MATH C120: TRIGONOMETRY

Item	Value
Top Code	170100 - Mathematics, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Local General Education (GE)	• Area 2 Mathematical Concepts and Quantitative Reasoning (CA3)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B4 Math/Quant.Reasoning (B4)

Course Description

Circular functions, trigonometric identities and graphs, inverse functions, triangles, vectors, applications, and imaginary and complex numbers. PREREQUISITE: A course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU; UC. C-ID: MATH 851.**C-ID:** MATH 851.

Course Level Student Learning Outcome(s)

1. Identify and apply the laws and functions for trigonometric functions and inverse trigonometric functions.

Course Objectives

- 1. Read, interpret, and use the vocabulary, symbolism, and basic definitions of angle measurement, including degrees and radians, the six trigonometric functions, parts of triangles and circles, and the various types of triangles;
- 2. Identify special triangles and their related angle and side measures;
- 3. Manipulate and simplify a trigonometric expression by applying the laws and formulas that result directly from the definitions, including the fundamental identities, properties of angles and triangles, and characteristics of the trigonometric functions and inverse trigonometric functions;
- 4. Graph the basic trigonometric functions and apply changes in period, phase, and amplitude to generate new graphs;
- 5. Evaluate and graph inverse trigonometric functions;
- 6. Prove trigonometric identities;
- 7. Solve various types of triangle problems, distance and navigation problems, and linear and angular velocity problems;
- 8. Use appropriate technology such as calculators or computer software to enhance mathematical thinking, visualization, and understanding to solve mathematical problems and to judge the reasonableness of the results;
- 9. Demonstrate quantitative reasoning skills by developing convincing arguments and by communicating mathematically both verbally and in writing;
- 10. Convert between polar and rectangular coordinates and equations;
- 11. Graph polar equations;
- 12. Calculate powers and roots of complex numbers using DeMoivre's Theorem; and
- 13. Represent a vector in the form of and ai + bj.

Lecture Content

ANGLES AND THE TRIGONOMETRIC FUNCTIONS Angles and Degree Measure Radian Measure, Arc Length and Area Angular and Linear Velocity Trigonometric Functions Right Triangle Trigonometry Fundamental Identity and Reference Angles GRAPHS OF THE TRIGONOMETRIC FUNCTIONS INCLUDING PERIOD, AMPLITUDE, PHASE SHIFTS, AND ASYMPTOTES Unit Circle and Graphing General Sine Wave Graphs of the Secant and Cosecant Functions Graphs of the Tangent and Cotangent Functions Combining Functions TRIGONOMETRIC IDENTITIES Basic Identities Verifying Identities Sum and Difference Identities for Cosine Sum and Difference Identities for Sine and Tangent Double-Angle and Half-Angle Identities Product and Sum Identities Simplification of Trigonometric Expressions SOLVING CONDITIONAL TRIGONOMETRIC EQUATIONS Inverse Trigonometric Functions Basic Sine, Cosine, and Tangent Equations Multiple Angle Equations Trigonometric Equations of Quadratic Type APPLICATIONS OF TRIGONOMETRY Law of Sines Law of Cosines Area of a Triangle Vectors Applications of Vectors COMPLEX NUMBERS, POLAR COORDINATES, AND PARAMETRIC EQUATIONS Complex Numbers Trigonometric Form of Complex Numbers Powers and Roots of Complex Numbers using DeMoivre's Theorem Polar Equations

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)
- Video one-way (ITV, video) (63)

Instructional Techniques

Deliver lectures of course content. Assign homework and quizzes. Relate material in the course to real life and the outside world. Require participation including student-to-student and student-to-instructor interaction through the use of small-group activities and whole-class discussion. Apply technologies to increase learner motivation such as Scientific and/or Graphing Calculator and computer software such as Wolfram

Reading Assignments

Alpha. Objective Examinations Midterm Exam (comprehensive) Final Exam (comprehensive)

Writing Assignments

Do homework exercises and take online quizzes.

Out-of-class Assignments

Read assigned sections from the textbook.

Demonstration of Critical Thinking

Final Exam Midterm Exam Objective Examinations Problem Solving Exercises Projects (ind/group) Report Short Quizzes Skills Demonstration Written Assignments

Required Writing, Problem Solving, Skills Demonstration

Solve word problems.

Eligible Disciplines

Mathematics: Master's degree in mathematics or applied mathematics OR bachelor's degree in either of the above AND master's degree in statistics, physics, or mathematics education OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Dugopolski, Mark. Trigonometry, 4th ed. Pearson, 2015 Rationale: - 2. Required OpenStax. Precalculus, 1st ed. Rice University, 2017 3. Required McKeague, Charles P. Trigonometry, ed. XYZ Textbooks, 2020

Other Resources

1. Coastline Library 2. Coastline Student Handbook for Telecourse students. 3. MyMathLab access code 4. Digital Video Tutor 5. Student Solutions Manual 6. MyOpenMath