

**Quinsigamond Community College
School of Math and Science**

Instructor's Information:

Instructor: <Professor John Smith>
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Course Information:

Course: MAT 148 Mathematics for Technicians II – Section ##
Meets on: <Mondays, Wednesdays, Fridays from 8:00am – 8:50am>
Credits: 4 credit hours

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.

Pre-requisite:

MAT 147

Restriction: Restricted to Applied Manufacturing Option (MPA), Electronics Engineering Technology- Mechatronics Option (EEMO), Manufacturing Technology (MP), Electronics Engineering Technology – Biomedical Instrumentation Option (EEBI), Electronics Engineering Technology – Photonics Option (EEPH), Energy Utility Technology Certificate – (EUTC)

Required Textbook/Materials/Website:

Textbook: *Technical Mathematics with Calculus*, by P. & M. Calter, Wiley Publishing, 6th edition, copyright © 2011

Materials: Graphing calculator

Website: Access to Wiley Plus

Student Learning Outcomes & Instructional Objectives:

This course is designed to achieve the following student outcomes and objectives:

- Graph and analyze trigonometric functions.
- Analyze sine wave as a function of time, find amplitude, period, frequency, and phase shift for a sine wave.
- Evaluate trigonometric expressions and solve and solve trigonometric equations.
- Solve an exponential and logarithmic equations using logarithmic and exponential properties.
- Write complex numbers in rectangular, polar, trigonometric, and exponential forms.
- Solve alternating current applications using complex numbers.

- Compute any term or the sum of any number of terms of an arithmetic and geometric progressions.
- Solve applications problems using series.
- Identify types of data and their graphical distributions.
- Find basic summary statistics; mean median mode, range, quartiles, variance, and standard deviation.
- Calculate probabilities for frequency distributions, including binomial and normal distributions.
- Make control charts for statistical process control.
- Fit a straight line to a set of data using the method of least squares.
- Find the derivatives of an algebraic expressions using the rules for derivatives or by calculator.
- Find rate of change of the tangent line to a curve at a given point.

Teaching Procedures:

Most classes will be a combination of lecture, group activities, and in-class assignments. You will be given homework assignments to be completed outside of class, with due dates/times. There will occasionally be a quiz or exam given in class.

Course Topics & Required Assignments/Readings:

Trigonometric, Parametric, and Polar Graphs

- Graphing the Sine Wave by Calculator
- Manual Graphing of the Sine Wave
- The Sine Wave as a Function of Time
- Graphs of the Other Trigonometric Functions
- Graphing Parametric Equations
- Graphing in Polar Coordinates

Trigonometric Identities and Equations

- Fundamental Identities
- Sum or Difference of Two Angles
- Functions of Double Angles and Half-Angles
- Evaluating Trigonometric Expressions
- Solving Trigonometric Equations

Exponential and Logarithmic Functions

- The Exponential Function
- Logarithms
- Properties of Logarithms
- Exponential Equations
- Solving Logarithmic Equations

Complex Numbers

- Complex Numbers in Rectangular Form
- Complex Numbers in Polar Form
- Complex Numbers on the Calculator
- Vector Operations Using Complex Numbers

- Alternating Current Applications

Sequences, Series, and the Binomial Theorem

- Sequences and Series
- Arithmetic and Harmonic Progressions
- Geometric Progressions
- Infinite Geometric Progressions
- The Binomial Theorem

Introduction to Statistics and Probability

- Definitions and Terminology
- Frequency Distributions
- Numerical Description of Data
- Introduction to Probability
- The Normal Curve
- Standard Errors
- Process Control
- Regression
- Correlation Coefficient

Derivatives of Algebraic Functions

- Limits
- Rate of Change and the Tangent
- The Derivative
- Rules for Derivatives
- Derivative of a Function Raised to a Power
- Derivatives of Products and Quotients

Assignment & Test Schedule:

<list all assignments, quizzes, & exam dates>

Grading Breakdown:

25% Homework
 15% Quizzes
 10% Attendance
 20% Exams
 30% Final Exam/ Final Project

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

Attendance Policy:

Students are expected to attend all classes, for the entire period. Attendance will be taken during every class, and counts towards your final course grade. If you are absent from class, a doctor's note will excuse your absence.

Disability Statement:

If you have a disability which may require an accommodation, please notify me as soon as possible. You are responsible for forwarding your Accommodation Letter to me and discussing arrangements for this course. Your accommodations for this course begin upon my receipt of your Accommodation Letter; accommodations are not retroactive. You may request accommodations at any time during the semester, but instructors must be provided with reasonable notice prior to exams or deadlines.

Disability Services works to promote access to ensure an accessible college experience for students. If you have further questions, contact Disability Services. All discussions are confidential.

Contact Information for Disability Services & Assistive Technology:

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 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 in the classroom 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 the 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.

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