Mathematics for Economics

Graduate School of Economics and Management (GSEM)

Syllabus

Academic Year: 2011/12

Instructors: Paola Ferretti; Diana Barro; Paolo Pellizari

http://www.venus.unive.it/ferretti/ (Ferretti)

http://www.dma.unive.it/~barro/ (Barro)

http://virgo.unive.it/paolop/index.html (Pellizari)

Objectives

This course is intended to deepen knowledge of students in (constrained) static optimization, as well as to provide some basic tools in dynamic optimization in discrete time. Other selected topics are treated, among those requested for further courses in macroeconomics, microeconomics, and game theory.

Requirements

Students are expected to be familiar with all the material presented in the preparatory course on Mathematics and to have submitted all (compulsory) homework assigned during the preparatory course.

Content of the course

- Constrained Optimization: Lagrange theorems, Kuhn-Tucker Theorem. (Paola Ferretti)
- Vector spaces and subspaces. Subspaces attached to a matrix. Normed spaces, contractions, Banach Theorem. (Paolo Pellizari)
- Dynamic optimization in discrete time: a glimpse on DEs; Bellman's Dynamic Programming; Pontryagin Maximum Principle. (Diana Barro)

Textbooks

[1] R.K. Sundaram (1996) *A first course in Optimization Theory*, Cambridge University.
[2] Carl P. Simon, Lawrence E. Blume, *Mathematics for Economists*, W.W. Norton & Company Press, Cambridge.
[3] K. Sydsaeter and P.J. Hammond, Seierstad, Strom, *Further Mathematics for Economic Analysis,* Prantice Hall.

Additional material shall be made available on the webpage of the course.

Exam

Written exam. Homework sets are proposed during the class.