Mathematics

Syllabus

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Objectives

This course is intended to review some concepts of linear algebra and calculus for several variables and develop the most important topics on unconstrained and constrained optimization.

Requirements

You are expected to be familiar with standard calculus in one variable.

Content of the course

Linear algebra: matrix algebra, determinants, rank, quadratic forms, sign of a quadratic form and definite matrices.
Calculus: functions of several variables, level sets, differential calculus for functions of several variables, convex functions.
Unconstrained optimization: first order optimality conditions, second order optimality conditions.
Constrained Optimization: the Weierstrass Theorem. Constrained optimization with equality constraints, Lagrange theorem. Lagrangian function and optimality conditions. Constrained optimization with inequality constraints, Kuhn-Tucker theorem. Convex problems.

Textbook

Carl P. Simon, Lawrence E. Blume, *Mathematics for Economists*, W.W. Norton & Company Press, Cambridge (1994).

Exam

Written exam. Intermediate tests are proposed during the course.