MATH 135
Applied Algebra and Trigonometry
3 Credits

Community College of Baltimore County
Common Course Outline

Description

MATH 135 – Applied Algebra and Trigonometry: is a course that covers a wide range of real world applications of college-level algebraic and trigonometric topics, such as linear and quadratic equations, right-triangle trigonometry and vectors, and exponents and logarithms; students develop problem-solving skills relevant to their disciplines. This course is primarily for students in certain technically-oriented disciplines.

Pre-requisites: ACLT 053 or (ESOL 052 and ESOL 054) and MATH 083 or a sufficient score on the placement exam

Overall Course Objectives

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

1. articulate solutions to mathematical problems;
2. define various algebraic functions;
3. interpret concepts of algebra and trigonometry using appropriate terminology;
4. solve linear and quadratic equations in applied settings;
5. solve problems involving trigonometry, vectors, exponents, and logarithms;
6. describe mathematical information in table, graphical, formulaic, and written formats;
7. demonstrate a working knowledge of mathematical applications relevant to such fields of study as Drafting and Allied Health and to such programs as Radiation Therapy, Ultrasound, CADD, Automotive Technology, and Medical Laboratory Technology;
8. justify the accurate and ethical selection of appropriate mathematical functions that describe specific data;
9. select the appropriate mathematical theories, dependent upon the nature of the specific data, to make informed conclusions;
10. use appropriate technology for the solution of mathematical problems;
11. evaluate efficient and inefficient methods for problem solving;
12. find, evaluate, use, and cite appropriate academic sources to research mathematical and related topics;
13. construct solutions to real world problems using problem solving methods; and
14. apply algebraic and/or trigonometric concepts to a global or international context.

Major Topics

I. Review of:
   a. Scientific notation
   b. Ratios and proportions
   c. Formula evaluation

d. Rewriting application formulas in terms of any variable
e. Evaluating application formulas for a given variable
f. Laws of exponents
g. Linear equations using slope and intercepts
II. Basic algebraic operations
a. Significant digits
b. Converting measurements from one unit to another
c. Solving word problems using direct and inverse variation
III. Functions and graphs
a. Linear functions
b. Quadratic functions
c. Tables of data
d. Representations of a function (tables, graphs, formula)
IV. Solving equations
a. 2x2 systems of linear equations
b. 3x3 systems of linear equations via Cramer's rule OR determinant/technology
V. Trigonometric functions
a. Six trigonometric functions of any angle given in degrees or radians
b. Solving right triangles applications and word problems
c. Linear velocity, arc length, and sector area application word problems
d. Law of sines and cosines applications and word problems
e. Vectors (algebraic and geometric) applications and word problems
VI. Exponential and logarithmic functions
a. Exponential functions and word problems (e.g., growth and decay)
b. Logarithmic functions (common and normal)
c. Properties of logarithms and solving word problems
d. Global and social topics evaluated through exponential functions

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- a project that may include individual work, group work, and/or oral presentation of homework solutions, which addresses the General Education Program Outcomes
- two written exams
- a final comprehensive exam

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

Other Course Information

This course is an approved 3–credit General Education course in Mathematics.
One or more assignments will infuse CCBC General Education Program outcomes and will account for a minimum of 10% of the total course grade. The assignment(s) will allow students to demonstrate at least 5 of the 7 General Education program outcomes.