

COURSE OUTLINE

MATH 131

College Algebra

3 Semester Hours

HOWARD COMMUNITY COLLEGE

Description

In this course, students will further develop their algebraic skills. The concept of a function as a tool to model the real world will play a central role. Polynomial, rational, exponential and logarithmic functions will be studied, along with techniques for solving equations and inequalities, complex numbers, operations on functions and inverse functions. A graphical approach will be utilized throughout, with an emphasis on solving application problems. Prerequisite: MATH 070 or appropriate score on math placement test.

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 be able to:

1. Use the basic properties and rules of the real number system to solve problems involving radical and absolute value expressions.
2. Evaluate and graph functions, some of which are altered by shifts, reflections, and/or transformations.
3. Perform the basic operations or find the composite of two or more functions.
4. Find and graph the inverse of a function.
5. Solve absolute value and non-linear inequalities.
6. Apply classic theorems to find the zeros of polynomial equations and graph its corresponding function.
7. Operate with complex numbers in standard (rectangular) form.
8. Graph rational functions.
9. Use exponents and logarithms to solve equations and application problems.
10. Solve application problems.
11. Use a scientific programmable graphing calculator in solving problems.
12. Find models that best fit a set of data.

Major Topics

- I. Graphs, Functions, and Models
 - A. Functions, and Graphs
 - B. Slope (Rate of Change)

- C. Curve Fitting, and Linear Regression
 - D. Analysis of Functions
 - E. Symmetry and Transformations
- II. Functions and Equations: Zeros and Solutions
- A. Complex Numbers
 - B. Quadratic Like Functions
 - C. Analyzing Graphs of Quadratic Functions
 - D. Quadratic Regression
 - E. Radical and Absolute Value Equations
 - F. Solving Inequalities
- III. Polynomial and Rational Functions
- A. Polynomial Functions and Modeling
 - B. Polynomial Division; The Remainder and Factor Theorems
 - C. Theorems about Zeros of Polynomial Functions
 - D. Rational Functions
 - E. Polynomial and Rational Inequalities
 - F. Modeling with Polynomial Functions
- IV. Exponential and Logarithmic Functions
- A. Composite and Inverse Functions
 - B. Exponential Functions and Graphs
 - C. Logarithmic Functions and Graphs
 - D. Properties of Logarithmic Functions
 - E. Solving Exponential and Logarithmic Equations
 - F. Applications and Models: Growth and Decay
 - G. Modeling with Exponential, Logarithmic and Logistic Functions.

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.