College of Dupage
Math 1432-NET01: Precalculus II: Trigonometry
Tuesday, Thursday 1:00 – 3:50 PM
BIC 1429

Contact Information:

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Course Objectives and Topic Outline:

Course description to appear in catalog: Students will learn trigonometry with an emphasis on concepts needed for calculus. Topics include, but are not limited to, formal definition of trigonometric functions and circular functions, radian measure, inverse trigonometric functions, graphs of trigonometric functions and inverse trigonometric functions, trigonometric identities, trigonometric equations, DeMoivre's theorem, solution of triangles, polar coordinates, and applications.
Credit Hours: 3 Lecture Hours: 3 Lab Hours: 0
Prerequisite: MATH 1431 Precalculus I with a grade of "C" or better, or equivalent or a qualifying score on the mathematics placement test

A. General Course Objectives:
Upon successful completion of the course the student should be able to do the following:

1. Define the six trigonometric functions as ratios in right triangles as well as within the unit circle
2. Demonstrate the use of standard position, as well as coterminal and reference angles
3. Perform degree-to-radian and radian-to-degree conversions with and without a calculator
4. Use trigonometry to solve applications involving any type of triangle
5. Demonstrate the ability to state and use the fundamental identities (reciprocal, Pythagorean, quotient, and negative angles) from memory
6. Determine the values of the trigonometric functions at quadrantal and special angles without the use of a calculator
7. Use a calculator to find trigonometric values and inverse trigonometric values
8. Construct the graphs of the six trigonometric functions without a calculator
9. Identify amplitude, period, and horizontal and vertical translations of graphs with and without a calculator
10. Deduce limits of trigonometric functions from their graphs
11. Calculate angular and linear velocity for circular motion and apply these calculations to applications
12. Calculate the area of a sector and arc length and apply these calculations to applications
13. Demonstrate the ability to algebraically manipulate expressions containing trigonometric functions
14. Demonstrate the ability to verify identities formally
15. Demonstrate the ability to state and use the cofunction identities as well as the sum and difference of angles identities for sine, cosine, and tangent from memory
16. Use the sum-to-product and product-to-sum identities
17. Solve trigonometric equations
18. Construct the graphs of the inverse trigonometric functions
19. Compute the values of inverse trigonometric functions and algebraic expressions involving inverse trigonometric functions without a calculator
20. Apply the law of sines and the law of cosines

21. Calculate the area of any triangle
22. Perform operations with vectors to include finding magnitude and direction as well as solving applications
23. Convert complex numbers between standard and trigonometric form
24. Use the trigonometric form to perform multiplication and division and to find powers and roots of complex numbers
25. Convert ordered pairs between rectangular and polar form
26. Construct the graphs of polar equations

B. Topical Outline:

1. Trigonometric functions
    1. Rectangular coordinate system, distance, and functions
    2. Angles
    3. Definitions of the trigonometric functions
2. Acute angle
    1. Trigonometric functions of an acute angle
    2. Cofunctions
    3. Trigonometric values of 30^{o}, 45^{o}, 60^{o} and 90^{o} without the use of a calculator
    4. Right triangles
    5. Applications
3. Fundamental identities
    1. Reciprocal, cofunction, opposite angle, Pythagorean, and quotient identities (to be memorized)
    2. Trigonometric expressions
    3. Verification of identities
4. Related angles and radian measure
    1. Related angles
    2. Reduction to an acute angle
    3. Radian measure
    4. Conversion between degrees and radians (with and without the use of a calculator)
    5. Arc length, area of a sector, linear and angular velocity
    6. Trigonometric functions of real numbers
5. Graphs of the trigonometric functions
    1. Periodic functions
    2. Amplitude, period, vertical translations, and phase shifts without a calculator
    3. Graphs by addition of ordinates (optional)
    4. Graphs involving algebraic operations (optional)
6. Trigonometric identities
    1. Sum and difference identities (to be memorized)
    2. Half and double-angle identities (to be memorized)
    3. Verification of identities
    4. Product-to-sum and sum-to-product identities
    5. Reduction formula (optional)
7. Trigonometric equations
    1. Basic trigonometric equations
    2. Equations with multiple and fractional arguments
    3. Equations using identities
8. Inverse trigonometric relations and functions
    1. Inverse trigonometric relations
    2. Inverse trigonometric functions
    3. Graphs of inverse trigonometric relations and functions

