PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

PRECALCULUS TRIGONOMETRY
MATH 1720

Class Hours: 3.0  Credit Hours: 3.0
Laboratory Hours: 0.0  Date Revised: Fall 2006

Catalog Course Description:

Precalculus Trigonometry for students in university parallel/transfer programs of science, mathematics, engineering, or computer science. This is one of two courses in a sequence which prepares students for Calculus I. It provides a review of plane trigonometry and other analytical aspects used in calculus. This course is a prerequisite for MATH 1910 if high school trigonometry has not been completed.

Entry Level Standards:

Students must be able to read at the college level.

Prerequisites:

High school algebra I and algebra II AND ACT math score of at least 19, or DSPM 0850 or equivalent math placement score.

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

Textbook:
References:

Personal Equipment:
A graphics calculator is required; the TI-83, TI-83 Plus, TI-84, or TI-84 Plus is recommended. A symbolic manipulator such as the TI-89 or TI-92 is not permitted.

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, review of functions, angles and radian measure; 4.1</td>
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<tr>
<td>2</td>
<td>Trigonometric functions: the unit circle, 4.2</td>
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<tr>
<td>3</td>
<td>Right triangle trigonometry, trigonometric functions of any angle; 4.3, 4.4</td>
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</tbody>
</table>
Review; Exam 1; graphs of sine and cosine functions; 4.5
Graphs of other trigonometric functions, inverse trigonometric functions; 4.6, 4.7
Applications of trigonometric functions; 4.8
Review; Exam 2; verifying trigonometric identities; 5.1
Sum and difference formulas; double angle, power reducing, and half-angle formulas; 5.2, 5.3
Trigonometric functions; 5.5
Review; Exam 3; law of sines; 6.1
Law of cosines, polar coordinates; 6.2, 6.3
Graphs of polar equations, complex numbers in polar form, Demoivre’s Theorem; 6.4, 6.5
Vectors, dot product; 6.6, 6.7
Review; Exam 4; review for Final Exam
Final Exam

II. Course Objectives*:

A. Master the trigonometric manipulative skills necessary for success in transfer programs. VI.1, 2
B. Use and interpret trigonometric functional notation and concepts. VI.1, 2
C. Interpret trigonometric graphs. VI.1, 2, 3, 4, 5, 6
D. Use the elementary trigonometric functions in solving right and oblique triangle problems. VI.1, 2, 3, 4
E. Apply triangle laws to the solution of vector problems. VI.1, 3, 4
F. Translate verbal situations into trigonometric equations by using appropriate problem solving techniques. VI.1, 2, 5
G. Use elementary trigonometric identities to solve equations. VI.1, 2, 5
H. Learn to graph trigonometric functions that use polar coordinates. VI.1, 5, 6

*Roman numerals after course objectives reference TBR’s general education goals.

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. *Transitional Strategy, Mathematics 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. *Transitional Strategy, Active Learning Strategy, Mathematics Outcome*

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. *Mathematics Outcome, Transitional Strategy, Technological 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. 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. H

*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:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>93 - 100</td>
<td>A</td>
</tr>
<tr>
<td>88 - 92</td>
<td>B+</td>
</tr>
<tr>
<td>83 - 87</td>
<td>B</td>
</tr>
<tr>
<td>78 - 82</td>
<td>C+</td>
</tr>
<tr>
<td>70 - 77</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
</tr>
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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:

Cheating, includes but is not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.

In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or zero for the assignment or (2) an F for the course.

C. Accommodations for Disabilities:

If you need accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Please see the instructor privately after class or in his/her
office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127 or 131 or by phone: 694-6751 (Voice/TTY) or 539-7153.

D. Other Policies:

Make Up Work:
Instructor discretion about make-up tests and/or assignments.

Cell Phones:
Cell phones are to be either turned off or put on vibration mode while in class. Instructor discretion as to penalty.

Posted: January 25, 2007