

Hunter College of The City University of New York

MATH 250 Calculus with Analytic Geometry III 4 hrs, 4 cr.

Textbook: Vector Calculus by Marsden and Tromba, 5th edition, W.H. Freeman, ISBN:
0-7167-49920

Chapter 1 The Geometry of Euclidean Space

- 1.1 Vectors in Two- and Three-Dimensional Space
- 1.2 The Inner Product, Length, and Distance
- 1.3 Matrices, Determinants, and the Cross Product
- 1.4 Cylindrical and Spherical Coordinates
- 1.5 n -Dimensional Euclidean Space

Chapter 2 Differentiation

- 2.1 The Geometry of Real-Valued Functions
- 2.2 Limits and Continuity
- 2.3 Differentiation
- 2.4 Introduction to Paths and Curves
- 2.5 Properties of the Derivative
- 2.6 Gradients and Directional Derivatives

Chapter 3 Higher-Order Derivatives; Maxima and Minima

- 3.1 Iterated Partial Derivatives
- 3.2 Taylor's Theorem
- 3.3 Extrema of Real-Valued Functions
- 3.4 Constrained Extrema and Lagrange Multipliers
- 3.5 The Implicit Function Theorem

Chapter 4 Vector-Valued Functions

- 4.1 Acceleration and Newton's Second Law
- 4.2 Arc Length
- 4.3 Vector Fields OPTIONAL

Chapter 5 Double and Triple Integrals

- 5.1 Introduction
- 5.2 The Double Integral Over a Rectangle
- 5.3 The Double Integral Over More General Regions
- 5.4 Changing the Order of Integration
- 5.5 The Triple Integral

Chapter 6 The Change of Variables Formula and Applications of Integration

- 6.1 The Geometry of Maps from \mathbb{R}^2 to \mathbb{R}^2
- 6.2 The Change of Variables Theorem
- 6.3 Applications
- 6.4 Improper Integrals