

Departmental Syllabus

Math 2630 -- Calculus with Applications

Textbook: Mathematics – An Applied Approach, 8th ed., by Sullivan and Mizrahi

Prerequisites: MATH 1530, MATH 1630, or MATH 2450, or mathematics proficiency level of 30 or above.

Calculators: No specific calculator required. (NOTE: On occasion, individual instructors may restrict the use of any type of calculator).

Course Description: Functions, limits, rates of change, exponential and logarithmic functions, differentiation, integration; with applications in the fields of business and economics.

Topics and sections to be covered:

- 10.1 Graphs of Equations
- 10.2 Functions
- 10.3 Graphs of Functions; Properties of Functions
- 10.4 Library of Functions; Piecewise-defined Functions
- 10.5 Graphing Techniques: Shifts and Reflections

- 11.1 Quadratic Functions
- 11.2 Power Functions; Polynomial Functions; Rational Functions
- 11.3 Exponential Functions
- 11.4 Logarithmic Functions
- 11.5 Properties of Logarithms
- 11.6 Continuously Compounded Interest

- 12.1 Finding Limits Using Tables and Graphs
- 12.2 Techniques of Finding Limits of Functions
- 12.3 One-sided Limits; Continuous Functions (Optional)
- 12.4 Limits at Infinity; Infinite Limits; End-Behavior; Asymptotes (Optional)

- 13.1 The Definition of a Derivative
- 13.2 The Derivative of a Power Function; Sum and Difference Formulas
- 13.3 Product and Quotient Formulas
- 13.4 The Power Rule
- 13.5 The Derivatives of the Exponential and Logarithmic Functions; the Chain Rule
- 13.6 Higher-Order Derivatives
- 13.7 Implicit Differentiation (Optional)

- 14.1 Horizontal and Vertical Tangent Lines; Continuity and Differentiability
- 14.2 Increasing and Decreasing Functions; the First Derivative Test

- 14.3 Concavity; the Second Derivative Test
 - 14.4 Optimization
 - 14.5 Elasticity of Demand
 - 14.6 Related Rates (Optional)
 - 14.7 The Differential and Linear Approximations

 - 15.1 Antiderivatives; The Indefinite Integral; Marginal Analysis
 - 15.2 Integration Using Substitution
 - 15.3 Integration by Parts
 - 15.4 The Definite Integral; Learning Curves; Sales over Time
 - 15.5 Finding Areas; Consumer's Surplus, Producer's Surplus; Maximizing Profit over Time
- Total: 30 sections, plus 4 optional sections.