

<b>MATH 1680 QUANTITATIVE BUSINESS ANALYSIS II</b>
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**3 Credits**

**Offered in Lecture Format**

**Prerequisite required (MATH 1670 with a grade of C or better)**

Revised 3/24/93

**SYLLABUS**

**I. LIMITS AND CONTINUITY**

- A. Definition and basic properties of limits
- B. One-sided limits
- C. Limits involving infinity
- D. Definition of a continuous function
- E. Determination of points of discontinuity of a function

**II. INTRODUCTION TO THE DERIVATIVE**

- A. Definition of the derivative
- B. Using the definition to find the derivative of a function
- C. Derivative as a slope
- D. Derivative as a rate of change

**III. DIFFERENTIATION FORMULAS**

- A. Power function rule
- B. Sum and difference rules
- C. Product and quotient rules
- D. Chain rule
- E. Power rule
- \*F. Implicit differentiation

**IV. DERIVATIVES OF SPECIAL FUNCTIONS**

- A. Exponential function
- B. Logarithmic function

**V. HIGHER ORDER DERIVATIVES: NOTATION AND COMPUTATION**

**VI. CURVE SKETCHING WITH FIRST AND SECOND DERIVATIVES**

- A. Increasing and decreasing functions
- B. Relative extrema using first derivative test
- C. Relative extrema using second derivative test
- D. Absolute extrema
- E. Concavity and points of inflection
- F. Sketching graphs

**VII. BUSINESS APPLICATIONS OF THE DERIVATIVE**

- A. Marginal cost and marginal revenue
- B. Marginal propensity to consume and save

- C. Applied maxima and minima
  - 1. Cost and revenue problems
  - 2. Area problems
  - 3. Volume problems
- D. Point elasticity of demand

## VIII. INTRODUCTION TO INTEGRATION

- A. Antiderivatives
- B. Integral notation and terminology

## IX. INTEGRATION FORMULAS

- A. Power rule
- B. Exponential rule
- C. Logarithmic rule
- \*D. Integration by parts

## X. THE DEFINITE INTEGRAL

- A. Definition
- B. Properties
- C. Fundamental theorem of integral calculus

## XI. DEFINITE INTEGRAL AS AREA

- A. Area under a curve
- B. Area between curves

## XII. APPLICATIONS OF INTEGRATION

- A. Area as revenue, cost, profit
- \*B. Consumers' and producers' surplus
- \*C. Profit over time

\*Optional