COURSE DESCRIPTION
Topics included in this course are limits, continuity, differentiation and integration of algebraic, trigonometric and transcendental functions, with applications such as optimization problems, curve sketching, and finding area under a curve. Students enrolling in this course should have previously taken two years of high school algebra, a course in plane trigonometry, and a course in analytic geometry, or passed MATH 1314, MATH 1316, and MATH 1348.

COURSE OBJECTIVES
This course is designed to develop an understanding of calculus as it is used in physics, chemistry, engineering, economics, and other subjects. At the same time, mathematics majors and others needing further knowledge of calculus will be able to take MATH 2414 after the completion of this course. The student must demonstrate an understanding of the topics covered in the course through testing.

METHODS FOR ACCOMPLISHING OBJECTIVES
1. Lecture
2. Special Problem Sessions
3. Instructional Media
4. Unit Examinations
5. Peer Tutoring
6. Faculty Tutoring

LEARNING OUTCOMES
Upon successful completion of the course, the student will demonstrate acquisition of the following skills:
1. Finding the absolute extrema of the graph of a function
2. Discussing/evaluating the integrability of the function 1/x
3. Finding rate of acceleration and velocity of a position function
4. Integrating a polynomial function
5. Approximating the value of an integral
6. Finding a derivative by using the chain rule
7. Finding a tangent line to a curve
8. Solving applications involving optimization or related rates
9. Discussing the given proof of a derivative theorem (such as increasing or decreasing properties, the Mean Value Theorem, the Intermediate Value Theorem, etc.)
10. Evaluating limits involving discontinuities

BIBLIOGRAPHY

COURSE OUTLINE
A. Limits and Their Properties
   1. A Preview of Calculus
   2. Finding Limits Graphically and Numerically
3. Evaluating Limits Analytically
4. Continuity and One-Sided Limits
5. Infinite Limits

B. Differentiation
1. The Derivative and the Tangent Line Problem
2. Basic Differentiation Rules and Rates of Change
3. The Product and Quotient Rules and Higher-Order Derivatives
4. The Chain Rule
5. Implicit Differentiation
6. Related Rates

C. Applications of Differentiation
1. Extrema on an Interval
2. Rolle’s Theorem and the Mean Value Theorem
3. Increasing and Decreasing Functions and the First Derivative Test
4. Concavity and the Second Derivative Test
5. Limits at Infinity
6. A Summary of Curve Sketching
7. Optimization Problems
8. Newton’s Method (optional)
9. Differentials

D. Integration
1. Antiderivatives and Indefinite Integration
2. Area
3. Riemann Sums and Definite Integrals
4. The Fundamental Theorem of Calculus
5. Integration by Substitution
6. Numerical Integration (optional)

E. Logarithmic, Exponential, and Other Transcendental Functions
1. The Natural Logarithmic Function: Differentiation
2. The Natural Logarithmic Function: Integration
3. Inverse Functions
4. Exponential Functions: Differentiation and Integration
5. Bases Other than $e$ and Applications

F. Differential Equations (optional)
6. Differential Equations: Growth and Decay (optional)
7. Differential Equations: Separation of Variables (optional)

**Evaluation Procedures:**

A. Methods of Evaluation
1. Homework
2. Quizzes
3. Exams
4. Comprehensive Final Exam

B. Grading System

<table>
<thead>
<tr>
<th>Course Average</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100</td>
<td>A</td>
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</table>
80 - 89    B
70 - 79    C
60 - 69    D
below 60  W, I, or F

• I  Incomplete – An incomplete may be awarded when the instructor determines that minimal work on the part of the student and the instructor will complete the course requirements. An incomplete grade not changed by the instructor to a grade of completion (A, B, C, D, or F) by the end of the following semester will automatically be changed to an F.
• W  Withdrawal – Students who file withdrawal requests by the published deadline will receive a grade of W.

ATTENDANCE
Regular attendance in class is expected. If an absence is unavoidable, the student is responsible for completing all work missed during the absence. Any work missed and not subsequently completed will affect the grade of the student regardless of the reason for the absence. It should be noted that ceasing to attend class does not terminate enrollment. It is the student’s responsibility to initiate the withdrawal procedure. Therefore, a student who ceases to attend class without officially withdrawing from that class may receive a failing grade. Note, however, that withdrawal from class may affect enrollment in other courses, insurance eligibility, financial aid, and/or veteran’s benefits.

CLASSROOM BEHAVIOR
It is expected that students will behave in a mature and courteous manner. Disruptive behavior during class will not be tolerated. Students are expected to be attentive, take notes, ask pertinent questions, arrive on time, and not leave until the class is dismissed. Conflicts which arise between the scheduled class time and the student's personal schedule must be resolved by the student.
Camcorders and any other video recording devices are prohibited in the classroom. Audio recording may be allowed ONLY WITH THE PERMISSION OF THE INSTRUCTOR.

CELLPHONES are not to be used and are not to ring during class. Cell phones are not to be out during tests. If there are special circumstances, arrangements must be made with the instructor.

ACADEMIC HONESTY IS ASSUMED. A student found guilty of scholastic dishonesty is subject to disciplinary action. Violations such as plagiarism, cheating on tests, and collusion are described in the ACC Student Handbook. Consequences are at the discretion of the instructor. Any student caught cheating in the course will be given an F for the course and will forfeit any right to a grade of W.

ADA COMPLIANCE
This college will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the policy of ACC to provide reasonable accommodations for qualified individuals who are students with disabilities. It is the student’s responsibility to contact the Counseling Center in a timely manner to arrange for appropriate accommodations.