RUTGERS
UNIVERSITY | NEWARK

APPLIED CALCULUS

21:640:119 (4 credits)

COURSE DESCRIPTION:
Intuitive approach to calculus with emphasis on applications, differential and integral calculus, and multivariable calculus.

PREREQUISITES:
21:640:108 (College Algebra for Business) or 21:640:109 (College Algebra for Physical Sciences) or 21&62:640:112 (College Algebra Intensive) or 21&62:640:113 (College Algebra) or placement by examination.

COURSE OBJECTIVE:
This course is a rapid survey of Calculus. Starting with a review of functions, the course proceeds through the highlights of differential, integral, and even some multi-variable calculus.

IMPORTANT NOTES:
1. Applied Calculus is intended for students who will NOT be taking Calculus I or further Calculus courses.

2. Students will NOT receive credit for both (21:640:119) Basic Calculus and (21:640:135) Calculus I.

3. Applied Calculus is NOT a preparation for Calculus II. If you need to take a math course beyond Calculus I, then this course is NOT for you.

4. This course is intended for students majoring in Information Systems, Business, Social Sciences, or Liberal Arts.

TEXTBOOK:
"Calculus & Its Applications 14th Edition with My Math Lab," by Goldstein, 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 0**:**
0.1 Functions and Their Graphs
0.2 Some Important Functions
0.3 The Algebra of Functions
0.4 Zeros of Functions-The Quadratic Formula and Factoring
0.5 Exponents and Power Functions
0.6 Functions and Graphs in Applications

Chapter 1**:**
1.1 The Slope of a Straight Line
1.2 The Slope of a Curve at a Point
1.3 The Derivative
1.4 Limits and the Derivative
1.5 Differentiability and Continuity
1.6 Some Rules for Differentiation
1.7 More about Derivatives
1.8 The Derivative as a Rate of Change

Chapter 2:
2.1 Describing Graphs of Functions
2.2 The First and Second Derivative Rules
2.3 Curve Sketching (introduction)
2.4 Curve Sketching (conclusion)
2.5 Optimization Problems
2.6 Further Optimization Problems
2.7 Applications of Derivatives to Business and Economics

Chapter 3:
3.1 The Product and Quotient Rules
3.2 The Chain Rule and the General Power Rule
3.3 Implicit Differentiation and Related Rates

Chapter 4:
4.1 The Exponential and Natural Logarithmic Functions
4.2 The Exponential Function e^x
4.3 Differentiation of Exponential functions
4.4 The Natural Logarithm
4.5 The Derivative of $\ln x$
4.6 Properties of Natural Logarithm Functions

Chapter 5**:**
5.1 Exponential Growth and Decay
5.2 Compound Interest

Chapter 6**:**
6.1 Antidifferentiation
6.2 Areas and Riemann Sums
6.3 Definite Integrals and The Fundamental Theorem
6.4 Areas in the xy-plane
6.5 Application of the Definite Integral

Chapter 7**:**
7.1 Examples of Functions of Several Variables
7.2 Partial Derivatives
7.3 Maxima and Minima of Functions of Several Variables
7.4 Lagrange Multipliers and Constrained Optimization

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