



CALCULUS III

21:640:235 (4 credits)

COURSE DESCRIPTION:

Introduction to vectors in the plane, solid analytic geometry, and vectors in three dimensions; partial differentiation; multiple integrals; applications.

PREREQUISITE:

21:640:136 (Calculus II), or 156 (Honors Calculus II.)

IMPORTANT NOTE:

Students who took 21:640:136 (Calculus II) or 156 (Honors Calculus II) for 3 credits, prior to Spring 2000, should arrange with the Mathematics Department Undergraduate Program Director to complete the missing credit in Calculus II before taking Calculus III.

TEXTBOOK: "Calculus Multivariable," (1st edition), by Briggs, published by Pearson.

DEPARTMENT WEB SITE: <http://www.ncas.rutgers.edu/math>

FREE TUTORING: is available in the Rutgers Learning Center, Room 140 Bradley Hall (973-353-5608.)

THIS COURSE COVERS THE FOLLOWING CHAPTERS AND SECTIONS:

Chapter 11:

- 11.1 Cartesian Coordinates in Three-Space
- 11.2 Vectors
- 11.3 The Dot Product
- 11.4 The Cross Product
- 11.5 Vector-Valued Functions and Curvilinear Motion
- 11.6 Lines and Tangent lines in three-Space
- 11.7 Curvature and Components of Acceleration
- 11.8 Surfaces in Three-Space
- 11.9 Cylindrical and Spherical Coordinates

Chapter 12:

- 12.1 Functions of Two or More Variables
- 12.2 Partial Derivatives
- 12.3 Limits and Continuity
- 12.4 Differentiability
- 12.5 Directional Derivatives and Gradients
- 12.6 The Chain Rule
- 12.7 Tangent Planes and Approximations

- 12.8 Maxima and Minima
- 12.9 The Method of Lagrange Multipliers

Chapter 13:

- 13.1 Double integrals over Rectangles
- 13.2 Iterated Integrals
- 13.3 Double Integrals over Nonrectangular Regions
- 13.4 Double Integrals in Polar Coordinates
- 13.5 Applications of Double Integrals
- 13.6 Surface Area
- 13.7 Triple Integrals in Cartesian Coordinates
- 13.8 Triple Integrals in Cylindrical and Spherical Coordinates
- 13.9 Change of Variables in Multiple Integrals

Chapter 14:

- 14.1 Vector Fields
- 14.2 Line Integrals
- 14.3 Independence of Path
- 14.4 Green's Theorem in the Plane
- 14.5 Surface Integrals
- 14.5 Gauss's Divergence Theorem
- 14.6 Stokes's Theorem

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