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:

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: Vectors and Vector-Valued Functions
  11.1 Vectors in the Plane
  11.2 Vectors in Three Dimensions
  11.3 Dot Products
  11.4 Cross Products (excluding subsection "Applications of the Cross Product")
  11.5 Lines and Curves and in Space
  11.6 Calculus of Vector-Valued Functions
  11.7 Motion in Space (excluding subsection "Range, Time of Flight, Maximum Height")
  11.8 Length of Curves
  11.9 Curvature and Normal Vectors (include just vectors T, N, B and scalar-valued function K by first definition)
Chapter 12: Functions of Several Variables
12.1 Planes and Surfaces
12.2 Graphs and Level Curves
12.3 Limits and Continuity
12.4 Partial Derivatives (exclude subsection "Applications of Partial Derivatives")
12.5 The Chain Rule
12.6 Directional Derivatives and the Gradient
12.7 Tangent Planes and Linear Approximation
12.8 Maximum/Minimum Problems
12.9 Lagrange Multipliers

Chapter 13: Multiple Integration
13.1 Double Integrals over Rectangles
13.2 Double Integrals over General Regions
13.3 Double Integrals in Polar Coordinates
13.4 Triple Integrals
13.5 Triple Integrals in Cylindrical and Spherical Coordinates
13.7 Change of Variables in Multiple Integrals (excluding subsection "Change of Variables in Triple Integrals")

Chapter 14: Vector Calculus
14.1 Vector Fields
14.2 Line Integrals
14.3 Conservative Vector Fields
14.4 Green’s Theorem (just include "Green's Theorem in Circular Form" and "Green's Theorem in Flux Form" - do not include proofs)