



COURSE OUTLINE OF RECORD

Number: MATH A120

TITLE: Trigonometry

ORIGINATOR: Tab Livingston

EFF TERM: Fall 2016

FORMERLY KNOWN AS:

DATE OF

OUTLINE/REVIEW: 12-02-2015

CROSS LISTED COURSE:

TOP NO: 1701.00

CID:

SEMESTER UNITS: 3.0

HRS LEC: 54.0

HRS LAB: 0.0

HRS OTHER: 0.0

CONTACT HRS TOTAL: 54.0

STUDY/NON-CONTACT HRS RECOMMENDED: 108.0

CATALOG DESCRIPTION:

Topics covered will be trigonometric (circular) and inverse trigonometric functions, graphs of trigonometric functions, identities and conditional equations, solutions for triangles, vectors, complex numbers and applications. May be taken for grades or on a pass-no pass basis. ADVISORY: Mathematics A020. Transfer Credit: CSU.

JUSTIFICATION FOR COURSE:

Prerequisite for lower division transfer math courses.

PREREQUISITES:

- Appropriate OCC Math Placement Score.
- or
- MATH A030: Intermediate Algebra with a minimum grade of C or better

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:

Mathematics

MATERIAL FEE: Yes [] No [X] Amount: \$0.00

CREDIT STATUS: Noncredit [] Credit - Degree Applicable [X] Credit - Not Degree Applicable []

GRADING POLICY: Pass/No Pass [X] Standard Letter [X] Not Graded []

OPEN ENTRY/OPEN EXIT: Yes [X] No []

TRANSFER STATUS: CSU Transferable[X] UC/CSU Transferable[] Not Transferable[]

BASIC SKILLS STATUS: Yes [] No [X] **LEVELS BELOW TRANSFER:** Not Applicable

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE: E

REPEATABLE ACCORDING TO STATE GUIDELINES: No [X] Yes [] **NUMBER REPEATS:**

REQUIRED FOR DEGREE OR CERTIFICATE: No [X] Yes []

GE AND TRANSFER REQUIREMENTS MET:

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

2A: Mathematic

CSU GE Area A: Communication in the English Language and Critical Thinking

A2 - Written Communication

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning

B4 - Mathematics/Quantitative Thinking

OCC AA Gen Ed

AREA A2: LANGUAGE AND RATIONALITY - Communication and Analytical Thinking

OCC AS Gen Ed

AREA A2 – ENGLISH COMMUNICATION - Communication and Analytical Thinking

COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. State the definitions, properties, and basic identities of the six trig functions.
2. Solve trigonometric equations and identities using algebraic relationships among the six trigonometric functions.
3. Solve right triangles and oblique triangles using the appropriate trig method.

COURSE OBJECTIVES:

1. Define angles and the trigonometric functions.
2. Recognize fundamental relationships of the trigonometric functions.
3. Identify special triangles and their related angle and side measures.
4. Recognize trigonometric function values of special angles in degrees and radians.
5. Find trigonometric function values of any measure (in degrees or radians) using a calculator.
6. Solve applications using right triangle trigonometry.
7. Solve trigonometric applications using vectors.
8. Convert radian to degree measure and degree to radian measure.
9. Apply circular functions to the unit circle.
10. Graph functions involving $\sin x$, $\cos x$, $\tan x$, $\cot x$, $\sec x$, and $\csc x$, applying changes in period, amplitude and phase shift.
11. Use identities to manipulate and simplify trigonometric expressions.
12. Prove trigonometric identities.
13. Prove identities involving the sum and differences of two angles.
14. Prove the half angle identities and the double angle identities.
15. Solve trigonometric equations.
16. Evaluate and graph inverse sine, inverse cosine, and inverse tangent functions.
17. Solve triangles and applications involving the law of cosines or law of sines.
18. Calculate the area of triangles using trigonometric functions.
19. Graph complex numbers.
20. Change complex numbers from standard to trigonometric form.
21. Use De Moivre's theorem to find powers of a complex number.
22. Find roots of complex numbers.
23. Represent vectors in $\langle a, b \rangle$ and $ai + bj$ form.
24. Calculate the dot product of two vectors.
25. Convert between polar and rectangular coordinates and equations.
26. Sketch graphs of polar equations.

