

# OPTIMIZATION FOR ECONOMICS

## Description

The goal of this course is to provide students with mathematical tools that are necessary for understanding modern economics, doing research or practical work. The object of study in this course—a problem of finding an optimal course of actions subject to feasibility constraints—appears in almost every subfield of economics, the theory of firm, consumption choice problem, macroeconomics, industrial organization, labor economics, just to name a few. The art of solving such problems, however, is usually “too applied” to find space in a purely mathematical curriculum. In this course, the emphasis will be put on the theory of constrained optimization but we aim to provide an integrated treatment that relates the mathematical theory to the economics.

During the lectures, the theory and mathematical background will be presented and typical problems will be solved.

## Prerequisites

The course syllabus assumes a good command of single variable calculus and linear algebra.

## Requirements

Formal course requirements include attendance of the lectures, a midterm and a final exam.

## Outline

1. Unconstrained optimization: necessary conditions and sufficient conditions for optima.
2. Constrained optimization: Lagrangean function and multiplier.
3. Comparative statics: maximum theorem, implicit function and its derivative, envelope theorem.

## Textbooks

*Mathematics for economists* by Simon and Blume.