EL CAMINO COLLEGE
COURSE OUTLINE OF RECORD

I. COURSE DESCRIPTION

Course Title and Number: Mathematics 170 (Official)
Descriptive Title: Trigonometry
Discipline: Mathematics
Division: Mathematical Sciences
Course Length: Full Term

Hours Lecture: 3
Hours Laboratory: 0
Course Units: 3
Grading Method: Letter

Course Type: Credit, Degree Applicable
Transfer CSU: Yes (Effective Date: Prior to 7/92)
Transfer UC: Yes (Approval Date: )

Conditions of Enrollment: Specify Prerequisite, Corequisite, Recommended Preparation, Enrollment Limitation, or None.

Prerequisite: Mathematics 60 and Mathematics 80 with a minimum grade of C in prerequisite, or qualification by testing (El Camino College Mathematics Placement Test) and assessment

Catalog Description:

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

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

List the major objectives of the course. These must be stated in behaviorally measurable terms.

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 using angles and right triangles.
4. Graph trigonometric functions and their inverses.
5. Solve problems using sum, difference, and multiple-angle formulas.
6. Prove trigonometric identities and solve trigonometric equations.
7. State the laws of sines and cosines and 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

The topics should be detailed enough to enable an instructor to determine the major areas that should be covered and so that the course may have consistency from instructor to instructor and semester to semester.

<table>
<thead>
<tr>
<th>Approximate Time in Hours</th>
<th>Major Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>I. FUNDAMENTALS OF TRIGONOMETRY</td>
</tr>
<tr>
<td>18</td>
<td>A. Radian and degree measure of angles</td>
</tr>
<tr>
<td></td>
<td>B. Trigonometric functions and the unit circle</td>
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<td></td>
<td>C. Reference angles</td>
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<td></td>
<td>D. Trigonometric functions and a right triangle</td>
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<td></td>
<td>E. Graphs of trigonometric functions</td>
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<td></td>
<td>F. Inverse trigonometric functions and their graphs</td>
</tr>
<tr>
<td>12</td>
<td>II. ANALYTIC TRIGONOMETRY</td>
</tr>
<tr>
<td>12</td>
<td>A. Trigonometric identities</td>
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<tr>
<td></td>
<td>B. Trigonometric equations</td>
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<td></td>
<td>C. Sum, difference, and multiple-angle formulas</td>
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<td></td>
<td>D. Laws of sines and cosines</td>
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<td>6</td>
<td>III. VECTORS</td>
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<td>6</td>
<td>A. Geometric and algebraic representations</td>
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<td>B. Addition, subtraction, and scalar multiplication</td>
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<td>12</td>
<td>IV. APPLICATIONS</td>
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<tr>
<td>12</td>
<td>A. Arc length</td>
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<td>B. Linear and angular speeds</td>
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<td></td>
<td>C. Elevation and depression</td>
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<td>D. Bearing and navigation</td>
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<td>6</td>
<td>V. COMPLEX NUMBERS</td>
</tr>
<tr>
<td>6</td>
<td>A. Standard form and trigonometric form</td>
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<td></td>
<td>B. Products and quotients</td>
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<td>54</td>
<td>TOTAL HOURS</td>
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</table>
IV. METHODS OF EVALUATION

A. CREDIT, DEGREE APPLICABLE AND CREDIT, NOT DEGREE APPLICABLE COURSES
Check the PRIMARY method of evaluation for this course.

- Substantial writing assignments
- Problem solving demonstrations (computational or non-computational)
- Skill demonstrations

A minimum of one response in 1, 2, or 3 below, as applicable, is required. However, you may check all that apply.

