Montgomery College - Department of Mathematics
Rockville Campus

MA160 – Applied Elementary Calculus I
4 Semester Hours

Description

A general calculus course primarily for business students. Topics include algebraic, exponential, and logarithmic functions and their graphs, an intuitive approach to limits, differentiation, integration, and functions of several variables. Major emphasis is on applications in business, economics, and the life sciences. Not open for credit to students who have a grade of C or better in MA 181 or its equivalent.

MA160 meets 4 hours each week.

Prerequisites

A grade of C or better in MA 103, appropriate score on mathematics assessment test, or consent of department.

Assessment levels: EN 101/101A, RD 120.

Topics

I. Functions and Graphs
   1. Graphing functions and equations
   2. Domain and range of functions
   3. Linear functions
   4. Finding the formula given slope and a point
   5. Finding the formula given 2 points
   6. Quadratic functions
   7. Linear regression

II. Limits
   1. Numerically
   2. Graphically
   3. Algebraically

III. Continuity

IV. Differentiation
   1. Using limits of difference quotients
   2. Power and sum-difference rules
   3. Product and quotient rules
   4. Chain rule
   5. Higher derivatives

V. Applications of derivatives
    1. Using the first derivative test to find extrema
    2. Using the second derivative test to find extrema and inflection points
    3. Curve sketching of polynomial and rational functions
    4. Absolute maximum and minimum values of functions
    5. Applied maximum and minimum problems

VI. Exponential and logarithmic functions
    1. Exponential growth and decay applications

VII. Integration
    1. Antidifferentiation
    2. Fundamental Theorem of Calculus
    3. Area and definite integration

VIII. Applications of Integration
    1. Average value
    2. Total change
    3. Consumer's and Producer's surplus
    4. Applications of the exponential growth model

IX. Functions of several variables
    1. Definitions and graphing
    2. Partial differentiation

Text

Calculus and Its Applications, 9th Edition, Bittinger and Ellenbogen, Pearson Publishing, 2008.