MATH 0008 - TRIGONOMETRY

SECTION A

1. Division:	Sciences & Mathematics
2. Subject Code:	MATH
3. Course Number:	0008
4. Course Title:	TRIGONOMETRY
5. Semester of First Offering:	FALL 2013

SECTION B   General Course Information

1.Units: 4.0   **Variable Units:** N/A

2.This Course is: Degree-Applicable Credit - Transferable

3A. Cross-List: **3B. Formerly:**
                                                    MATH 0000C

Course Format and Duration

4. Standard Term Hours per Week		**5. Standard Term Total Semester Hours**	
Lecture/Discussion:	4	Lecture/Discussion:	72
Lab:		Lab:	
Activity:		Activity:	
By Arrangement:		By Arrangement:	
Total Hours per Week:	4	**Total Hours :**	72

6. Minimum hours per week of independent work done outside the class: 8

Course Preparation - (Supplemental form B required)

7a. Prerequisite(s): (Course and/or other preparation/experience that is <u>REQUIRED</u> to be completed previous to enrollment in this course.)

Completion of MATH D with grade of "C" or better, or placement by matriculation assessment process

7b. Co-requisite(s): (Courses and/or other preparation that is REQUIRED to be taken concurrently with this course.)

7c. Advisory: (MINIMUM preparation RECOMMENDED in order to be succesful in this course. Also known as "Course Advisory".)

Catalog Description And Other Catalog Information:

8. Repeatability: **Not Repeatable**

Please note: Repeatability does <u>not</u> refer to repeating courses because of substandard grades or a lapse of time since the student took the course. A course may be repeated <u>only</u> if the course content differs each time it is offered and the student who repeats it is gaining an expanded educational experience as stipulated in Title V.

- ☐ Skills or proficiencies are enhanced by supervised repetition and practice within class periods.
- ☐ Active participatory experience in individual study or group assignments is the basic means by which learning objectives are attained.
- ☐ Course content differs each time it is offered.

Explanation for above repeatability selection:

9a. Grading Option: Standard Grade

9b. Catalog Description:

Fundamentals of trigonometry. Topics include review of algebraic functions, definitions of trigonometric and circular functions, graphs, identities and applications. Other material includes solving trigonometric equations, solving triangles using the Laws of Sines and Cosines, vectors, polar coordinates and graphs, polar representations of complex numbers and conic sections.

Course Outline Information

10. Student Performance Objectives: (Performance objectives for all credit courses must indicate that students will learn critical thinking and will be able to apply concepts at college level.Performance objectives must be related to items listed in Section 11.)

Upon completion of this course, the student will be able to:
1. Analyze basic algebraic functions by graphing, evaluating, composing and finding inverses;
2. Evaluate the six trigonometric functions of special angles and their inverses;
3. Graph basic trigonometric functions and their transformations and have the ability to identify extreme values, zeros, period, asymptotes and transformations;
4. Verify trigonometric identities using valid substitutions and algebraic manipulations;
5. Generate solutions to trigonometric equations including the use of trigonometric identities;
6. Solve right and oblique triangles and related applications;
7. Use polar coordinate system to graph polar equations and evaluate roots and powers of complex numbers;
8. Perform basic operations on vectors including the dot product and solve simple applied problems using vectors;
9. Analyze and graph conic sections in rectangular and polar form;
10. Sketch parametric curves and convert parametric equations into rectangular form.

11. Course Content Outline: (Provides a comprehensive, sequential outline of the course content, including all major subject matter and the specific body of knowledge covered.)

I.Review of Algebra
A.Graphing
1.Lines
2.Transformations of Basic Algebraic Curves
B.Functions
1.Notation and Evaluation
2.Inverse Functions
3.Composition of Functions
II.Basic Trigonometric Functions
A.Right Triangles
B.Unit Circle
C.Graphing Trigonometric Functions
D.Trigonometric Identities
1.Verify Identities
2.Reciprocal, Ratio, Pythagorean, Sum, Difference, Double Angle, Half Angle
E.Application Problems
III.Analytic Trigonometry
A.Inverse Trigonometric Functions
B.Solving Trigonometric Equations
1.Use Radian and Degree Measurement
2.Solve with and without a Calculator
3.Use Identities to Solve
C.Oblique Triangles
1.Solve Using Law of Sines
2.Solve Using Law of Cosines
IV.Additional Topics
A.Polar Coordinates
B.Graphs of Polar Equations
C.Complex Numbers
1.Polar Form of Complex Numbers
2.DeMoivre's Theorem
D.Vectors
1.Combine Vectors Geometrically and Algebraically
2.Dot Product
3.Application Problems
V.Analytic Geometry
A.Conic Sections
1.Rectangular Form
2.Polar Form
B.Parametric Curves

12. Typical Out-of-Class Assignments: (Credit courses **require** two hours of independent work outside of class for each lecture hour, less lab/activity classes. List type of assignments including library assignments.)

a. Reading Assignments: (Submit at least 2 examples.)
1. Read selected topics throughout the course from the textbook, such as how to model periodic behavior like simple harmonic motion using trigonometric functions.
2. Read supplementary handouts on topics such as the techniques of proving trigonometric identities.

b. Writing, Problem Solving or Performance: (Submit at least 2 examples)

1. After reading simple harmonic motion, create and draw sine and cosine waves to model objects in simple harmonic motion.
2. Solve application problems in class such as finding missing forces on an object in static equilibrium using the concept of vectors.

c. Other (Term projects, research papers, porfolios, etc.)

