

**CENTRAL TEXAS COLLEGE
SYLLABUS FOR MATH 1316
TRIGONOMETRY**

Semester Hours Credit: 3

INSTRUCTOR: Mrs. Cabaniss & Mrs. Prescott

I. INTRODUCTION

Trigonometry is a study of very special functions and results are used to find solutions to many practical problems. At the same time, trigonometry lies at the center of a collection of mathematical tools, which are indispensable to any scientific endeavor. Trigonometry is the study of angles and triangles.

II. OVERALL OR GENERAL OBJECTIVES OF THE COURSE

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

- A. Define the six trigonometric functions in terms of the unit circle, a point on the terminal side of an angle, and right triangle relationships. (F8, F9)
- B. Find the function values of the trigonometric functions using definitions and a calculator. (F4, F8, F9)
- C. Work with degree and radian measure. (F4)
- D. Graph the six trigonometric functions and answer questions related to the graphs. (F8, F10)
- E. Solve problems involving the inverse trigonometric functions. (F9)
- F. Verify and apply trigonometric identities. (F8, F9)
- G. Solve trigonometric equations. (F4, F9)
- H. Derive and solve problems using the Law of Sines and the Law of Cosines. (F8, F9)
- I. Define and apply vectors. (F8, F9)
- J. Find the dot product of vectors. (F4, F9)
- K. Define and solve problems involving complex numbers. (F8, F9)
- L. Apply the trigonometric form of complex numbers. (F8, F9)
- M. Apply DeMoivre's Theorem. (F8, F9)
- N. Solve problems involving parametric equations. (F4, F9)
- O. Define and solve problems involving polar coordinates. (F4, F8, F9)

III. INSTRUCTIONAL MATERIALS

The Instructional materials identified for this course are viewable through http://www.ctcd.edu/im/im_main.asp

IV. COURSE REQUIREMENTS

- A. Students are expected to attend every class and to arrive at each class on time and remain in class for the entire class. Students who are absent from class 12.5% of the number of class meetings for any reason will be dropped from the class with a grade of "F".
- B. Assignments will be made daily. All assignments are to be completed by the following class meeting. Assignments may be collected and examined at any time.
- C. The instructor will post office hours after the semester commences. Consult the instructor during office hours. If your visit may tend to be lengthy, make an appointment with the instructor so that he/she may set aside some time for you.

V. EXAMINATIONS

- A. Examinations will be given at appropriate points during the semester. Each examination will be announced in class at least one week in advance. The number of examinations will be either four or five (counting the final) depending on the pace of the class and other unpredictable factors.
- B. Students who miss an exam should discuss with the instructor the circumstances surrounding the absence. The instructor will determine whether a make-up exam is to be given. Make-up examinations are given by appointment only.

VI. SEMESTER GRADE COMPUTATIONS

- A. Your point total is determined by adding the points earned on each unit examination. Your letter grade for the course is then determined by the following formula:

$$\frac{\text{Your Point Total}}{\text{Total Points Possible}} \times 100$$

If the result is between 90 and 100, your grade is a (n)	A
80 and 89	B
70 and 79	C
60 and 69	D
0 and 59	F

** NOTE: Grade Computation is determined by instructor. Please see your instructor for how your grade will be determined. This is just an example.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR

- A. Withdrawal from Course: It is the student's responsibility to officially drop a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or an Application for Refund. The withdrawal form must be signed by the student.

Application for Withdrawal will be accepted at any time prior to Friday of the 12th week of classes during the 16 week fall and spring semesters. The deadline for sessions of other lengths is as follows.

Friday of 3rd week for 5-week courses
Friday of 4th week for 6-week courses
Friday of 6th week for 8-week courses
Friday of 7th week for 10-week courses
Friday of 9th week for 12-week courses
Friday of 12th week for 16-week courses

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of "W", provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

- B. An Administrative Withdrawal: An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the registrar.
- C. An Incomplete Grade: The College catalog states, "An incomplete grade may be given in those cases where the student has completed the majority of the course work, but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course..." Prior approval from the instructor is required before the grade of "I" is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.
- D. The use of cellular phones/beepers will not be tolerated in class.

- E. Students are expected at all times to conduct themselves in a manner that is supportive to classroom activities. Each instructor may have additional instructions regarding classroom requirements.
- F. The Math Department operates an Advanced Mathematics Lab in Building 152, Room 145. All courses offered by the Math Department are supported in the lab with appropriate tutorial software. Walk-in tutoring is also available in Building 152, Room 236. Calculators and Graphlink are available for student use in the lab. Students are encouraged to take advantage of these opportunities. See posted hours for the Walk-in tutoring and Math Lab.