    4. Operations with inverse trigonometric functions
    5. Equations with inverse trigonometric functions
9. Triangles, vectors, and applications
    1. Law of sines
    2. Law of cosines
    3. Oblique triangles
    4. Area formulas
    5. Vectors: components and resultants
    6. Applications
10. Complex numbers
    1. Complex number arithmetic review (optional)
    2. Graphical representation
    3. Graphical addition
    4. Multiplication and division in trigonometric form
    5. DeMoivre's theorem
11. Polar coordinates
    1. Conversion between polar and rectangular coordinates
    2. Graphs of polar equations
12. Limits involving trigonometric functions (optional)

Course Materials:

- *Trigonometry*, 12th ed., by Lial, Hornsby, Schneider, Daniels

Classtime:

Students are expected to attend class and PARTICIPATE. Students are responsible for all material covered in each class, even if they missed that day. Exams will be held during class time.

While in class, students should be respectful of other students as well as the instructor. All students are welcome to share their thoughts and the classroom will be an inclusive space.

Students should not distract others with their computers or cell phones. Any distractible cell phone use should be done outside the classroom. All communication between instructor and students will be conducted either through Blackboard or via a COD email account. Make sure you check your COD email regularly.

Homework:

Homework will be assigned for every lecture out of the textbook. Students need to spend time and attempt every assigned homework problem to master the material and be prepared for quizzes and exams.

Solution guides and online step-by-step solutions should not be overused when doing homework. Students who rely on these resources are not self-sufficient and will underperform on exams. When

stuck on a problem, take the time to read class notes and the textbook for related examples. Set aside time for contacting the instructor or the Math Assistance Area for help.

Homework is due within the first 5 minutes of class. Late penalties or 0's may be given if homework is turned in late without a free pass. All homework due dates are shown on the course calendar.

Most quiz and exam problem are either homework problems or are questions inspired by the homework.

The lowest four homework grades will be dropped before computing the Homework Average in the final grade. All homework assignments will count equally when computing the homework average.

Quizzes:

Quizzes will be taken in class and will be a check on how well students understand the material without using outside resources.

Calculators are not allowed during quizzes unless students are instructed otherwise. Quizzes in general are easier than exams with regards to the complexity or length of the questions asked.

In-class quizzes will be timed.

The lowest quiz will be dropped before computing the quiz average in the final grade. All quizzes will be weighted equally when computing the quiz average.

"Free Passes":

Each student is allowed three "free passes" for the semester, good for a 48-hour extension on any assignment. *No more than one* of these passes may be used on a unit exam, and a free pass cannot be used on assignments due in the final week of the semester..

The 48-hour extension begins from the original deadline of the assignment, and students must complete the form found in Blackboard *before* the original deadline or quiz/exam start time.

All exams or in-class quizzes must be taken in a COD Testing Center or using the Virtual Testing Center. There are no extensions after the 48 hours, even if the Testing Center has limited hours during that time. Always check the COD Testing Center hours and locations before going in to make up a quiz or exam.

Exams:

There will be two (2) midterms and a cumulative final exam given in the course in class.

Scratch work will be graded on exams, and correct work will be awarded partial credit even if the final answer is not correct.

The cumulative final exam will take place on the last day of class, as shown on the calendar. The final exam grade will replace the lowest unit exam grade if that helps a student's final grade in the course.

Attendance Policy:

Students are expected to attend every class and to understand material for classes they miss. See the Quiz Extensions section for the policy regarding late work for quizzes.

The exam dates are all posted on the calendar. If a student knows in advance they will not be in class that day, they must plan to take the exam on an earlier day in a COD Testing Center. These situations are planned on an individual basis and the instructor should be notified at least two days in advance. Any exam missed without consulting the instructor beforehand will receive 0 points.

Neither quizzes nor exams can be made up after their due date under any circumstances except as an accommodation required by the Center for Access and Accommodations or as one of the free passes requested using the online form.

