

Quinsigamond Community College
School of Math and Science

Instructor's Information:

Instructor: <Professor XXXX>
Office: <200A>
Email: <username@qcc.mass.edu>
Telephone: 508-854-2400

Course Information:

Course: MAT 234 Calculus II – Section ##
Meets on: <Mondays, Wednesdays, Fridays from 7:45am – 8:55am>
Credits: 4 credit hours
Semester: <Fall2021>

Course Description:

This course focuses on expanded methods of integration and their application. Derivatives of the exponential, logarithmic and inverse trigonometric functions as well as their antiderivatives will be reviewed. Students learn to compute the customary antiderivatives of functions and apply antidifferentiation to such areas as volumes, moments, centroids, arc lengths and surfaces of revolution. Students will be introduced to differential equations. The use of L'Hopital's Rule and the evaluation of improper integrals are examined. The convergence tests of infinite series as well as the Power, Taylor and Maclaurin series are analyzed.

Pre-requisite:

MAT 233

Required Textbook/Materials/Website:

Textbook: *Calculus: Early Transcendentals* by Briggs; Pearson, 3rd edition, © 2019
Materials: Graphing calculator
Website: Access to www.mymathlab.com

Student Learning Outcomes & Instructional Objectives:

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

- Evaluate velocity position and displacement.
- Calculate net change and future value.
- Evaluate the area of regions between curves.
- Understand the general slicing method and evaluate a volume by slicing.
- Apply correctly the Disk and Washer methods.
- Calculate volume by shells.
- Evaluate the length of curves.
- Understand and evaluate the area of a surface of revolution.
- Define and calculate the work done by a variable force.
- Solve lifting problems.
- Define the natural logarithmic and exponential functions.

- Evaluate the derivative and integral of the exponential function.
- Define and correctly use the General Power Rule.
- Find growth rates using exponential models.
- Define the hyperbolic functions.
- Evaluate derivatives and integrals of hyperbolic functions.
- Use correctly integration by parts for indefinite integrals.
- Apply correctly trigonometric substitutions to evaluate integrals.
- Compute integrals using partial fractions.
- Approximate integrals using Numerical Integration.
- Evaluate Improper Integrals.
- Define and solve separable differential equations.
- Solve special first-order linear differential equations.
- Model with differential equations.
- Define and work with sequences.
- Evaluate the limit of a sequence.
- Evaluate geometric series.
- Determine the divergence of series using the divergence test.
- Determine the convergence or divergence of series using the Integral, Ratio, Root, and Comparison tests.
- Define and work with alternating series.
- Find Taylor polynomials of order n .
- Approximate functions with polynomials.
- Find the interval and radius of convergence of power series.
- Find Taylor and Maclaurin series for a function.
- Work with Taylor Series.

Teaching Procedures:

Most classes will be a combination of lecture, 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:

Applications of Integration

- Velocity and Net Change
- Regions Between Curves
- Volume by Slicing
- Volume by Shells
- Length of Curves
- Surface Area
- Physical Applications

Logarithmic and Exponential Functions

- Logarithmic and Exponential Functions Revisited
- Exponential Models

- Hyperbolic Functions

Integration Techniques

- Basic Approaches
- Integration by Parts
- Trigonometric Integrals
- Trigonometric Substitutions
- Partial Fractions
- Other Integration Strategies
- Numerical Integration
- Improper Integrals

Differential Equations

- Direction Fields and Euler's Method
- Separable Differential Equations
- Special First-Order Linear Differential Equations
- Modeling with Differential Equations

Sequences and Infinite Series

- Sequences
- Infinite Series
- The Divergence and Integral Tests
- The Ratio, Root, and Comparison Tests
- Alternating Series

Power Series

- Approximating Functions with Polynomials
- Properties of Power Series
- Taylor Series
- Working with Taylor Series

Assignment & Test Schedule:

<list all assignments, quizzes, & exam dates>

Grading Breakdown:

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

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.

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

Contact Information for Student Accessibility Services:

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.

The Math Center:

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>