

SYLLABUS
MATH 1220
MR. SHAFIQUE A. WARSI

I. COURSE TITLE: Applied Calculus

II. COURSE DESCRIPTION: Intuitive approach to the differential and integral calculus with applications in variety of fields.
Prerequisite(s): MATH 1111 or MATH 1101 (grade of C or better), with MATH 1111 recommended or advanced placement.

III. COURSE OBJECTIVES:

The course will introduce some of the central concepts of the calculus and will demonstrate how these concepts can be applied to solve problems in a variety of areas, with particular emphasis from business, economics, and sociology. At the end of the course, students will be able to:

1. Plot points in the Cartesian plane and find the distance between two points.
2. Sketch the graph of an equation, and find the x- and y-intercepts.
3. Write equations of lines in slope-intercept form and sketch the lines.
4. Evaluate functions and simplify.
5. Find the limit of a function graphically, analytically, and numerically.
6. Find the slope of a graph and calculate derivatives using the limit definition.
7. Use the Constant Rule, Power Rule, Constant Multiple Rule, and Sum and Difference Rules.
8. Find rates of change: velocity, marginal revenue, and marginal cost.
9. Use the Product, Quotient, Chain, and General Power Rules.
10. Calculate higher –order derivatives and derivatives using implicit differentiation.
11. Solve related-rate problems and applications.
12. Find the open intervals on which a function is increasing or decreasing.
13. Determine relative and absolute extrema of a function.
14. Determine the concavity and points of inflection of a graph.
15. Solve real-life optimization problems.
16. Determine the vertical and horizontal asymptotes of a graph.
17. Use calculus to analyze the shape of the graph of a function.
18. Use differentials in marginal analysis applications.
19. Calculate derivatives of exponential functions.
20. Graph the logarithmic function $f(x) = \ln x$ and use it to solve
21. Exponential and logarithmic equations.
22. Calculate derivatives of logarithmic functions.
23. Find the antiderivative F of a function f ; that is, $F'(x) = f(x)$.
24. Use the General Power Rule to calculate antiderivatives.
25. Use the Exponential Rule and the Log Rule to calculate antiderivatives.
26. Evaluate definite integrals and apply the Fundamental Theorem of Calculus.

27. Use the Fundamental Theorem of Calculus to find the area bounded by two Graphs.
28. Use integration to find the volume of a solid of revolution.

IV. Textbook and Other Requirements

1. TEXTBOOK:

- A. Authors: Ron Larson
- B. Name of Text: Brief Calculus; an applied approach
- C. Publisher: Houghton Mifflin

2. Calculator

V. Course Requirements:

- A. The attendance will be followed by the policies that Augusta State University has established.
- B. There will be no homework assignments for grading, but students will be expected to work some of the problems during the class period and others at home.
- C. The students will be allowed to drop the lowest test score, but **NOT THE FINAL EXAMINATION SCORE.**

VI. EVALUATION PROCEDURES:

The final grade will be based upon:

- (i) Average of semester examination 60%
- (ii) Final Examination 40%

After dropping the lowest test score, final grading scale will be as follows.

<u>Range</u>	<u>Grade</u>
540-600	A
480-539	B
420-479	C
360-419	D
Below 360	F

VII. COURSE OUTLINE

Week 1	Algebra Review
Week 2	Algebra Review (cont.) Function, Graphs and Limits
Week 3	Function, Graphs and Limits (cont.)
Week 4	The Derivative and the slope of a graph

Week 5	Some Rules of Differentiation Rates of Change: Marginals The Product and Quotient Rules
Week 6	The Chain Rule
Week 7	Higher-Order Derivatives Implicit Differentiation
Week 8	Related Rates Increasing and Decreasing Functions Extrema and First Derivative Test
Week 9	Concavity and the Second Derivative Test
Week 10	Optimization Problems Business and Economics Applications,
Week 11	Asymptotes Derivative of Exponential Functions
Week 12	Derivative of Logarithmic Functions Antiderivatives and Indefinite Integrals
Week 13	The General Power Rule
Week 14	Area and the Fundamental, Theorem of calculus
Week 15	The Area of a Region Bounded by Two Graphs
Week 16	The Area of a Region Bounded by Two Graphs (contd.) Review for Final Examination