



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Mathematics

2324-1-F5602M001-F5602M001M

Learning objectives

The course is intended for students who wish to learn mathematical techniques suitable for economic analysis. The course aims at showing students how to apply a number of mathematical skills they require for a successful study of economics. A number of economic applications and models are presented.

Contents

Fundamental topics in mathematical economics

Detailed program

1 - Linear Algebra

1a) Vectors, Matrices and Systems of Linear Equation

1b) Determinants and the Inverse Matrices

1c) Vector spaces

1d) Eigenvalues and eigenvectors

2 - Quadratic forms

3 - Functions of several Variables

3a) Partial differentiation

3b) Concavity and Convexity

3c) Unconstrained and Constrained Optimization for Functions of several Variables: the method of Lagrange multipliers and the Kuhn-Tucker Conditions

- 3d) Comparative Statics
- 3e) The envelope theorem

4 - Difference Equations and Differential Equations

- 4a) Linear First Order Difference Equations
- 4b) Nonlinear First Order Difference Equations
- 4c) Systems of Difference Equations
- 4d) Introduction to Differential Equations

Prerequisites

Basic Real Analysis and Linear Algebra.

As a textbook, students might be willing to choose: *Essential Mathematics for Economics Analysis* - 6th edition - Knut Sydsæter, Peter Hammond, Arne Strom & Andrés Carvajal

Chapters to be reviewed are from the first to the ninth (Real Analysis), the twelfth and the thirteenth (Linear Algebra)

Teaching methods

In-class lectures

Assessment methods

A written exam covering lectures topics

Textbooks and Reading Materials

Lecture notes

- a) Sydsæter, K., Hammond, P., Seierstad, A., & Strom, A. - Further mathematics for economic analysis - Pearson education - second edition -2008
- b) Hoy M., Livernois J., McKenna C., Rees R., Stengos T. - Mathematics for Economics - The MIT Press - 2013

Semester

First semester

Teaching language

English

Sustainable Development Goals
