

BROOME COMMUNITY COLLEGE
Binghamton, New York

COURSE TITLE COLLEGE ALGEBRA AND TRIGONOMETRY I MAT 136

CLASS LECTURE HOURS 4 LAB HOURS 0 CREDIT HOURS 4

DIVISION DEAN Julia Peacock

DEPT. CHAIRPERSON Paul O'Heron DATE Fall 2003rev Spring 2005

Prerequisite: MAT 096 Elementary Algebra and Trigonometry or equivalent.

MAT 136 Objectives

After taking MAT 136 the student should be able to:

Perform skills in three categories: Algebra, Geometry, Trigonometry; Non Calculator Graphing; and Graphing Calculator.

Note: Throughout the course the students are expected to solve applied problems related to the topics of the course.

Algebra, Geometry, Trigonometry:

1. Perform arithmetic operations and simplification of rational expressions including complex fractions.
2. Solve absolute value linear equations and inequalities using analytic methods.
3. Perform operations and simplify expressions involving radicals and rational exponents.
4. Perform operations and simplify expressions involving complex numbers.
5. Rationalize denominators and numerators.
6. Understand the definition of a function of x and find the domain and range of a function.
7. Use function notation.
8. Review linear functions and their applications.
9. Perform operations on functions including composition.
10. Find an inverse function algebraically.
11. Use properties of exponential and logarithmic functions.
12. Use the change of base formula.
13. Use interval notation.
14. Solve compound inequalities.
15. Perform polynomial long division.
16. Solve quadratic equations and inequalities and applications thereof.
17. Apply the Remainder Theorem and Factor Theorem to higher degree polynomials.
18. State the Fundamental Theorem of Algebra and find all complex zeros of a polynomial function.
19. Construct an expression for a polynomial given its roots.
20. Use radians to measure angles.
21. Find reference angles for angles measured in degrees and radians.
22. Find the trigonometric functions for a general angle.
23. Use reciprocal, Pythagorean, cofunction, quotient and odd/even identities.
24. Use the distance and midpoint formulas.
25. Find the arc length and area for a sector of a circle.
26. Review trigonometric functions of acute angles and applications of right triangles.

Non Calculator Graphing:

27. Identify and graph the following families of relations:

a. $ax + by = c$

b. $y = ax^2 + bx + c$

c. $y = x^n$

d. $y = |x|$

e.

$y = 1/x$

f. $y = a^x$

g. $y = a \sin bx$

h. $y = a \cos bx$

i. $y = a \tan bx$

28. Graph functions and relations by using various graphing techniques: symmetry, reflection, translation and contraction.

29. Sketch a comprehensive graph of a polynomial function including end behavior, extrema and real zeros.

30. Relate the graphs of $y = \sin x$ and $y = \cos x$ to the unit circle.

31. Graph inverse functions.

32. Graph piece-wise functions.

Graphing Calculator:

33. Graph piece-wise functions.

34. Plot points and fit a line to the data using calculator regression.

35. Solve functional and relational inequalities by graphing.

36. Find roots of polynomials using the zero command.

37. Solve equations using the zero and the intersection methods.

38. Solve an equation using the computer algebra system.

39. Use the Exact and Approximate output mode.

40. Setup and read tables.

41. Find minima and maxima using the Math options for the graph.

42. Get an appropriate window and accurately sketch the graph of a relation or function.

43. Establish a trigonometric identity by using graphing and using the computer algebra system.

44. Use the trigonometric and inverse trigonometric commands.

45. Use the exponential and logarithmic commands.

CATALOG COURSE DESCRIPTION

Rational exponents; radicals; polynomial long division; rational expressions; solving quadratic equations and inequalities; polynomial functions; absolute value equations and inequalities; complex numbers; operations on functions; inverse functions; properties of exponential and logarithmic functions; trigonometric functions; reference angles; radian measure; graphs of sine, cosine and tangent; basic trigonometric identities.

4 class hours; Prerequisite: MAT 096 Elementary Algebra and Trigonometry or equivalent.