

MATH 134 - CALCULUS FOR MANAGEMENT AND SOCIAL SCIENCES (4 credits)

Prerequisites

MATH 104 (Precalculus for Management and Social Science) or two years of high school algebra and sufficient score in the Placement Test.

Catalog description

A one-semester introduction to differential and integral calculus. Theory is presented informally and topics and techniques are limited to polynomials, rational functions, logarithmic and exponential functions. The course cannot be used to satisfy core or complementary requirements by students majoring in chemistry, computer science, engineering, mathematics or physics.

Course objectives

Students should familiarize themselves with the topics described below, so that they can show they know them thoroughly. While doing so, they will:

1. Learn to work with different types of functions;
2. Understand the concepts derivative and rate of change;
3. See some of the applications of the derivative;
4. Study exponential and logarithmic functions and their applications;
5. Complete the understanding of differentiation by learning about its counterpart, integration;
6. Be exposed to mathematical models for business and the physical and social sciences based on the definite integral;
7. Understand the importance and solution of the problem of finding an area between graphs of functions.

Course book and calculator

Larson, Ron & Edwards, Bruce H. Calculus. An Applied Approach. Houghton Mifflin, 6th edition.
The textbook and a scientific calculator must be brought to every class.

Assignments

The schedule below contains the homework exercises from the textbook that should be attempted. Except for classes with exams, there is homework for every class.

Grading System

There will be a continuous evaluation based on your participation, homework presented, exercises and examinations. See the semester schedule for more information. The following percentages indicate how the final grade is given:

<i>Homework, quizzes and class participation</i>	15%
<i>Test 1</i>	15%
<i>Test 2</i>	15%
<i>Test 3</i>	15%
<i>Test 4</i>	15%
<i>Final Exam</i>	25%

Each exam covers approximately one fourth of the course material. The final exam covers all course material and its questions are similar to questions in previous exams. In order to earn homework and class participation grade you must come prepared to class by having done the homework and engage during the class, for instance, solving problems on the board and participating actively in the proposed activities. There will be a short quiz daily with questions similar to homework problems for the day.

Attendance

All students are expected to come to every scheduled class. Not coming to a class generally implies not understanding the material presented that day. This is very difficult to recuperate and affects the understanding of the next class. *Unjustified absences beyond two will lower your grade according to the Madrid campus policy. Coming late to a class will be counted as an absence.*

The homework must be presented in the classroom the day it is due in order to earn credit for it. There will not be make-up exams. Missing an exam will always affect negatively your grade.

Course Outline

1. The derivative

The slope of a function at a point;

Rates of change;

The derivative;

Applications of rate of change in Business;

Derivative notations;

Differentiation rules;

Higher order derivatives;

Implicit differentiation;

Applications for Business, Economics and the Social Sciences.

2. Uses of the derivative

Increasing and decreasing functions;

Concavity;

Extreme points;

Inflection points;

Curve sketching;

Optimization;

Constraint optimization;

Practical applications;

Elasticity of demand.

3. Indefinite integrals

Antidifferentiation;

Marginal analysis;

Integration by substitution;

Integration by parts;

4. Definite integrals

Definite integrals and areas under curves;

The fundamental theorem of Calculus;

Areas between curves;

Practical applications;

Consumer's surplus and producer's surplus.