Quinsigamond Community College School of Math, Science, & Engineering

Instructor's Information

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

Course: MAT 147 Mathematics for Technicians I – Section XX
Meets: Mondays and Wednesdays from 5:00pm – 6:40pm
Room: 179A
Credits: 4 credits
Semester: Fall 2024

Course Description

This course covers applied mathematical concepts and methods: Content includes a review of basic concepts of arithmetic operations on scientific and engineering notation and algebra. Students are introduced to simple equations, functions and graphs, geometry, right triangles, vectors and oblique triangles. Students learn applications to systems of linear equations, matrices and determinants, ratio, proportion and variation. Solving quadratic equations, basic rules of factoring, power rule, exponents and radicals, radian measure, arc length, and rotation. Pythagorean Theorem and the six trigonometric ratios are also covered.

Restriction: Restricted to Manufacturing Technology programs (MP, MPC), Automotive Technology program (AT), Computer Systems Engineering Technology programs (SECS, SECY, SEIT, SEF), Electronics Engineering Technology programs (EEBI, EEMO, EEPH, CE, CP), and Utility Technology program (UTC)

Prerequisites

MAT 095 Beginning Algebra with a grade of "C" or higher or appropriate placement score

Required Textbook/Materials/Website

Textbook: *Basic Technical Mathematics with Calculus*, by Washington and Evans, 12th edition, Pearson © 2023
Materials: Graphing calculator (recommended)
Website: Required access to mymathlab.com

Student Learning Outcomes

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

1. Perform basic arithmetic operations on numbers in science and engineering.

2. Factor expressions and solve equations.
3. Solve systems of equations using graphing, matrices, and determinants.
4. Perform functions, operations, and graph functions.
5. Solve the sides, area, and volumes of different geometric figures.
6. Use trigonometric ratios and Pythagorean Theorem to solve right and oblique triangles.

Course Topics & Required Section Readings/Assignments

Basic Algebraic Operations (Review)

- Numbers (Review)
- Fundamental Operations of Algebra (Review)
- Calculators and Approximate Numbers (Review)
- Exponents and Unit Conversions (Review)
- Scientific Notation (Review)
- Roots and Radicals (Review)
- Addition and Subtraction of Algebraic Expressions (Review)
- Multiplication and Division of Algebraic Expressions (Review)
- Solving Equations (Review)
- Formulas and Literal Equations (Review)
- Applied Word Problems

Geometry

- Lines and Angles
- Triangles
- Quadrilaterals
- Circles
- Measurement of Irregular Areas
- Solid Geometric Figures

Functions and Graphs

- Introduction to Functions
- More about Functions
- Rectangular Coordinates
- The Graph of a Function
- Graphs on the Graphing Calculator
- Graphs of Functions Defined by Tables of Data

The Trigonometric Functions

- Angles
- Defining the Trigonometric Functions
- Values of the Trigonometric Functions
- The Right Triangle
- Applications of the Right Triangles

Systems of Linear Equations; Determinants

- Linear Equations and Graphs of Linear Equations
- Systems of Equations and Graphical Solutions
- Solving Systems of Two Linear Equations in Two Unknows Algebraically

- Solving Systems of Two Linear Equations in Two Unknows by Determinants

Factoring and Fractions

- Factoring: Greatest Common Factor and Difference of Squares
- Factoring Trinomials
- The Sum and Difference of Cubes
- Equivalent Fractions

Quadratic Equations

- Quadratic Equations; Solution by Factoring
- Completing the Square
- The Quadratic Formula
- The Graph of the Quadratic Function

Trigonometric Functions of Any Angle

- Signs of the Trigonometric Functions
- Trigonometric Functions of Any Angle
- Radians
- Applications of Radian Measure

Vectors and the Oblique Triangles

- Introduction to Vectors
- Components of Vectors
- Vector Addition by Components
- Oblique Triangles, the Law of Sines
- The Law of Cosines

Graphs of the Trigonometric Functions

- Graphs of y = a *sin*(bx + c) and y = a *cos*(bx + c)
- Graphs of y = *tan* x, y = *cot* x, y = *sec* x, y = *csc* x
- Applications of the Trigonometric Graphs
- Composite Trigonometric Curves

Variation

- Ratio and Proportion
- Variation

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

Assignment & Test Schedule

<list all assignments, quizzes, and exam dates>