



Faculté des sciences appliquées

FSA

INMA2415 **COMPUTATION OF ECONOMIC EQUILIBRIA**

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s): Yves Smeers
Language: french
Level: 2nd cycle course

Aims

Training in the formulation, analysis and solution of economic equilibrium models

Main themes

Presentation of various types of economic equilibrium, alternative formulations and most important solution methods.

Content and teaching methods

1. Types of economic equilibrium

Partial and general equilibrium, Nash equilibrium, equilibrium on networks, multilevel equilibrium

2. Illustrations and applications

General equilibrium, models of imperfectly competitive markets, models of network industries (energy, transport, telecommunication), multilevel equilibrium (Stackelberg, hierarchical programming, principal/agent, optimisation subject to equilibrium problems, equilibrium problems subject to equilibrium constraints)

3. Formulation of equilibrium problems

Optimisation, Fixed-point formation, Linear and nonlinear complementarity problems, Variational inequality problems

4. Solution techniques

Differentiable methods: the problem is replaced by sequences of simpler variational inequality or complementarity problems: Interior point methods for complementarity problems, non-differentiable techniques, multilevel techniques.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

The material is presented through small examples together with their economic interpretation. A linear programming course is a prerequisite.

Other credits in programs

ECGE3DS/SC	Diplôme d'études spécialisées en économie et gestion (Master in business administration) (Supply Chain Management)	(5 credits)
MAP22	Deuxième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)
MAP23	Troisième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)