

Microeconomics VI: Applied optimisation

Level: Bachelor, 3rd year

Cursus: Bachelor in Economics

Teaching hours: 18h (CM), 18h (TD)

Teachers: Richard BARON

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Course's objectives:

The objective of the course is to present optimization methods applied in economics, and in particular in microeconomics. In this course, the calculation of optimal solutions is performed by algorithms. Two types of optimization are studied: linear optimization and graph-based optimization. These methods are applied to optimization problems in micro-economics and management.

Course outline:

- Linear optimization
 - Linear optimization
 - Theory of linear programming
 - Simplex method
 - Dual formulation
- Graphs algorithms
 - Graph definition
 - Principle of dynamic programming
 - Application to optimal paths
 - Flow problems

Skills at the end of the course:

- Use different types of models in economics
- Formulate an optimization question under the form of a linear or graph optimization problem
- Solve a linear optimization problem using Simplex algorithm
- Solve a graph optimization problem
- Use Python programming language to solve numerically

Evaluation: Exams I and II.

Bibliography:

Understanding and using linear programming, B. Gartner, J. Matousek (2007)

Introduction to linear optimization, D. Bertsimas, J. Tsitsiklis (1997)

Graph, Networks and Algorithms, D. Jungnickel (2004)

Graph Theory and its applications, J.L. Gros, J. Yellen (2006)

Graph Theory and its applications to Problems of Society, F.S. Roberts