

**Common Course Outline**  
**MATH 125**  
**Finite Mathematics and Modeling**  
**3 Semester Hours**

**The Community College of Baltimore County**

**Description**

You will study applications of mathematics to business, management, science, health, and the social sciences. Covers linear functions, linear systems, matrices, probability, linear programming, mathematical models, simple and compound interest, annuities, amortization, and other selected topics. Prerequisites: MATH 083 or sufficient math placement score LVR2, and LVE1.

**Overall Course Objectives**

Upon successfully completing the course students will be able to:

1. calculate the slope of a line, derive the equation of a line given a point on the line and the slope, and graph a linear equation (I, 4);
2. construct a linear mathematical model for a given real life application, and interpret the meaning of the slope and the y-intercept (I,II,III,IV,1,2,4,6);
3. perform operations with matrices, and solve systems of equations using matrices (I,IV, 4);
4. graph the solution set for two or more linear inequalities in two unknowns (I,4 );
5. construct the constraints and the objective function for a linear programming problem from everyday life, solve using the graphical method, and interpret the solution (I,II,III,1,2,5,6);
6. use the simplex method to solve maximum and minimum linear programming problems from everyday life involving two or more variables, and interpret the solution (I,II,IV,V,1,2,3,5,6);
7. construct mathematical models for real world problems in finance that involve compound interest, annuities, and amortization, solve problems using the model, and interpret the solution (I,II,III,IV,V,VI ,1,2,4,6,7);
8. apply computer or calculator technology to the solution of mathematical problems (IV, 3,4);
9. count the number of possible outcomes for a given application using the fundamental principle of counting, permutations, and combinations (I,IV,4);
10. apply the definitions of dependent and independent events, mutually exclusive events, sample space, and probability to solving real world problems involving chance (I,VI, 1,5);
11. calculate probabilities using the addition rule, the product rule, and the complements rule, and calculate expected value for a chance experiment using real world situations (I,V,5,6,7);

## **Major Topics**

1. Linear Equations
  - a. Slope
  - b. Forms for linear equations
  - c. Find a linear equation to model given information
2. Matrices
  - a. Terminology
  - b. Perform basic operations using matrices
  - c. Using Technology
  - d. Gauss-Jordan Method
  - e. Gaussian Elimination Method
3. Linear Programming
  - a. Graph systems of linear inequalities
  - b. The Corner Point Theorem
  - c. Solve LP problems using the Graphical method
  - d. Solve LP problems using the Simplex method
4. Mathematics of Finance
  - a. Simple and Compound Interest
  - b. Annuities
  - c. Amortization
5. Probability
  - a. Combinations and Permutations
  - b. Terminology
  - c. Dependent, Independent, and Mutually Exclusive Events, and applications.

## **Course Requirements (General Education Goal #VII)**

Students will be given opportunities to collaborate via groupwork and/or oral presentation of problem solutions.

There will be multiple opportunities for the instructor to assess student progress through classwork and/or homework.

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

1. Two exams (60% applications based);
2. At least one graded homework assignment;
3. 3 quizzes;
4. One project (for example, Internet project, or research project).

## **Other Course Information**

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.

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