



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Mathematics 170
Descriptive Title: Trigonometry
Course Disciplines: Mathematics
Division: Mathematical Sciences

Catalog Description:

This course includes a study of trigonometric functions, their inverses, identities, equations, complex numbers, graphs, and applications.

Note: One year of high school geometry is equivalent to Mathematics 60.

Conditions of Enrollment:

Prerequisite: Mathematics 60 AND Mathematics 80 with a minimum grade of C in prerequisite or qualification by appropriate assessment

Course Length:	X Full Term	Other (Specify number of weeks):
Hours Lecture:	3.00 hours per week	TBA
Hours Laboratory:	0 hours per week	TBA
Course Units:	3.00	

Grading Method: Letter
Credit Status: Associate Degree Credit

Transfer CSU: X Effective Date: Prior to July 1992
Transfer UC: No

General Education:

El Camino College:

4B – Language and Rationality – Communication and Analytical Thinking

Term: Other: Approved

6 – Mathematics Competency

Term: Other: Approved

CSU GE:

B4 - Mathematics/Quantitative Thinking

Term: Fall 1999 Other:

IGETC:

II. OUTCOMES AND OBJECTIVES

A. **COURSE STUDENT LEARNING OUTCOMES** (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

SLO #1 UNDERSTANDING CONCEPTS

Students will explain and demonstrate basic trigonometric concepts and definitions.

SLO #2 SOLVING PROBLEMS

Students will solve trigonometric application problems, including those involving the laws of sines and cosines.

SLO #3 GRAPHS

Students will create, interpret and analyze the graphs of trigonometric functions and their inverses.

SLO #4 PROOFS

Students will analyze and construct proofs of trigonometric identities.

B. **Course Student Learning Objectives** (The major learning objective for students enrolled in this course are listed below)

1. Define trigonometric functions using the unit circle and right triangles.
2. Evaluate trigonometric functions and inverses, both with and without technology.
3. Solve problems involving angles and right triangles.
4. Graph trigonometric functions and their inverses.
5. Prove trigonometric identities and use them to solve problems.
6. Solve trigonometric equations.
7. Use the laws of sines and cosines to solve problems involving non-right triangles.
8. Perform vector arithmetic and solve problems using vectors.
9. Multiply and divide complex numbers in trigonometric form.

III. **OUTLINE OF SUBJECT MATTER** (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	8	I	FUNDAMENTALS OF TRIGONOMETRY A. Radian and degree measure of angles B. Trigonometric functions: Unit circle definition C. Trigonometric functions: Right Triangle definition D. Reference angles
Lecture	10	II	GRAPHING AND INVERSE FUNCTIONS A. Basic graphs of the six trigonometric functions B. Amplitude, reflection and period C. Vertical and horizontal translations D. Finding equations from graphs E. Inverse trigonometric functions

Lecture	8	III	IDENTITIES A. Proofs and derivations B. Sum and difference formulas C. Double angle formulas D. Half angle formulas
Lecture	8	IV	EQUATIONS A. Solving basic trigonometric equations B. Solving using algebraic techniques such as factoring and quadratic formula C. Solving using identities D. Solving equations involving multiple angles
Lecture	6	V	VECTORS A. Geometric and Algebraic Representations B. Addition, Subtraction and Scalar Multiplication
Lecture	10	VI	APPLICATIONS A. Solving Right Triangles B. Arc length C. Linear and angular speeds D. Angles of elevation and depression E. Heading, bearing and navigation F. Law of Sines and Law of Cosines
Lecture	4	VII	COMPLEX NUMBERS A. Convert between standard form and trigonometric form B. Products and quotients in trigonometric form
Total Lecture Hours		54	
Total Laboratory Hours		0	
Total Hours		54	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

Find the values (if possible) of the six trigonometric functions of Θ , using the following conditions:
 $\sin(\Theta) = (3/5)$ and Θ lies in the second quadrant.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Verify the identity $(1/(\cot(x)+1)) + (1/(\tan(x)+1)) = 1$.
2. Forces of magnitude 35 pounds and 50 pounds act on a hook. The angle between the two forces is 30 degrees. Find the direction and magnitude of the resultant force.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Objective Exams
 Other exams
 Quizzes
 Written homework
 Homework Problems

V. INSTRUCTIONAL METHODS

Discussion
Lecture

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study
Answer questions
Skill practice
Required reading
Problem solving activities

Estimated Independent Study Hours per Week: 6

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

McKeague, Charles, and Mark Turner. Trigonometry, 8th Edition. Cengage, 2017.

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

Graphing or Scientific Calculator

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
Course Prerequisite Mathematics-60 AND	Sequential
Course Prerequisite Mathematics-80 or	Sequential
Non-Course Prerequisite	

B. Requisite Skills

Requisite Skills
A. Use the properties of right triangles to solve problems. MATH 60 - Use the properties of right triangles to solve problems.
B. Formulate and prove conjectures using deductive reasoning. MATH 60 - Formulate and prove conjectures using deductive reasoning.
C. Solve algebra-level equations. MATH 80 - Solve a variety of equations and inequalities, as well as systems of equations and inequalities, using algebraic and graphical methods. Types of equations include linear, quadratic, polynomial, rational, radical, exponential and logarithmic equations.

D. An understanding of functional relationships. MATH 80 - Recognize functional relationships in the form of graphs, data or symbolic equations.
E. Ability to graph a variety of algebra-level functions. MATH 80 - Graph a variety of functions and relations and draw connections between these graphs and solutions to problems.

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
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D. Recommended Skills

Recommended Skills

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by Robert Horvath on 10/01/1980.

BOARD APPROVAL DATE:

LAST BOARD APPROVAL DATE: 12/21/2020

Last Reviewed and/or Revised by: Dominic Fanelli on 10/20/2020

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