

Common Course Outline

MATH 108

Technical Mathematics

3 Semester Hours

The Community College of Baltimore County

Description

Technical Mathematics

Studies the mathematical ideas and concepts related to electronics technology; covers formulas, algebraic expression, linear equations, quadratic equations, graphing, systems of linear equations, right triangle trigonometry, sinusoidal equations and graphs, laws of sine and cosine, complex numbers, polar notation, vectors, computer math and logic gates.

Prerequisites: MATH 082 or sufficient math placement score, or consent of the instructor.

Overall Course Objectives

Upon successfully completing the course students will be able to:

1. apply algebraic techniques to the solution of various electricity/electronics problems;
2. apply the basic laws associated with D.C. circuits;
3. apply appropriate graphing techniques to the solution of various electricity/electronics problems;
4. use trigonometry to solve problems associated with A.C. circuits;
5. convert between the binary, octal and hexadecimal number systems;
6. perform arithmetic computations using the binary number system;
7. apply Boolean Algebra concepts to various electricity/electronics problems;
8. perform arithmetic computations with complex numbers;
9. convert between notational forms (e.g. polar and rectangular; basic measurement units; scientific, engineering and floating decimal point; degree, radian and gradient units of circular measure).

Major Topics

- I. Basic Mathematics
 - A. formulas
 - B. literal expressions
 - C. significant figures and relative error
 - D. scientific, floating decimal and engineering notation
 - E. conversions of electronic units
 - F. Ohm's Law, Kirchoff's Law, and the Power formulas
- II. Algebraic Expressions and Equations
 - A. Linear Equations and Inequalities in One Variable
 - B. Solve Linear Equations
 - C. Applied Problems
- III. Linear Equations in Two Variables
 - A. Rectangular Coordinate System
 - B. Slope of a Line

- C. Graph Linear Equations
- D. Loop and node analysis
- E. Quadratic equations

IV. Basic Trigonometry

- A. Definition of trigonometric rates
- B. Degrees, radians, gradients, conversions
- C. Inverse trigonometric functions
- D. Laws of sine and cosine
- E. Applications

V. Complex Numbers

- A. J-operator
- B. Complex number, vector arithmetic
- C. Rectangular and polar coordinates with conversions

VI. Applications of Trigonometry to A.C. Circuits

- A. The sine wave and its various values, wavelength frequency-period relationships
- B. Phase angles, phasor arithmetic, time-phasor domain conversions
- C. Resonant frequencies

VII. Computer Mathematics

- A. Binary, octal and hexadecimal systems
- F. One's and two's complements
- G. Conversions between binary, octal, decimal and hexadecimal systems
- H. Logic gates, truth tables, Boolean Expressions and DeMorgan's Theorems

Course Requirements

Grading: Grading procedures will be determined by the individual faculty member but will include the following:

1. Four (4) written examinations
2. Comprehensive final examination
3. Individual and group work

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.

The Community College of Baltimore County is committed to providing a high-quality learning experience that results in growth in knowledge, attitudes, and skills necessary to function successfully as a transfer student, in a career and as a citizen. To accomplish this goal, we maintain high academic standards and expect students to accept responsibility for their individual growth by attending classes, completing all homework and other assignments, participating in class activities and preparing for tests.

We take seriously our responsibility to maintain high-quality programs and will periodically ask you to participate in assessment activities to determine whether our students are attaining the knowledge, attitudes and skills appropriate to various courses and programs. The assessment activities may take many different forms such as surveys, standardized or faculty-developed tests, discussion groups or portfolio evaluations. We ask that you take these activities seriously so that we can obtain valid data to use for the continuous improvement of CCBC's courses and programs.