

Course Outline

MATH 121

Finite Mathematics

3 Semester Hours

HOWARD COMMUNITY COLLEGE

Description

In this course students will learn the language of sets and be introduced to counting theory, tree diagrams, probability, the binomial theorem, independence, Bayes' theorem, probability distributions, and random variables. Other topics include approximating data by linear models, graphing and analysis of systems of inequalities, matrix algebra and linear programming, and the mathematics of finance. Prerequisite: MATH 070 or appropriate math placement score. (3 hour weekly)

Statement on General Education and Liberal Learning

A liberal education prepares students to lead ethical, productive, and creative lives and to understand how the pursuit of lifelong learning and critical thinking fosters good citizenship. General education courses form the core of a liberal education within the higher education curriculum and provide a coherent intellectual experience for all students by introducing the fundamental concepts and methods of inquiry in the areas of mathematics, the physical and natural sciences, the social sciences, the arts and the humanities, and composition. This course is part of the general education core experience at Howard Community College.

Overall Course Objectives

Upon completion of this course, the student will have demonstrated the ability to:

1. Find linear best-fit models.
2. Solve a linear system of equations.
3. Perform matrix operations and solve applications using matrices.
4. Solve linear programming problems.
5. Use the simplex method to optimize linear functions in two or more variables subject to linear constraints in two or more variables.
6. Calculate present value and future values for compound interest.
7. Calculate present and future values of an annuity.
8. Calculate amortizations.
9. Use set theory, the principles of counting and probability concepts to calculate probabilities.
10. Use the binomial probability theorem.
11. Calculate and interpret expected values.

Major Topics

- I. Linear functions
 - A. Graphs
 - B. Applications
 - C. Linear regression
- II. Systems on linear equations and matrices
 - A. Solutions of linear systems
 - B. Addition and subtraction of matrices
 - C. Multiplication of matrices
 - D. Matrix inverses
- III. Linear programming
 - A. Graphing systems of linear inequalities
 - B. Linear programming
 - C. Graphical solution of linear programming problems
 - D. The Simplex method
- IV. Mathematics of finance
 - A. Compound interest
 - B. Annuities
 - C. Amortization
- V. Sets and counting
 - A. Sets and set operations
 - B. Multiplication principle
 - C. Permutations and Combinations
- VI. Probability and statistics
 - A. Rules of Probability
 - B. Counting techniques
 - C. Conditional probability and independence
 - D. Bayes theorem
 - E. Probability Distributions
 - F. Measures of central tendency and variation.

Course Requirements

Grading/Exams: Grading procedures will be determined by the individual faculty member within the guidelines of the Mathematics Division and will include several unit exams, projects and a comprehensive departmental final exam.

Technology requirements: Graphing calculator (TI-84 recommended) and required course software.

Other Course Information

This course may be used as a Mathematics core course or as an Arts and Science elective. Check with your transfer institution concerning transferability for your program.