1. Indicate the types of writing assignments used as primary or secondary methods of evaluation for this course.
   - Essay exams
   - Written homework
   - Term or other papers
   - Reading reports
   - Laboratory reports
   - Other (specify)

2. Indicate the types of problem-solving demonstrations used as primary or secondary methods of evaluation for this course.
   - Exams
   - Laboratory reports
   - Quizzes
   - Homework problems
   - Fieldwork
   - Other (specify)

3. Indicate the types of skill demonstrations used as primary or secondary methods of evaluation for this course.
   - Class performance
   - Performance exams
   - Fieldwork
   - Other (specify)

4. If objective exams are also used, check all that apply.
   - Multiple choice
   - Completion
   - Matching items
   - True/false
   - Other (specify)

B. NON-CREDIT COURSE

Indicate the methods of evaluation that will be used to determine that the stated objectives have been met.
V. COURSEWORK

A. TYPICAL ASSIGNMENT

Provide an example of a typical assignment. This assignment must correspond to the PRIMARY method of evaluation indicated in Section IV, Methods of Evaluation. That is, it must be a writing assignment or, if more appropriate, an assignment involving problem solving or skill demonstration.

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

B. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS

Cite two specific assignments that demonstrate college-level critical thinking. (Required for degree applicable courses only.)

1. Verify the identity \[ \frac{1}{\cot(x)+1} + \frac{1}{\tan(x)+1} = 1. \]

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.

C. WORK OUTSIDE OF CLASS

Two hours of work outside of class are required for each hour of lecture or equivalent. Each student in this course will be required to participate in the following work outside of class time. Check all that apply.

- [x] Study
- [ ] Answer questions
- [ ] Skill practice
- [x] Required reading
- [x] Problem solving activity
- [ ] Written work (such as essay/composition/report/analysis/research)
- [ ] Journal (done on a continuing basis throughout the semester)
- [ ] Observation of or participation in an activity related to course content (such as theatre event, museum, concert, debate, meeting)
- [ ] Course is lab only - minimum required hours satisfied by scheduled lab time
- [ ] Other (specify)
VI. INSTRUCTIONAL METHODOLOGY

Check all planned instructional activities that apply:

- Lecture
- Lab
- Discussion
- Multimedia presentations
- Demonstration
- Group activities
- Role play/simulation
- Guest speakers
- Field trips
- Other (specify)

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, instructional delivery shall provide access, full inclusion, and effective communication for students with disabilities.
VII. TEXTS AND MATERIALS

If multiple selection is offered, only representative texts need be listed. An up-to-date list of required and recommended materials is maintained in the division office.

A. REQUIRED TEXTS (title, author, publisher, year)

B. REQUIRED SUPPLEMENTARY READINGS

C. OTHER REQUIRED MATERIALS
   Graphing or Scientific Calculator
VIII. CONDITIONS OF ENROLLMENT

If this course has a prerequisite or corequisite, complete section A. If this course has an Enrollment Limitation, complete section B.

A. PREREQUISITE AND/OR COREQUISITE

1. Indicate if this course has a prerequisite, corequisite, both, or none.
   - [ ] Prerequisite
   - [ ] Corequisite

2. Indicate Type. Check all that apply.
   - [ ] Sequential
   - [ ] Computational/Communication Skills
   - [ ] Health and Safety
   - [ ] Non-Course
   - [ ] Standard (If this is a Standard Prerequisite or Corequisite, attach CCC Form D.)

3. Entrance Skills/Knowledge

   List the required skills and/or knowledge without which a student would be highly unlikely to receive a grade of A, B, C, or Credit (or for Health and Safety, would endanger self or others) in this course.

   A. Use the properties of right triangles to solve problems. (Mathematics 60)
   B. Formulate and prove conjectures using deductive reasoning. (Mathematics 60)
   C. Solve any linear equation. (Mathematics 80)
   D. Solve any factorable or non-factorable quadratic equation. (Mathematics 80)

B. ENROLLMENT LIMITATION

1. Indicate the category which describes the Enrollment Limitation for this course.
   - [ ] Band/Orchestra
   - [ ] Theater
   - [ ] Speech
   - [ ] Chorus
   - [ ] Journalism
   - [ ] Dance
   - [ ] Intercollegiate Athletics
   - [ ] Honors Course
   - [ ] Blocks of Courses
   - [ ] Other (specify)

2. List Degree and/or Certificate requirements that are met by this course.

3. List all El Camino College courses that also satisfy the requirements listed above in section B.2.

Originator: Robert Horvath
Submittal Date: October, 1980