Quinsigamond Community College School of Math, Science, & Engineering

Instructor's Information

Instructor: Professor XX (she/her/hers)
Office: 200A
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Course Information

Course: MAT 124 College Mathematics II: Trigonometry – Section XX
Meets: Mondays and Wednesdays from 11:00am – 12:15pm
Room: 177A
Credits: 3 credits
Semester: Fall 2024

Course Description

Students solve right and oblique triangles and related applications; perform vector computations and use vector concepts to solve applications; determine the values of trigonometric ratios of angles and the values of inverse trigonometric ratios of real numbers; work with angles measured in degrees-minutes-seconds or radians; solve uniform circular motion problems; learn the traditional trigonometric identities and use them to prove other identities; perform transformations of basic trigonometric graphs; write equations to describe specific instances of harmonic motion; and solve trigonometric equations.

Prerequisites

MAT 123 Pre-Calculus or appropriate placement score

Required Textbook/Materials/Website

Textbook: *Algebra and Trigonometry*, by Blitzer, 7th edition, Pearson © 2022
Materials: Graphing calculator (recommended)
Website: Required access to www.mymathlab.com

Student Learning Outcomes

Upon completion of this course, students will be able to:

1. Evaluate and graph the six trigonometric functions, their transformations, and their inverse trigonometric functions.
2. Verify trigonometric identities and solve trigonometric equations.
3. Apply the laws of Sine and Cosine to solve right and oblique triangles.
4. Perform operations with vectors such as addition, scalar multiplication, dot product.
5. Set up and solve applied problems.

Course Topics & Required Section Readings/Assignments

Trigonometric Functions

- Angles and Radian measure
- Right Triangle Trigonometry
- Trigonometric Functions of any angle
- Trigonometric Functions of real numbers; Periodic Functions
- Graphs of Sine and Cosine Functions
- Graphs of other trigonometric functions
- Inverse Trigonometric Functions
- Applications of Trigonometric Functions

Analytic Trigonometry

- Verifying Trigonometric Identities
- Sum and Difference Formulas
- Double-Angle, Power Reducing, and Half Angle Formulas
- Product-to-Sum and Sum-to-Product Formulas
- Trigonometric Equations

Additional Topics in Trigonometry

- The Law of Sines
- The Law of Cosines
- Polar Coordinates
- Graphs of Polar Equations
- Vectors
- The Dot Product

Instructional Objectives

- Use the vocabulary of angles.
- Use degree and radian measure.
- Convert between degrees and radian measures.
- Draw and label the entire key values on a unit circle, both in degrees and radians.
- Draw angles in standard position.
- Find coterminal angles.
- Find the arclength on a unit circle.
- Use linear and angular speed in applications.
- Use a unit circle to define the 6 trigonometric functions, to find domain and range, and determine which of the functions are odd or even.
- Recognize and use the fundamental identities.
- Evaluate trigonometric functions with and without a calculator.
- Use right triangles to evaluate trigonometric functions.
- Find and use cofunctions.
- Use right triangle trigonometry to solve applied problems.
- Use the signs of trigonometry functions (All Students Take Calculus).
- Find and use reference angles.

- Graph the 6 parent trigonometric functions along with their shifts and transformations.
- Find inverse trigonometric functions.
- Evaluate inverse trigonometric functions with a calculator.
- Find exact values of composite functions with inverse trigonometric functions.
- Apply models (such as right triangles using inverse functions, bearings, and/or simple harmonic motion).
- Use the fundamental trigonometric identities to verify identities.
- Use the formulae for the cosine, sine, and tangent of the sum and difference of two angles.
- Use the double-angle, power-reducing, and half-angle formulae.
- Use the product-to-sum, and sum-to-product formulae.
- To be able to find all solutions of a trigonometric equation.
- Solve equations with multiple angles.
- Solve trigonometric equations quadratic in form.
- Use factoring to separate different functions in trigonometric equations.
- Use identities to solve trigonometric equations.
- Use a calculator to solve trigonometric equations.
- Use the Law of Sines and Law of Cosines to solve oblique problems.
- Use the Law of Sines to find and solve the ambiguous case.
- Apply models using the Law of Sines and Law of Cosines.
- Use magnitude and direction to show vectors are equal.
- Understand scalar multiplication, vector addition/subtraction as geometric vectors.
- Represent vectors in the rectangular coordinate system.
- Perform operations with vectors in terms of **i** and **j**.
- Find the unit vector in the direction of **v**.
- Write a vector in terms of its magnitude and direction.
- Solve applied problems involving vectors.

