric functions b. Pythagorean Theorem - distance formula c. Applications 3. Graphs of trigonometric functions a. Domain and range b. Amplitude, period, and frequency	3 weeks
F. Review and Cumulative Final Examination	1 week

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

VII. Resources:

College Algebra and Trigonometry, 7th edition, Lial, Hornsby, Schneider, & Daniels
Pearson, 2021

VIII. Programs that require this course:

A.A.S. Construction Tech, A.A. Cinema Studies, A.A. Creative Writing, A.A. English, A.A. Foreign Language, A.A. Philosophy

IX. Courses that require this course as a prerequisite:

CHE133, CHE134, COT233, CSE148, ELT231, MAT131, PHY101

X. Courses that require this course as a corequisite:

COT166, CSE118, ELT222, ELT224

XI. Tutoring and Supportive Resources at [SCCC](#)