**Aims**

The aim of the course is to introduce several optimization problems both from a more analytical side and a numerical/algorithmic perspective.

**Contents**

Theory of convex sets and functions

Unconstrained minimization problems

Constrained minimization problems

**Detailed program**
Theory of convex sets and functions: basic definitions and properties; relations with local extrema

Unconstreined minimization problems: basic setting; sufficient conditions for existence of minima;
characterization of local minima; line search methods; trust region methods

Constrained minimization problems: active sets; feasible directions; characterization of constrained minima;
Karush-Kuhn-Tucker conditions; linear programming

**Prerequisites**
Basic knowledge of mathematical analysis and linear algebra

**Teaching form**
Usual lecture room teaching.

**Textbook and teaching resource**
Teacher's notes available on demand
``Numerical Optimization'' by J. Nocedal and S. Wright

**Semester**
2nd Semester.

**Assessment method**
The exam consists in:
1) reading and understanding some assigned parts of the book ``Numerical Optimization'' by J. Nocedal and S. Wright not covered during the course;
2) prepare beamer slides on that topic (duration = 1/2 hour)
3) present the slides in front of the Professor and possible the other students of the course

**Office hours**
Email appointment.