Math 26A Sec _____ Spring 2005

Title: Calculus I for the Social and Life Sciences

Catalog Description: Limits, differentiation with applications, integration and applications in the Social and Life Sciences. Students will be given periodic writing assignments that encourage them to express various concepts of the course.

Prerequisites: Math 11 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of the ELM requirement and a passing score on the Intermediate Algebra diagnostic test.

Learning Objectives: Understand the definition of the derivative and interpret the definition geometrically and in a variety of applied contexts including instantaneous velocity
Know the fundamental rules of differentiation including the chain rule and use these rules to compute the derivatives of polynomials, rational functions, exponential, and logarithmic functions.
Use the limits and the derivative to identify asymptotes, relative extrema, and inflection points of curves and apply these techniques to curve sketching.
Know the Extreme Value Theorem and use this result to solve optimization problems.
Understand the indefinite integral as the inverse of differentiation, know the basic rules of integration, and use these rules to evaluate elementary antiderivatives.

Text: Calculus - An Applied Approach (7^{th} ed) by Larson / Edwards

Coverage: Chapters 1 thru 4 and parts of 5

Writing Component: This is an area B4 GE course and has a writing component. To satisfy the writing requirement graded assignments involving writing and understanding of complex technical prose, interpretation of theoretical ideas, and the use of mathematical ideas will be part of the course.

Assignments: A variety of reading and problem solving assignments will be part of the course.

Examinations: There will be three midterm examinations and a comprehensive final examination for this course.
The examination schedule is given below.

Midterm I	Feb. 16
Midterm II	Mar. 16
Midterm III	Apr. 27
Final	May 18

Grading: Written work is scored on the following scale and your grade in this course is assigned according to the following percentages.

Homework	150 (10.0%)	88% - 100%	A
Midterms (150 pts each)	450 (45.0%)	76% - 87%	B
Final	400 (40.0%)	65% - 76%	C
		50% - 64%	D
Total	1000	below 50%	F

TOPICS COVERED: Math 26 A

I. Algebra Review — 1 week

a. Simplifying expressions, exponents and radicals
b. Factoring
c. Algebraic fractions
d. Solving equations and inequalities
e. Absolute values
f. The Cartesian plane, equations of lines, distance formula

II. Functions, Limits and the Derivative — 5 weeks

a. The definition of a function
b. Introduction to limits and continuity
c. The definition of the derivative
d. Rules of differentiation
e. The Chain rule
f. Higher order derivative
g. Implicit differentiation and related rates

III. Applications of the derivative 3 weeks

a. Increasing and decreasing functions
b. Concavity
c. Maximum and minimum values
d. Curve sketching
e. Optimization problems

IV. Exponential and Logarithmic functions 4 weeks

a. Definitions of the exponential and logarithmic functions
b. Laws of exponential and logarithms
c. Exponential growth and decay
d. L'Hôpital's Rule

V. Integration 2 weeks

a. Antiderivatives and indefinite integrals
b. Integration by substitution