

MATH 151 – Calculus I

Course Description from Bulletin: Analytic geometry. Functions and their graphs. Limits and continuity. Derivatives of algebraic and trigonometric. 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): James Stewart, *Calculus* (9th Ed.), Cengage (2021), ISBN:9781337624183 (Recommended if the entire Calculus sequence will be taken. For MATH 151 and 152 only, Stewart's *Single Variable Calculus* suffices.)

Other required material: WebAssign access (comes bundled with Stewart Calculus), Mathematica (free download from OTS for IIT students)

Prerequisites: Must pass departmental pre-calculus placement exam, or grade of "C" or better in MATH 145 or MATH 148

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 Mathematica for visualization and calculating exact and approximate solutions to problems.
7. Students will do a writing project.

Lecture schedule: Three 75 minute lectures per week

Laboratory/Recitation schedule: One 75 minute period per week, alternating laboratory with recitation.

Course Outline:

	Hours
1. Elementary analytic geometry, functions, trigonometry	4
2. Limits, continuity, tangent lines	6
3. The derivative, differentiation of algebraic and trigonometric functions, implicit functions, related rates of change	14
4. Applications of the derivative	9
5. Anti-derivatives, definite and indefinite integrals, Fundamental Theorem of Calculus	11
6. Applications of the Integral	6

Assessment:	Homework/Quizzes	30%
	Mathematica Lab	5%
	3 Tests	30%
	Common Final Exam	35%

Syllabus prepared by: Michael Pelsmajer and Dave Maslanka

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