MATH 151 – Calculus I

Course Description from Bulletin: Analytic geometry. Functions and their graphs. Limits and continuity. Derivatives of algebraic, trigonometric and inverse trigonometric functions. Applications of the derivative. Introduction to integrals and their applications. (4-1-5) (C)

Enrollment: Required for AM majors and all engineering majors

Textbook(s): Stewart, *Calculus*, 5th ed., Brooks/Cole.

Other required material: Maple

Prerequisites: Must pass departmental pre-calculus placement exam

Objectives:
1. Students will understand and be able to apply the concept of limit, continuity, differentiation, and integration (all single variable).
2. Students will learn to distinguish between definitions and theorems and will be able to use them appropriately.
3. Students will know and be able to apply laws/formulas to evaluate limits, derivatives, and (some) integrals.
4. Students will interpret the basic calculus concepts from both algebraic and geometric viewpoints.
5. Students will be able to use calculus in basic applications, including related rate problems, linear approximation, curve sketching, optimization, Newton's method, volume and area.
6. Students will use Maple for visualization and calculating exact and approximate solutions to problems.
7. Students will do a writing project.

Lecture schedule: 4 50 minute (or 3 67 minute) lectures and 1 75 minute TA session (Maple computer lab and recitation) per week

Course Outline: Hours
1. Elementary analytic geometry, functions, trigonometry   3
2. Limits, continuity, tangent lines   7
3. The derivative, differentiation of algebraic and trigonometric functions,   18
   implicit functions, related rates of change
4. Applications of the derivative   6
5. Theory of inverse functions and their derivatives, inverse trigonometric   3
   functions and their derivatives
6. Anti-derivatives, definite and indefinite integrals, Fundamental   13
   Theorem of Calculus
7. Applications of the Integral   5

Assessment:		
Homework/Quizzes	10-20%
Maple Lab/Recitation	5-15%
Tests	40-50%
Final Exam	25-30%

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