Grading Breakdown

20% Homework
10% Quizzes
10% <Attendance or Project & Presentation>
35% Exams
25% Comprehensive Final Exam

Grade	Range	Grade	Range	Grade	Range
A	95 – 100	B –	80 – 82	D +	67 – 69
A –	90 – 94	C +	77 – 79	D	63 – 66
B +	87 – 89	C	73 – 76	D –	60 – 62
B	83 – 86	C –	70 – 72	F	0 – 59

Teaching Procedures

Most classes will be a combination of lectures, group activities, and in-class assignments. You will be given homework assignments to be completed outside of class. Occasionally, a quiz or exam will be given in class.

Attendance Policy

Students are expected to attend all classes for the entire period. Attendance will be taken in every class. If you are absent from class, proper documentation will excuse your absence.

Diversity, Equity, and Inclusion Statement for the School of Math & Science

The School of Math and Science is motivated to teach and learn from the diverse community we have at QCC. In Science, Technology, Engineering, and Mathematics (STEM), it is advantageous to approach problems from multiple perspectives. The power of diversity, equity and inclusion allows us to persevere and overcome challenges.

The faculty of the School of Math and Science pledge to help students meet the demands of STEM regardless of race/ethnicity, gender identity and expression, sexual orientation, faith, abilities/disabilities, age, socioeconomic background, political leaning, ancestry, national origin, home language and all other identities. We are dedicated to nurturing a culture of collaboration, mutual respect and understanding; and to empowering members of our community to embrace their full potential.

Accessibility Statement

Quinsigamond Community College is committed to providing access and inclusion for all persons with disabilities. Students who require an accommodation in this course should notify the professor as soon as possible. Students are responsible for forwarding the Accommodation Letter to the professor (via email or hard copy). Students may request accommodations at any time during the semester, which begin upon receipt (accommodations are not retroactive). Please discuss any barriers which may arise during the semester with your professor or coordinator in the Student Accessibility Services office.

Contact Information for Student Accessibility Services (SAS):
Call: 508-854-4471
Sorenson Video Phone: 508-502-7647
Email: disabilityservices@qcc.mass.edu

Services for Veterans

If you are a veteran of the US Armed Forces, please visit the Veteran Affairs Office located in 258A (Administration Building) or contact them at veteranaffairs@qcc.mass.edu.

Academic Honesty and Plagiarism

Our purpose of education is to seek the truth; this work requires trust and honesty between teacher and student. If we are not honest about what we know and don't know, our learning will always be impaired. Because our teaching and learning depends on this honest communication, we expect all students to understand what plagiarism is and why it is unacceptable.

Plagiarism means taking someone else's ideas or words and presenting them as one's own. The offense can take many forms including cheating on a test, passing in a paper taken from the Internet or from another student, or failing to properly use and credit sources in an essay. Sometimes the issue is

subtle, involving getting too much help on an assignment from someone else. In every instance, plagiarism means cheating both oneself and the owner of the source. Since cheating sabotages a student's learning experience, consequences range from no credit for the assignment to failure for the course and possible expulsion from the college.

The penalty for getting caught cheating in this course is a failure of the quiz or test, or failure of the entire course. This is solely at the discretion of the instructor.

For further information concerning plagiarism, refer to the QCC Student Handbook.

Math Center & QCC Math YouTube Channel

The Math Center provides free, drop-in tutoring assistance for students in any QCC mathematics course. Located on the second floor of the Harrington Learning Center (HLC), the Math Center is a welcoming place where students have the opportunity to work collaboratively with tutors and classmates. Students can work intensively to improve their mathematical skills or simply drop by to ask a few questions. In addition to tutoring, the Math Center houses various math-related resources, and computers and software for math coursework. Visit their website for details and the semester schedule: https://www.qcc.edu/services/tutoring/math-center

For further help, visit the QCC Math YouTube channel. This channel has a playlist specifically for this course, with many short videos created with students like you in mind, covering many of the topics in this course: https://www.youtube.com/user/QCCmath

Assignment & Test Schedule

<list all assignments, quizzes, and exam dates>