13. Required Materials:

a. All textbooks, resources and other materials used in this course are college level?

☑ Yes
☐ No

b. Representative college-level textbooks (for degree applicable courses) or other print materials:

Book 1:

Author:	Sullivan & Sullivan
Title:	Trigonometry A Right Triangle Approach
Publisher:	Prentice Hall
Date of Publication:	2008
Edition:	5th

c. Other materials and/or supplies required of students:
Scientific calculator.

14. Check all Instructional methods used to present course content:

☑ Lecture ☐ Activity
☑ Discussion Semminar ☑ Distance Education (requires supplemental form)
☐ Lab ☐ Work Experience
☑ Directed Study ☐ Tutoring

Other:

Give detailed examples of teaching methodology that relate to the course performance objectives:
Example 1: In a lecture format, the instructor will draw triangular figures, write charts with numerical patterns, reference to circular diagrams, implement the use of flashcards, and use hands-on manipulatives to help students evaluate six trigonometric functions at their special angles.

Example 2: Instructor provides a lecture on the Law of Sines or Cosines. The instructor then divides students into small groups and introduces a collaborative learning activity using the Law of Sines or the Law of Cosines. Students will focus on how to solve a triangular model with missing distances and angles. Students will practice reading scenarios, drawing appropriate diagrams, and developing a solution with peers.

Example 3: In a class discussion involving algebra, the instructor will have students recognize, manipulate, and compare equations in rectangular form that represent conic sections.

15. Methods of Assessing Student Learning
15a. Methods of Evaluation:

☐	Essay Exam	☐	Reports
☐	Objective Exam	☑	Problem Solving Exam
☐	Projects	☑	Skill Demonstration
☑	Class Discussion	☐	Other

15b. (All courses must provide for measurement of student performance in terms of stated student performance objectives, Area 10, and culminate in a formal recorded grade based on uniform standards. Submit at least 2 examples.)

Example 1. Find the nth roots of a complex number. This problem is graded based on the clarity, completeness, and correctness of the method used and of the roots found.

Example 2. Solve trigonometric equations using identities and algebraic manipulation. This question is graded based on the clarity, completeness, and correctness of the method used and of the solutions found.

Example 3: Solve triangles using the Pythagorean Theorem and the Laws of Sines and Cosines. This question is graded based on the clarity, completeness, and correctness of the method used and of the solutions found.

SECTION C

1. Program Information:
- ☑ In an approved program
- ☐ Part of a new program
- ☐ Not part of an approved program

2. TOP Code Information
Program Title: Mathematics, General 170100

3. Course SAM Code:
- ☐ A - Apprenticeship Course
- ☐ B - Advanced Occupational
- ☐ C - Clearly Occupational
- ☐ D - Possibly Occupational
- ☑ E - Non-Occupational

4. Faculty Minimum Qualifications/Degrees:

Mathematics

Comments:

SECTION D

General Education Information:

1. College Associate Degree GE Applicability:

Math Competency

2. CSU GE Applicability: Communication & Analytic Thinking

B-4 Mathematics/Quantitative Reasoning

3. IGETC Applicability:

4. CAN :

5. LDTP:

SECTION E

1. Articulation Information: (Required for Transferable Courses Only)

- ☑ CSU Transferable
- ☐ UC Transferable
- ☐ CSU/UC Major Requirement.

  If CSU/UC major requirement, list campus and major. (Note: Must be lower division)

2. List at least one community college and its comparable course. If requesting CSU and/or UC transferability also list a CSU/UC campus and comparable lower division course

Butte College (Math 20)
Sacramento City College (Math 334)
California Polytechnic State University (Math 119)

SECTION F

Planning and Resources: Please address the areas below:

1. Evidence of Need or Potential: recommendations of advisory committee, connection to existing or planned degrees/certificates, or regional/national developments, transfer university requirements.

Used to satisfy an AA degree requirement.

2. Appropriateness to Mission: connection to basic skills, transfer, career technical education, or lifelong learning; relationship

Transfer level math class to CSU.

3. Place in Program/Department: relationship to student learning outcomes identified by program, connection to general education, or articulation with other institutions.

Meets GE applicability for Math Competency. Course includes all four Math SLO's (Equations and Expressions, Visual Models, Applied Problems, Communication).

4. Availability of Faculty and Facilities: minimum qualifications to teach course, special training for instructors, or long-term physical impact of course.

All math faculty members meet the minimum qualifications to teach this course. No special training would be required.

5. Potential Impact on Resources: impact on library, computer support, transportation, equipment, or other needs

Classroom space, FTEs.

SECTION G

1. Maximum Class Size (recommended):   35

2. If recommended class size is not standard, then provide rationale: