

San Francisco State University
Department of Mathematics
Course Syllabus

MATH 110
Business Calculus

Prerequisites

Satisfactory completion of ELM requirement.

Bulletin Description

Functions, derivatives, and applications of differentiation, including optimization. Problems involving business, finance, and economics. Elements of basic calculus.

Course Objectives

The principal aim of Business Calculus is for students to grasp the concept of rate of change in the context of business and financial applications. Students should understand average and instantaneous rates of change and their relations to the notion of marginal analysis of cost, revenue, and profit functions. They should be able to explain their understanding in their own words and solve problems requiring marginal analysis of simple production cost and supply/demand models. In solving these problems they should make appropriate use of differentiation formulas for powers, roots, exponentials and logarithms, and of basic differentiation rules. Students should understand simple optimization problems and be able to solve them using differential calculus.

Optionally, instructors may include the use of spreadsheets for graphical and numerical analysis of simple financial models.

Evaluation of Students

Instructors design their own assessment schemes, which should include graded homework, midterm examinations and a final exam. The final exam must include problems covering the following measurable student learning outcomes (MSLOs):

[Analyzing rates] Use rates of change in solving business problems;

[Differentiation] Differentiate functions using differentiation formulas;

[Optimization] Analyze and solve optimization problems using the differential calculus;

Writing about mathematical topics is a component of this course, and students should be engaged in some graded writing assignments during the semester. Application problems in exams should require written interpretations of the results. These interpretations are to be expressed in complete sentences with correct grammar, proper diction, and adequate punctuation. Appropriate units must be attached to all numerical quantities.

Course Outline

1. Review of algebra concepts and introduction to average rate of change. Includes review of polynomials, exponential and logarithmic functions.
2. Conceptual development of instantaneous rates of change with applications to economics and business.
3. Formal differentiation.
4. Applications mostly to business and economics including optimization.

Textbooks and Software

S. Waner and S. Costenoble, *Math for Business Analysis*, Thomson, 2008. (This is a custom edition for MATH 110, SFSU).

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