PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

PLANE TRIGONOMETRY
MTH 1000

Class Hours: 3.0 **Credit Hours: 3.0**

Laboratory Hours: 0.0 **Date Revised: Spring 99**

Catalog Course Description:

Plane trigonometry, with emphasis on identities and other analytical aspects used in calculus. This course is a prerequisite for MTH 1410 if high school trigonometry has not been completed.

Entry Level Standards:

Students must be able to read at the college level.

Prerequisites:

Two years of high school algebra and ACT math score of at least 19, or DSM 0840 or equivalent math placement score

Textbook(s) and Other Reference Materials Basic to the Course:

Textbook:
Larson, Hostetler, Edwards. *Trigonometry, A Graphing Approach With Technology Updates*. Houghton Mifflin Company, Boston, Massachusetts, 1997.
References:
Cohen, David. *Trigonometry*. West Publishing Company, 1992.
Personal Equipment:
Graphing calculator and graph paper. A symbolic manipulator such as the TI-89 or TI-92 is not permitted.

I. Week/Unit/Topic Basis:

Week	Topic
1	Introduction, review of algebra, graphing, and graphing calculators, Chapter 1; angle measurement, 2.1; trigonometric functions of angles, unit circle, 2.2
2	Trigonometric functions of an acute angle, trigonometric identities, right triangle applications, 2.3; trigonometric functions of all angles, 2.4
3	Graphs of sine and cosine functions, 2.5; graphs of the other four trigonometric functions, other trigonometric graphs, 2.6
4	Inverse trigonometric functions, 2.7; right triangle applications, other applications, 2.8
5	Review, Exam 1

6	Trigonometric identities and applications, 3.1; verifying identities, 3.2
7	Solving trigonometric equations, 3.3
8	Sum and difference formulas, 3.4; multiple angle formulas, half-angle formulas, 3.5
9	Review, Exam 2
10	Law of sines, area of triangles, 4.1; law of cosines, triangle area, 4.2
11	Vectors in the plane, vector operations, unit vectors, direction angles, vector applications, 4.3; dot product, angle between two vectors, applications, 4.4
12	Review, Exam 3
13	Complex numbers, operations with complex numbers, 5.1; trigonometric form of complex numbers, multiplication and division of complex numbers using trigonometric form, 5.3
14	Powers and roots of complex numbers, 5.4; polar coordinates, 7.7; graphs of polar equations, 7.8
15	Review; Exam 4; Review for final
16	Review; Final exam

II. Course Objectives*:

A. Master the trigonometric manipulative skills necessary for success in transfer programs. II, III

B. Use and interpret trigonometric functional notation and concepts. II, III, IV, V

C. Interpret trigonometric graphs. I, III, IV

D. Use the elementary trigonometric functions in solving right and oblique triangle problems. II, III, IV, V

E. Apply triangle laws to the solution of vector problems. II, III, V

F. Translate verbal situations into trigonometric equations by using appropriate problem solving techniques. II, III, IV

G. Use elementary trigonometric identities to solve equations. III, V

H. Master complex number arithmetic and equation solving. III, V

I. Learn to graph trigonometric functions that use polar coordinates. I, III

*Roman numerals after course objectives reference goals of the Mathematics department.

III. Instructional Processes*:

Students will:

1. Use algorithmic processes to solve problems from the physical world, using topics such as right triangle applications, graphs of sine and cosine functions, and the laws of sines and

cosines. *Problem Solving and Decision Making Outcome, Numerical Literacy Outcome, Active Learning Strategy*

2. Work, either individually or in a group setting, to demonstrate problem solving from an occupational field using trigonometry. Examples could include engineering students researching and solving problems involving real-world usage of complex (imaginary) numbers or physical science majors researching and solving vector problems using trigonometric functions. Solutions must be mathematically correct and be clear and correct in terms of the related occupational field. *Communication Outcome, Problem Solving and Decision Making Outcome, Numerical Literacy Outcome, Information Literacy Outcome, Transitional Strategy, Active Learning Strategy*

3. Use a graphing calculator to view and analyze trigonometric functions that, because of factors such as very large or very small numbers or numerically and algebraically challenging combinations of terms, would be very difficult or impossible to graph and understand without the technology. *Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome*

*Strategies and outcomes listed after instructional processes reference Pellissippi State□s goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should be able to:

1. Define and use the six trigonometric ratios. D

2. Apply the trigonometric ratios to right triangle problems from geometry and technology. D

3. Determine the trigonometric and inverse trigonometric functional values for any angle measured in degrees or radians. A, B, D

4. Apply radian measure to geometry and technology. E, F

5. Add vectors geometrically and algebraically. A, D, E

6. Use the law of sines and cosines to solve oblique triangles. A, E, F

7. Sketch sine and cosine graphs, noting the amplitude, period and horizontal displacement. A, C

8. Manipulate and convert between polar and rectangular forms of complex numbers. H

9. Prove trigonometric identities by using the fundamental, double-angle, sum, and difference identities. G

10. Solve conditional trigonometric equations by using identities. G

11. Learn the polar coordinate system and learn to draw polar graphs. I

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures:

Students are evaluated primarily on the basis of tests, quizzes, homework, and/or a comprehensive final exam. A minimum of 4 major tests (in addition to the final) is recommended.

B. Laboratory Expectations:

None

C. Field Work:

None

D. Other Evaluation Methods:

None

E. Grading Scale:

93 - 100	A
88 - 92	B+
83 - 87	B
78 - 82	C+
70 - 77	C
60 - 69	D
Below 60	F

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

B. Academic Dishonesty:

Individual instructors must distribute their policy on academic dishonesty during the first week of class.