

**COLLIN COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS**

COURSE NUMBER: Math 1316

COURSE TITLE: Trigonometry

CREDIT HRS: 3 **LECTURE HRS:** 3 **LAB HRS:** 0 **CLN/REC HRS:** 0

ASSESSMENTS:

Prior to enrolling in this course, the student must demonstrate eligibility to enroll in the following: MATH 1316, MATH 1325, MATH 1350, or MATH 2373.

PREREQUISITE: MATH 1314 or MATH 1414 or TSI placement.

COREQUISITE: None

TEXTBOOK:

Onsite courses: Trigonometry, Cynthia Y. Young, Wiley, ©2007

Online courses: e-mail your professor, cjohnson@ccccd.edu, for textbook information.

SUPPLIES: Graphing calculator required.

COURSE DESCRIPTION:

Angular measure, functions of angles, identities, solution of triangles, equations, inverse trigonometric functions, complex numbers, and polar coordinates.

COURSE MEASURABLE LEARNING OUTCOMES:

Upon completion of this course the students should be able to do the following:

1. Use trigonometric functions to prove identities and solve conditional equations
2. Graph the six basic trigonometric functions and variations on them.
3. Solve for the measures of the sides and angles in a right triangle
4. Use vectors and complex numbers as well as polar coordinates
5. Solve general triangles using the Law of Sines and the Law of Cosines
6. Find areas of triangles using their angles and sides
7. Understand and solve application problems using both geometric and algebraic vectors
8. Use trigonometric techniques to solve problems from physics and engineering.

COURSE REQUIREMENTS:

Attending lectures, completing required exams, quizzes, and assignments. Graphing calculators are used in lieu of trig tables.

COURSE FORMAT:

Lecture and guided practice

METHOD OF EVALUATION:

A minimum of four written exams and a comprehensive final exam. Homework and/or quizzes may be used in place of one exam or in addition to exams. The weight of each of these components of evaluation will be specified in the individual instructor's addendum to this syllabus. All out-of-class course credit, including take-home exams, home assignments, service-learning, etc. may not exceed 25% of the total course grade; thus, at least 75% of a student's grade must consist of exams given in the class or testing center, and no student may retake any of these exams.

ATTENDANCE POLICY:

Attendance is expected of all students. If a student is unable to attend, it is his/her responsibility to contact the instructor to obtain assignments. Please see the schedule of classes for the last day to withdraw.

Religious Holy Days: In accordance with section 51.911 of the Texas Education Code, the college will allow a student who is absent from class for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within a reasonable time. A copy of the state rules and procedures regarding holy days and the form for notification of absence from each class under this provision are available from the Admissions and Records Office.

COURSE REPEAT POLICY:

All students may repeat this course only once after receiving a grade, including W. For example students who have taken this course twice have to choose a different course to take after two trials.

ADA STATEMENT:

It is the policy of Collin County Community College to provide reasonable and appropriate accommodations for individuals with documented disabilities. This College will adhere to all applicable Federal and State laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to contact the ACCESS Office (G-200) or 972.881.5898, (TDD 972.881.5950) in a timely manner if he/she desires to arrange for accommodations.

RELIGIOUS HOLY DAYS:

In accordance with section 51.911 of the Texas Education Code, the college will allow a student who is absent from class for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within a reasonable time. A copy of the state rules and procedures regarding holy days and the form for notification of absence from each class under this

provision are available from the Admissions and Records Office.

ACADEMIC ETHICS:

The college may initiate disciplinary proceedings against a student accused of scholastic dishonesty. Scholastic dishonesty includes, but is not limited to, statements, acts, or omissions related to applications for enrollment or the award of a degree, and/or the submission of material as one's own work that is not one's own. Scholastic dishonesty may involve one or more of the following acts: cheating, plagiarism, collusion, use of annotated texts or teacher's editions, and/or falsifying academic records.

Cheating is the willful giving or receiving of information in an unauthorized manner during an examination, illicitly obtaining examination questions in advance, using someone else's work for assignments as if it were one's own, copying computer or Internet files, and any other dishonest means of attempting to fulfill the requirements of a course.

Plagiarism is the use of an author's words or ideas as if they were one's own without giving credit to the source, including, but not limited to, failure to acknowledge a direct quotation.

