CALCULUS I
21:640:135 (4 credits)

COURSE DESCRIPTION:
Functions, limits, continuity, the derivative and rules for differentiation, applications, introduction to definite and indefinite integration, calculus of exponential and logarithmic functions, calculus of trig and inverse trig functions.

PREREQUISITE:
21:640:114 (Precalculus) or placement by examination.

IMPORTANT NOTE:
Credit NOT given for both 21:640:119 (Basic Calculus) and 21:640:135 (Calculus I.)

TEXTBOOK:

DEPARTMENT WEBSITE: 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:
The following topics will be covered, not necessarily in the order given. In particular, some material from Chapter 2 (Limits) may be integrated into the discussion of the derivative and its applications. Elementary material from Chapter 1 will be reviewed as necessary.

Chapter 2: Limits
2.1 The Idea of Limits
2.2 Definitions of Limits
2.3 Techniques for Computing Limits
2.4 Infinite Limits (integrated into later sections, e.g. 3.8, 3.9, 4.3, 4.7)
2.5 Limits at Infinity (integrated into later sections, e.g. 3.8, 3.9)
2.6 Continuity
Chapter 3: Derivatives
3.1 Introducing the Derivative
3.2 The Derivative as a Function
3.3 Rules of Differentiation
3.4 The Product and Quotient Rules
3.5 Derivatives of Trigonometric Functions
3.6 Derivatives as Rates of Change (1st part)
3.7 The Chain Rule
3.8 Implicit Differentiation
3.9 Derivatives of Logarithmic and Exponential Functions
3.10 Derivatives of Inverse Trigonometric Functions
3.11 Related Rates

Chapter 4: Applications of the Derivative
4.1 Maxima and Minima
4.2 Mean Value Theorem
4.3 What Derivatives Tell Us
4.4 Graphing Functions
4.5 Optimization Problems
4.6 Linear Approximation and Differentials (cover just last subsection, i.e."Differentials")
4.7 L'Hôpital's Rule
4.9 Antiderivatives

Chapter 5: Integration
5.1 Approximating Area under Curves
5.2 Definite Integrals
5.3 Fundamental Theorem of Calculus
5.4 Working with Integrals
5.5 Substitution Rule

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