COURSE CONTENT:

LECTURE CONTENT:

It is imperative that instructors cover all topics in the outline in order to prepare the students for Math A170. The instructor may determine the order of topics. The department encourages the instructor to incorporate the graphing calculator wherever it is appropriate.

- A. Review of relevant intermediate algebra (as needed)
 - 1. Rectangular coordinates
 - 2. Relations and functions
 - 3. Graphs of relations and functions
 - 4. Zeros of functions
 - 5. Sum, product, quotient and composite functions
 - 6. Inverse functions and their graphs
- B. Trigonometric functions
 - 1. Define angles, degrees and special triangles
 - 2. Define trigonometric functions of angles in standard position in the rectangular coordinate system
 - 3. Define trigonometric functions as ratios of sides of a right triangle
 - 4. Solve right triangles and applications
 - 5. Solve applications of trigonometric functions
- C. Circular functions
 - 1. Define reference angle
 - 2. Define radians and degrees
 - 3. Define trigonometric functions based on the unit circle
 - 4. Calculate circular function values for radians and degrees
 - 5. Solve applications of circular functions
 - a. arc length
 - b. area of sector
 - c. linear and angular velocity
- D. Graphing and inverse trigonometric functions
 - 1. Graph basic trigonometric functions
 - 2. Graph using changes in:
 - a. period
 - b. amplitude
 - c. phase shift
 - d. vertical translation
 - e. asymptotes
 - 3. Inverse trigonometric functions and their graphs
- E. Prove and apply identities to manipulate and simplify trigonometric expressions
 - 1. Pythagorean
 - 2. Sum and difference formulas
 - 3. Double angle formulas
 - 4. Half-angle formulas
- F. Equations
 - 1. Solve trigonometric equations
 - 2. Solve trigonometric equations involving multiple angles
 - 3. Parametric equations
 - 4. Graph parametric curves
- G. Solve applications of triangles involving
 - 1. Law of sines
 - 2. Law of cosines
 - 3. Areas of triangles
- H. Vectors
 - 1. Define vectors geometrically
 - 2. Define vectors in the forms $\langle a, b \rangle$ and $a\mathbf{i} + b\mathbf{j}$
 - 3. Addition, subtraction, Scalar multiplication of vectors

4. Dot product
- I. Complex numbers
 1. Define complex numbers
 2. Addition, subtraction, multiplication and division in $a + bi$ form
 3. Represent complex numbers in trigonometric form
 4. Products and quotients in trigonometric form
 5. De Moivre's theorem
 6. Roots of complex numbers
- J. Polar coordinates
 1. Define polar coordinates
 2. Convert from rectangular to polar, and from polar to rectangular coordinates
 3. Convert from rectangular to polar, and from polar to rectangular equations
 4. Graph basic polar equations

LABORATORY CONTENT:

METHODS OF INSTRUCTION:

- A. Lecture:
- B. Independent Study:

INSTRUCTIONAL TECHNIQUES:

Lecture, discussion, written homework

COURSE ASSIGNMENTS:

Reading Assignments

Students will spend approximately 1 hour per week reading from assigned text.

Out-of-class Assignments

Students will spend approximately 4 hours per week on out-of-class assignments, including reading and written homework involving problem solving exercises.

Writing Assignments

Students will spend approximately 1 hour per week on writing assignments.

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Objective Examinations
Problem Solving Exercises

Demonstration of Critical Thinking:

Exams covering several units and a comprehensive final exam

Required Writing, Problem Solving, Skills Demonstration:

Writing is encouraged throughout the course but is not necessarily a part of the grading or exams.

TEXTS, READINGS, AND RESOURCES:

TextBooks:

1. McKeague, Charles P . *Trigonometry*, 7TH ed. Pacific Grove: Brooks/Cole-Thomson Learning, 2013

Other:

1. Other appropriate textbook as chosen by faculty.

LIBRARY:

Adequate library resources include: Print Materials
Non-Print Materials
Online Materials
Services

Comments:

Attachments:

[Attached Files](#)