

Mathematics 103X – Honors Intermediate Calculus

- Geometry in 2-D and 3-D: Vector algebra, lines, planes, distance problems, parametric curves, surfaces
- Multi-variable Calculus:
 - Differential Calculus: Limits, Partial derivatives, Grad, Div, and Curl, chain rule, implicit function theorems, max/min problems and Lagrange multipliers.
 - Integral Calculus: Area, Volume, Line, and Surface integrals, Jacobians, and the fundamental theorems of vector calculus.

Section 01 Mon, Wed, Fri 1:30–2:20 PM Room 259 Physics Building

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Textbook: *Vector Calculus* (Third Edition) by S. J. Colley, Prentice Hall, 2006.

Course Outline:

Part 1:	<u>Geometry of curves and surfaces in 2-D and 3-D</u> Vector algebra Lines, planes, and distance problems Calculus on parametric curves	Sections 1.1, p.9, 1.3, 1.4 Sections 1.2, 1.5 Sections 1.2, 3.1, 3.2
Part 2:	<u>Derivatives of functions of several variables</u> Limits, Partial derivatives Multi-variable max/min problems	Chapter 2 Chapter 4
Part 3:	<u>Area, Volume, and Surface integrals</u>	Chapter 5, Sections 1.7, 7.1, 7.2
Part 4:	<u>The fundamental theorems of vector calculus</u> Vector differential operators Line integrals, Conservative fields, and Green’s Theorem Flux integrals, Gauss’ Theorem and Stokes’ Theorem	Sections 3.3, 3.4 Chapter 6 Sections 7.2, 7.3

Tests: There will be four one-hour, in-class tests (one after each “Part”) and a cumulative final exam. No calculators may be used on the tests. Tentative dates for the first two tests are **Sept 20, Oct 6**.¹

Homework: Homework problems will be assigned after each lesson. The assignments will be collected weekly. You are encouraged to study together and discuss the homework, but you must write up your homework assignments individually. **Doing the homework is very important because it is the primary way that you will learn how to solve and understand the kinds of problems that will appear on the exams!** No unexcused late homework will be accepted.

Final Grade: Your final grade will be based on the homeworks (10%), the four in-class tests (60%) and the final exam (30%) (**Thursday, December 14, 2006, 7:00–10:00 PM**).

¹Prior approval or an official excuse letter are required to be excused from a test.