

COURSE OUTLINE

MATH-133

College Trigonometry

3 Semester Hours

HOWARD COMMUNITY COLLEGE

Description

This course is the second part of a two course sequence in precalculus. Students will develop skills in basic trigonometry and its applications, with an emphasis on modeling with functions and other algebraic skills necessary for the study of calculus. Trigonometry will be defined using the unit circle approach, with emphasis on the geometry of the circle. Classical right triangle trigonometry will be studied, along with trigonometric identities and equations, the laws of sines and cosines, graphs and properties of the trigonometric functions and their inverses, parametric equations, trigonometric form of complex numbers, De Moivre's theorem and polar coordinates. Additional topics from algebra will include sequences and series. A graphical approach will be utilized throughout, with an emphasis on solving application problems. Prerequisite: MATH 131.

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. Define and graph the trigonometric functions and their inverses.
2. Prove or disprove trigonometric identities and solve trigonometric equations.
3. Apply sum and difference, double angle, half-angle trigonometric formulas and the standard trigonometric identities.
4. Use the Law of Sines and Cosines.
5. Operate with complex numbers in trigonometric form.
6. Apply De Moivre's Theorem.
7. Find trigonometric models that best fit a set of data.
8. Apply and graph parametric equations.
9. Determine and apply arithmetic and geometric sequences
10. Manipulate series and summation notation
11. Solve application problems.
12. Use a scientific programmable graphing calculator in solving problems.

Major Topics

- I. Trigonometry
 - A. The Unit Circle
 - B. Graphs and Properties of Circular Functions
 - C. Angles and Rotations
 - D. Right Triangle Trigonometry
 - E. Graphs of Transformed Trigonometric Functions
 - F. Fundamental Trigonometric Identities
 - G. Proving Trigonometric Identities
 - H. Sum and Difference, Double Angle, and Half-Angle Formulas
 - I. Inverses of the Trigonometric Functions
 - J. Solving Trigonometric Equations

- II. Applications
 - A. Right Triangle Applications
 - B. Law of Sines and Cosines
 - C. Modeling Periodic Phenomena
 - D. Trigonometric Form of Complex Numbers
 - E. De Moivre's Theorem and nth Roots
 - F. Polar Coordinates
 - G. Parametric Equations

- III. Sequences and Series
 - A. Recursive and nth Term Definition of a Sequence
 - B. Arithmetic Sequences
 - C. Geometric Sequences
 - D. Series and Summation Notation
 - E. Infinite Geometric Series

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, TI-89 not permitted) 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.