

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

Instructor's Information:

Instructor: <Professor John Smith>
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Course Information:

Course: MAT 147 Mathematics for Technicians I – Section ##
Meets on: <Mondays, Wednesdays, Fridays from 8:00am – 8:50am>
Credits: 4 credit hours

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.

Pre-requisite:

MAT 095 with a grade of “C” or higher; or appropriate placement score

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:

- Perform basic arithmetic operations on numbers in scientific and engineering notation.
- Solve simple equations and apply the skills to simple applications in uniform motion, finance, mixtures containing rational and exponential expressions and statics.
- Recognize and manipulate different forms of a function; equation, table of point pairs, verbal statement, graph.
- Solve equations graphically.

- Solve application problems involving finding the sides, area, angles, surface areas and volumes of different geometrical figures.
- Solve practical problems using vectors.
- Solve applied problems involving oblique triangles using the law of sines and cosines.
- Write a system of equations to describe an application problem and solve those equations.
- Solve a system of linear equations of any size by determinants using calculator or by hand computation.
- Factor expressions.
- Simplify exponential expressions, roots, radicals, and solve equations containing radicals.
- Convert angles between radians, degrees and revolutions.
- Set up and solve applied problems involving variation and power functions.

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:

Review of Numerical Computation

- Scientific Notation and Engineering Notation

- Units of Measurement

Simple Equations and Word Problems

- Solving First-Degree Equations
- Solving Word Problems
- Uniform Motion
- Mixtures
- Statics
- Word, Fluid Flow, and Energy Flow

Functions

- Functions and Relations
- More on Functions

Graphs

- Rectangular Coordinates
- Graphing an Equation
- Graphing a Function by Calculator
- The Straight Line
- Solving an Equation Graphically

Geometry

- Straight Lines and Angles
- Triangles
- Quadrilaterals
- The Circle
- Volumes and Areas of Solids

Right Triangles and Vectors

- The Trigonometric Functions
- Solutions of Right Triangles
- Applications of the Right Triangle
- Angles in Standard Position
- Introduction to Vectors
- Applications of Vectors

Oblique Triangles and Vectors

- Trigonometric Functions of Any Angle
- Find the Angle When the Trigonometric Function is Known
- Law of Sines
- Law of Cosines
- Applications

Systems of Linear Equations

- Systems of Two Linear Equations
- Other Systems of Equations
- Applications
- Systems of Three Linear Equations

Matrices and Determinants

- Introduction to Matrices
- Solving Systems of Equations by the Unit Matrix Method

Factoring and Fractions

- Common Factors
- Difference of Two Squares
- Factoring Trinomials

Quadratic Equations

- Solving a Quadratic Equation by Calculator
- Solving a Quadratic by Formula
- Applications

Exponents and Radicals

- Integral Exponents
- Simplification of Radicals
- Operations with Radicals
- Radical Equations

Radian Measure, Arc Length, and Rotation

- Radian Measure
- Arc Length
- Uniform Circular Motion

Ratio, Proportion, and Variation

- Ratio and Proportion
- Similar Figures
- Direct Variation
- The Power Function
- Inverse Variation
- Functions of More Than One Variable

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.