Quinsigamond Community College School of Math, Science, & Engineering

Instructor's Information

Instructor: Professor XX (she/her/hers)
Office: 200A
Email: xxxxx@qcc.mass.edu
Telephone: 508-854-xxxx

Course Information

Course: MAT 148 Mathematics for Technicians II – Section XX
Meets: Mondays and Wednesdays from 5:00pm – 6:40pm
Room: 179A
Credits: 4 credits
Semester: Spring 2025

Course Description

This course covers applied mathematical and statistical concepts and methods: Topics include Trigonometry, parametric, and polar graphs; Trigonometric identities and equations; Exponential and logarithmic functions; Complex numbers and their applications; Series, sequences and the binomial theorem; Introduction to statistics and probability; Process Control, Correlation and Regression Analysis; Derivatives of algebraic functions.

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 147 Math for Technicians I

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. Graph and analyze trigonometric functions and parametric equations.
2. Verify trigonometric identities and solve trigonometric equations.
3. Graph and solve exponential and logarithmic equations.
4. Solve practical problems using vectors.

5. Solve and simplify complex number equations and expressions in rectangular, trigonometric, and exponential forms.
6. Compute specific terms and find finite and infinite sums of arithmetic, and finite geometric progressions.
7. Use statistics and probabilities to solve application problems.
8. Find the derivative of a function.

Course Topics & Required Section Readings/Assignments

Exponents and Radicals

- Simplifying Expressions with Integer Exponents
- Fractional Exponents
- Simplest Radical Form
- Addition and Subtraction of Radicals
- Multiplication and Division of Radicals

Complex Numbers

- Basic Definitions
- Basic Operations with Complex Numbers
- Graphical Representation of Complex Numbers
- Polar Form of a Complex Number
- Exponential Form of a Complex Number
- Products, Quotients, Powers, and Roots of Complex Numbers
- An Application to Alternating-current (ac) Circuits

Exponential and Logarithmic Functions

- Exponential Functions
- Logarithmic Functions
- Properties of Logarithms
- Logarithms to the Base 10
- Natural Logarithms
- Exponential and Logarithmic Equations
- Graphs on Logarithmic and Semilogarithmic Paper

Sequences and the Binomial Theorem

- Arithmetic Sequences
- Geometric Sequences
- Infinite Geometric Series
- The Binomial Theorem

Additional Topics in Trigonometry

- Fundamental Trigonometric Identities
- The Sum and Difference Formulas
- Double-Angle Formulas
- Half-Angle Formulas
- Solving Trigonometric Equations
- The Inverse Trigonometric Functions

Introduction to Statistics

- Graphical Displays of Data

- Measure of Central Tendency
- Standard Deviation
- Normal Distributions
- Statistical Process Control
- Linear Regression
- Nonlinear Regression

The Derivative

- Limits
- The Slope of a Tangent to a Curve
- The Derivative
- The Derivative as an Instantaneous Rate of Change
- Derivatives of Polynomials
- Derivatives of Products and Quotients of Functions
- The Derivative of a Power of a Function
- Differentiation of Implicit Functions
- Higher Derivatives

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>