Collusion is intentionally or unintentionally aiding or attempting to aid another in an act of academic dishonesty, including but not limited to, failing to secure academic work; providing a paper or project to another student; providing an inappropriate level of assistance; communicating answers to a classmate about an examination or any other course assignment; removing tests or answer sheets from a test site; and allowing a classmate to copy answers.

Contact the Dean of Students at 972.881.5771 for the student disciplinary process and procedures or consult the CCCCD Student Handbook, section 7-2.3.

SPECIFIC REQUIREMENTS/COURSE CONTENT:

MODULE 1: Right Triangle Trigonometry and Trigonometric Functions

The student will be able to:

1. Classify angles as right, acute, or obtuse.
2. Understand degree measure of an angle.
3. Use the Pythagorean Theorem for right triangles.
4. Solve special right triangles.
5. Use similar triangles and understand the difference between congruent and similar triangles.
6. Use the definition of the trigonometric functions as ratios of sides of a right triangle.
7. Use the Cofunction Theorem and the cofunction identities.
8. Evaluate trigonometric functions exactly for special values and approximately with a calculator.
9. Use decimal degrees and degrees, minutes, and seconds for angles.
10. Solve right triangles, using the correct significant digits for sides and angles.
11. Plot angles in standard position and identify coterminal angles.
12. Graph common angles.
13. Calculate trigonometric functions for acute, non-acute, and quadrantal angles.
14. Use reference angles to evaluate trigonometric functions for any angle.
15. Learn the basic trigonometric identities and use them to find trigonometric function values and

simplify expressions.

MODULE 2: Radian Measure, the Unit Circle, and Graphing Trigonometric Functions

The student will be able to:

1. Calculate radian measure and convert between degrees and radians.
2. Calculate trigonometric function values for angles given in radians.
3. Calculate the arc length of a circle, the area of a circular sector, and solve applied problems involving them.
4. Calculate angular and linear speed and solve applied problems involving them.
5. Use the unit circle to define and evaluate trigonometric functions.
6. Know the domains and ranges of the six circular functions and which are even or odd.
7. Graph sine and cosine functions, determining their domain, range, amplitude, and period.
8. Graph reflections and horizontal and vertical translations of sine and cosine functions, and calculate the amplitude, period, and phase shift.
9. Find sinusoidal functions from data.
10. Graph basic tangent, cotangent, secant, and cosecant functions and know their periods.
11. Use translations to graph general tangent, cotangent, secant, and cosecant functions.

MODULE 3: Trigonometric Identities and Solving Trigonometric Equations

The student will be able to:

1. Use basic trigonometric identities to simplify expressions and verify identities.
2. Know the sum and difference identities and use them to find exact values and develop new identities.
3. Know the double-angle identities and use them to find exact values and develop new identities.
4. Know the half-angle identities and use them to find exact values and verify other identities.
5. Know the inverse trigonometric functions, find their values, and graph these functions.
6. Solve trigonometric equations involving only one trigonometric function.
7. Solve trigonometric equations that involve multiple trigonometric functions.

MODULE 4: Applications of Trigonometry – Triangles and Vectors, Complex Numbers, Polar Coordinates, and Parametric Equations

The student will be able to:

1. Use the Law of Sines to solve AAS or ASA triangles and ambiguous SSA triangles and applications involving such triangles.
2. Use the Law of Cosines to solve SAS and SSS triangles and applications involving such triangles.
3. Find the area of a triangle in the SAS and SSS cases.
4. Understand vectors and be able to represent them both geometrically and algebraically.
5. Find the magnitude and direction of a vector.
6. Add, subtract, and perform scalar multiplication of vectors.
7. Find unit vectors and express a vector in terms of its horizontal and vertical components.
8. Find the dot product and use it to find the angle between two vectors, determine if two vectors are parallel or perpendicular, and calculate work.
9. (Optional) Add, subtract, multiply, and divide complex numbers, and use complex numbers to

solve quadratic equations.

10. Graph complex numbers in the complex plane.
11. Know the polar form of a complex number and convert between polar and rectangular forms.
12. Find the product and quotient of two complex numbers in polar form and find powers and roots of complex numbers.
13. Plot points in polar coordinates.
14. Convert points and equations between polar form and rectangular form and graph polar equations.
15. Graph parametric equations.
16. Eliminate the parameter.
17. Find parametric equations for a graph defined by an equation in rectangular form.