Common Course Outline
MATH 125
Finite Mathematics and Modeling
3 Credits

Community College of Baltimore County

Description

MATH 125 –Finite Mathematics and Modeling explores applications of mathematics to business, management, science, health, and social sciences. The course covers linear functions, linear systems, matrices, probability, linear programming, mathematical models, simple and compound interest, annuities, amortization, descriptive statistics, and other selected topics.

3 Credits

Prerequisites: MATH 082 or sufficient math placement score; and ACLT 052 or ACLT 053 or (ESOL 052 and ESOL 054)

Overall Course Objectives

Upon completion of this course students will be able to:
1. calculate the slope of a line; derive and graph the equation of a line;
2. construct linear mathematical models to evaluate real world problems, ethical considerations, and interpret the meaning of the slope and intercepts;
3. perform operations on matrices, including multiplication and inversion;
4. construct a system of equations from a verbal description;
5. solve systems of equations using matrices;
6. graph the solution set for two or more linear inequalities in two variables;
7. construct the constraints and objective function for a linear programming problem from everyday life, optimize using the graphical and simplex methods, and interpret the solution;
8. construct mathematical models for real world financial mathematics, including compound interest, annuities, and amortization, and use this information to make informed decisions;
9. apply technology to the solution of mathematical problems;
10. determine the number of possible outcomes for a given application using the fundamental counting principle, permutations, and combinations;
11. apply the definitions of dependent and independent events, mutually exclusive events, sample space, and probability to solve problems involving chance;
12. calculate expected values and probabilities using the addition rule, product rule, and complement rule;

13. describe, numerically and graphically, various forms and presentations of statistical data;
14. analyze bivariate data using linear regression;
15. examine the mathematical contributions made by people from diverse cultures throughout history, and their social, and cultural significance;
16. evaluate cultural and social applications and approaches to statistical analysis; and
17. find, evaluate, use, and cite academic resources for conducting research in mathematics.

Major Topics

I. Linear Equations
  A. Slope and interpretation of slope
  B. Forms of linear equations
  C. Modeling with linear equations
II. Matrices
  A. Terminology and basic operations
  B. Inverse matrices
  C. Gauss-Jordan method
  D. Gaussian elimination method
III. Linear Programming
  A. Graphs of systems of linear inequalities
  B. Corner point theorem
  C. Solving linear programming problems using the graphical method
  D. Solving linear programming problems using the simplex method
  E. Linear programming models
IV. Mathematics of Finance
  A. Simple and compound interest
  B. Annuities
  C. Amortization
  D. Exploration of global and ethical topics through applications of financial equations
V. Sets, Counting, and Probability
  A. Combinations and permutations
  B. Terminology and basic concepts of probability
  C. Dependent, independent, and mutually exclusive events
  D. Applications of counting methods and probability theory
VI. Statistics
  A. Frequency distributions
  B. Descriptive statistics
  C. Statistical displays of data
  D. Linear regression
  E. Analyzing and interpreting statistics in a global community

Course Requirements

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

Grading/exams

- A written final exam (60% application based) and at least one additional written exam (60% application based)
- A written project (example: research project, technology project, analysis of a real world problem) that includes written analysis.
- A minimum of one assignment worth a minimum 10% of the total course grade will allow students to demonstrate at least 5 of the 7 General Education Program outcomes.

Written Assignments: Students are required to use appropriate academic resources.

Other Course Information

Students will be given opportunities to collaborate via group work and/or oral presentation of problem solutions. This course is an approved General Education course in the Mathematics category. Please refer to the current CCBC Catalog for General Education course criteria and outcomes.

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