

HOWARD COMMUNITY COLLEGE - COURSE OUTLINE

MATH 133 College Trigonometry 3 Semester Hours

Description

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, Demoivre'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. The use of a graphing calculator is required. (TI-83 Plus recommended. Calculators with computer algebra systems will not be allowed.)

Prerequisite: MATH 131 or appropriate score on math placement test or equivalent.

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 DeMoivre'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. Area of Oblique Triangles
- D. Modeling Periodic Phenomena
- E. Trigonometric Form of Complex Numbers
- F. DeMoivre's Theorem and Nth Roots
- G. Polar Coordinates
- H. 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

Other Course Information

MATH 133 is a prerequisite course for the main calculus sequence, MATH 140/150 , intended primarily for mathematics, science and engineering majors. If you are a business, social science or humanities major, your interests may be better served by taking MATH 145 (Business Calculus) or MATH 138 (Statistics). Contact the counseling center and your transfer institution for more specific information.

Course Requirements

Required Text: Contemporary Precalculus: A Graphing Approach, 4th ed. by Hungerford

Required Calculator: Graphing Calculator (TI-83 Plus recommended. Calculators with a computer Algebra system, such as Derive, will not be allowed)

Grading/Exams: Grading procedures will be determined by the individual faculty member but will be based on several unit exams and a comprehensive final exam.