Grade Calculation:

Graded Assessment	Percentage of Final Grade
Homework (lowest 4 dropped)	15%
Quizzes (lowest dropped)	20%
Two Unit Exams	20% Each
Cumulative Final Exam (replaces lowest unit exam)	25%

Letter Grade	A	B	C	D	F
Percentage	89.5% and Up	79.5% - 89.5%	69.5% - 79.5%	60% - 69.5%	Below 60%

Written Style:

Student should practice and use good style when answering problems to receive any partial credit. If a student writes down a correct answer without sufficient work, they will receive no credit and may have to defend the academic integrity of their submission.

Any answer which requires an explanation should be written in complete sentences, all mathematical notation should be consistent and make sense, and anybody reading the solutions for the first time (namely, the grader) should have no confusion as to both the final answer and the work involved to get there.

Sloppy writing gets no credit. Instructors are not mind-readers, and only the written work will be graded for completeness and accuracy.

Academic Integrity:

Students should be aware of the Code of Academic Conduct and know the consequences should the code be violated. The document can be found at

Code of Academic Conduct

If a student is caught violating the Code they will receive a grade penalty and will be reported through COD's academic integrity reporting system.

Student academic dishonesty includes but is not limited to:

· Dishonest use of course materials, such as student papers, examinations, reports and material posted on the Internet.

· Knowingly posting course materials of any kind on Internet sites such as (but not limited to) Course Hero and Chegg without the consent of the instructor.

· Knowingly assisting others in the dishonest use of course materials such as student papers, examinations and reports.

· Knowingly providing course materials such as papers, lab data, reports and/or electronic files to be used by another student as that student's own work.

· Plagiarizing, i.e., using language or ideas from materials without acknowledgement and/or copying work from other sources and submitting it as one's own.

· Examples of plagiarism include but are not limited to:

§ Copying a phrase, a sentence, or a longer passage from a source (including an Internet source) and submitting it as one's own.

§ Summarizing or paraphrasing someone else's ideas without acknowledging the source.

§ Submitting group assignments individually as one's own independent work.

§ Copying or taking pictures of course materials such as videos, exams, quizzes or assignments and posting the copied items and/or pictures on the Internet **or** sharing these copied items and/or pictures with other students who have not yet completed the assignments.

§ Taking pictures or copying course materials that are considered confidential by the instructor such as exams or quizzes.

If an exam is being proctored, students should comply with the proctor's instructions. If a proctor accuses a student of violating the Code of Academic Conduct or not conforming to the assessment's instructions, and the student does not agree with the accusation, the student should provide countervailing evidence to support their case. Students caught violating the Code of Academic Conduct will receive a 0 on that assignment and possibly further penalties depending on the nature of the violation.

Center for Access and Accommodations:

The College of DuPage is committed to the equitable access of educational opportunities for students with disabilities in accordance with The Americans with Disabilities Act, As Amended and Section 504 of the Rehabilitation Act of 1973. Any student who feels they may need an accommodation on the basis of an illness, injury, medical condition, or disability should contact the Center for Access and Accommodations to determine eligibility for accommodations and to obtain an official Letter of Accommodation. The Center for Access and Accommodations can be reached via email at access@cod.edu. Students may also initiate a request for services by going to www.cod.edu/access and

clicking on the green box labeled “complete form to request accommodations.” If you are already registered with the Center for Access and Accommodations, please email me your Letter of Accommodation as soon as possible. Please DO NOT send any private health documentation or Doctor’s notes to the course instructor.

Withdrawal Policy:

The final day for a student to withdraw from any course will be equal to 75% of the time for the respective academic session (see the Registration Calendar) through myACCESS https://myaccess.cod.edu or in person at the Registration office, Student Services Center (SSC), Room 2221.

After the deadline, students will be required to appeal for late withdrawal and provide appropriate documentation to the Student Registration Services Office for all requests. Students who are granted approval to withdraw by petition will not be eligible for refunds of tuition or fees and will receive a 'W' grade on their transcript. Appeals must be submitted prior to the designated final exam period for 16-week classes and before the last class meeting for all other session classes