UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Mathematics

2425-1-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

3d) Comparative Statics
3e) The envelope theorem

4 - Difference Equations
4a) Linear First Order Difference Equations
4b) Nonlinear First Order Difference Equations
4c) Systems of Difference Equations
4d) discrete-time dynamical models for economic analysis

Prerequisites

Basic Real Analysis and Linear Algebra.

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

With respect to the fifth edition of this book, Chapters to be reviewed are from the first to the eight and the fifteenth

For all other editions, topics to be reviewed are:

- Essentials of Logic and Set Theory
- Algebra
- Solving Equations
- Functions of One Variable
- Properties of Functions
- Differentiation
- Derivatives in Use
- Single-Variable Optimization
- Matrix and Vector Algebra

Teaching methods

In-class lectures. No interactive activities are scheduled.

Assessment methods

A written exam covering lectures topics. The exam contains both theoretical questions and numerical exercises.

Textbooks and Reading Materials

Lecture notes

A book in digital format collecting selected chapters of books

https://www.egeaonline.it/ita/prodotti/metodi-quantitativi/mathematics-for-economics-and-business.aspx

https://www.egeaonline.it/ita/prodotti/metodi-quantitativi/dynamical-systems-and-optimal-control.aspx

is under preparation.

Its final link will be published here and posted through the course's elearningf webpage.

Semester

First semester

Teaching language

English

Sustainable Development Goals