Optimization theory and applications

Niveau : *M1*
Cursus : *IP*
Semestre : S1
Volume horaire : 24 heures de cours (CM)
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Objectifs du cours :
This course focuses on the mathematical tools present in microeconomics and game theoretical models : through applications and general results, it investigates the structure of some solution concepts designed by optimization process.

Plan de cours :
The content is divided into two parts. The first part deals with convex optimization and presents the most well-known fixed point theorems in the continuous framework. The second part studies some aspects of optimization and fixed point theorems on lattice structure and supermodular functions, in view of applications in economics and game theory.

Compétences développées :
* Abstract and logical reasoning
* Formalization and modelling economics situations

Modalités d'évaluation :
One only final (written) exam will assess mathematical reasoning skills through proofs, based on the technical aspects taught in the two parts.

Prérequis (à mentionner uniquement s'il y en a) :
The mathematical aspects of this course are self-contained, but some common knowledge in microeconomics are useful to understand the motivation.

Bibliographie / références :
* Théorie des jeux et applications (V. Dequiedt, J. Durieu & P. Solal) : chapter 6 & Appendices
* Advanced Mathematical Economics (R.V. Vohra) : chapters 6 & 7
* Supermodularity and complementarity (D.M. Topkis) : chapter 2
* Monotone Games, A Unified Approach to Games with Strategic Complements and Substitutes (T. Sabarwal) : chapters 2, 3 & 4