VIII. COURSE OUTLINE

- A. **Unit One:** The Trigonometric Functions, Acute Angles, and Right Triangles (Chapters 1 & 2)
 - 1. **Unit Objectives:** Upon successful completion of this unit, the student will be able to:
 - a. Discuss and apply the concept of angle.
 - b. Define and apply the six trigonometric functions based on angles.
 - c. Define and apply the six trigonometric functions of acute angles.
 - d. Define and apply reference angles and co-terminal angles.
 - e. Find trigonometric function values using a calculator.
 - f. Find trigonometric functions values: exact and approximate.
 - g. Solve right triangles.
 - 2. **Learning Activities:**
 - a. Read chapters 1&2
 - b. Work problems assigned by instructor.
 - c. Complete lab exercises assigned by the instructor.
 - 3. **Unit Outline:**
 - a. Section 1.1 Angles
 - b. Section 1.2 Angle Relationships and Similar Triangles
 - c. Section 1.3 Trigonometric Functions
 - d. Section 1.4 Using the Definitions of the Trigonometric Functions
 - e. Section 2.1 Trigonometric Functions of Acute Angles
 - f. Section 2.2 Trigonometric Functions of Non-Acute Angles
 - g. Section 2.3 Finding Trigonometric Function Values Using a Calculator.
 - h. Section 2.4 Solving Right Triangles
 - i. Section 2.5 Further Applications of Right Triangles
- B. **Unit Two:** Radian Measure, Circular Functions, and Graphs of the Circular Functions inverse functions. (Chapters 3 & 4)

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Define and apply radian measure.
 - b. Define and apply circular functions of real numbers.
 - c. Solve problems involving linear and angular velocity.
 - d. Graph the circular functions.
 - e. Define and Graph Inverse Functions
 - f. Evaluate Inverse Functions

2. Learning Activities:
 - a. Read Chapters 3 & 4
 - b. Work problems assigned by the instructor.
 - c. Complete assigned lab exercises.

3. Unit Outline:
 - a. Section 3.1 Radian Measure
 - b. Section 3.2 Applications of Radian Measure
 - c. Section 3.3 The Unit Circle and Circular Functions
 - d. Section 3.4 Linear and Angular Speed
 - e. Section 4.1 Graphs of the Sine and Cosine Functions
 - f. Section 4.2 Translations of the Graphs of the Sine and Cosine Functions
 - g. Section 4.3 Graphs of the Other Circular Functions
 - h. Section 4.4 Harmonic Motion

C. **Unit Three:** Trigonometric Identities (Chapter 5)

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Derive and apply the fundamental identities.
 - b. Verify trigonometric identities.
 - c. Derive and apply the sum for cosine.
 - d. Derive and apply the sum and difference identities for sine and tangent.
 - e. Derive and apply the double-angle identities.
 - f. Derive and apply the half-angle identities.
 - g. Derive and apply additional identities

2. Learning Activities:
 - a. Read Chapter 5
 - b. Work problems assigned by the instructor
 - c. Complete assigned lab exercises

3. Unit Outline:
 - a. Section 5.1 Fundamental Identities
 - b. Section 5.2 Verifying Trigonometric Identities
 - c. Section 5.3 Sum and Difference Identities for Cosine
 - d. Section 5.4 Sum and Difference Identities for Sine and Tangent
 - e. Section 5.5 Double-Angle Identities
 - f. Section 5.6 Half-Angle Identities

D. **Unit Four:** Triangles (Chapters 6 & 7)

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Derive and Use the Law of Sines
 - b. Solve problems involving the Ambiguous Case
 - c. Derive and use the Law of Cosines
 - d. Compute the Area of a Triangle
 - e. Solve problems involving Vectors
 - f. Solve problems involving the dot product of vectors.
2. Learning Activities:
 - a. Read Chapters 6 & 7
 - b. Work problem assigned by the instructor.
 - c. Complete Assigned Lab Exercises
3. Unit Outline:
 - a. Section 6.1 Inverse Circular Functions
 - b. Section 6.2 Trigonometric Equations I
 - c. Section 6.3 Trigonometric Equations II
 - d. Section 6.4 Equations Involving Inverse Trigonometric Functions
 - e. Section 7.1 Oblique Triangles and the Law of Sines
 - f. Section 7.2 The Ambiguous Case of the Law Sines
 - g. Section 7.3 The Law of Cosines
 - h. Section 7.4 Vectors, Operations, and the Dot Product
 - i. Section 7.5 Applications of Vectors

E. **Unit Five**: Complex Numbers, Polar Equations, and Parametric Equations (Chapters 8)

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Define and solve problems involving complex numbers
 - b. Define and solve problems involving Trigonometric form of Complex Numbers.
 - c. Find Products and Quotients in Trigonometric Form.
 - d. Find Roots of a Complex Number
 - e. Define and Solve problems involving Polar Coordinates
 - f. Solve Polar Equations
 - g. Graph Polar Equations

2. Learning Activities:
 - a. Read Chapter 8
 - b. Work Problems assigned by the instructor
 - c. Complete assigned lab exercises

3. Unit Outline:
 - a. Section 8.1 Complex Numbers
 - b. Section 8.2 Trigonometric (Polar) Form of Complex Numbers
 - c. Section 8.3 The Product and Quotient Theorems
 - d. Section 8.4 De Moivre's Theorem: Powers and Roots of Complex Numbers
 - e. Section 8.5 Polar Equations and Graphs
 - f. Section 8.6 Parametric Equations, Graphs, and Applications