MATH G120: TRIGONOMETRY

Item	Value
Curriculum Committee Approval Date	03/03/2020
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
Grading Policy	Standard Letter (S)
Local General Education (GE)	• GWC Mathematic Competency (GB2)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B4 Math/Quant.Reasoning (B4)

Course Description

This course is a study of the circular and trigonometric functions. The topics include inverses, graphs, solutions of triangles, conditional equations, identities, vectors, complex numbers, polar coordinates, parametric equations, and applications of these concepts. A scientific calculator is recommended. PREREQUISITE: Course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Use trigonometric identities to simplify or evaluate trigonometric expressions.
3. Graph functions of the type y = A trig (Bx+C) + D.
4. Solve trigonometric equations.

Course Objectives

- 1. Define the six trigonometric functions according to the right triangle, unit circle, and rectangular coordinate system.
- 2. Evaluate function values of special angles given in both degree and radian measures without the use of tables or calculators.
- 3. Evaluate function values of any angle.
- 4. Solve right and oblique triangles and use such techniques to solve applied problems.
- 5. Prove identities and use them to simplify or evaluate trigonometric expressions.
- 6. Graph trigonometric functions: period, amplitude, phase shift, and asymptotes.
- 7. Define, graph, and evaluate inverse trigonometric functions.
- 8. Perform basic operations of geometric and algebraic vectors (quantities with magnitude and direction) in the forma,b > and ai+bj.
- 9. Use vectors to solve applied problems.
- 10. Perform basic operations of complex numbers in both standard and trigonometric form.
- 11. Calculate powers and roots of complex numbers using DeMoivres Theorem.
- 12. Graph equations in polar and parametric form.
- 13. Use the calculator in conjunction with the objectives stated above.
- 14. Convert between polar and rectangular coordinates and equations.

Lecture Content

Preliminary concepts. Sets Angles Radian and degree measure. Basics of trigonometric functions Definitions according to right triangle Unit Circle Rectangular coordinate system. Functions values for special angles. Function values for all angles. Circular functions Definitions Function values Arclength and area of a sector. Uniform circular motion. Solving triangles. Right triangles. Oblique triangles using Law of Sines and Cosines. Applicaitons. Graphing trigonometric functions Basic graphs Graphing y=A trig(Bx+C) + D period amplitude phase shift asymptotes Finding the equation from the graph Identities Basic ratio and Pythagorean identities Sum and difference identities Double and half-angle identities Proving identities Conditional Equations Basic Using identities Multiple angle Applications Inverse trigonometric functions. Definitions Domains and ranges Function values Graphs Vectors Geometric approach Algebraic approach Applications Complex numbers Basic operations Trigonometric form DeMoivres Theorem Finding n-th roots Polar coordinates Conversion from rectangular to polar and vice versa. Graphing Parametric equations Eliminating the parameter Graphing Applications

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Instructional Techniques

Lecture, discussion, cooperative and inquiry-based learning methods.

Reading Assignments

Course textbook which provides explanations, worked examples, and problems to be solved.

Writing Assignments

Homework, quizzes, and examinations covering topics presented in the course.

Out-of-class Assignments

Computer assignments may be required. These will consist of individual laboratory assignments designed to further illustrate concepts presented in the lecture.

Demonstration of Critical Thinking

Students will demonstrate critical thinking and problem-solving skills by using logic, in conjunction with past mathematical solving techniques, to solve and interpret a variety of applications not previously seen. Demonstrations will be shown by completing assignments, participating in discussions, and completing required exams and quizzes

Required Writing, Problem Solving, Skills Demonstration

Homework, quizzes, and examinations covering topics presented in the course.

Eligible Disciplines

Mathematics: Masters degree in mathematics or applied mathematics OR bachelors degree in either of the above AND masters degree in statistics, physics, or mathematics education OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Lial, Hornsby, Schneider, Daniels. Trigonometry, 11th ed. Pearson, 2017 2. Required Abramson, Jay. Algebra and Trigonometry , 1 ed. OpenStax (OER), 2015

Other Resources

1. Scientific calculator required.