MICROECONOMICS II:

An introduction to game theory and general equilibrium

Winter 2006

Textbooks

- **Fudenberg and Tirole.** *Game Theory*, The MIT Press 1991.
- **Osborne and Rubintein.** *A Course in Game Theory*, The MIT Press 1994.
- **Vega-Redondo.** *Economics and the Theory of Games*, Cambridge University Press 2002.
- **Hildenbrand and Kirman.** *Equilibrium Analysis.* North-Holland, 1988.
- **Starr.** *General Equilibrium Theory: An Introduction*, New York: Cambridge University Press, 1997.
- **Mas-Colell, Whinston and Green**, *Microeconomic Theory,* Oxford 1995.

Aims and Scope

The objective of this course is the analysis of how individuals (optimal) decisions interact between themselves. In this sense, it is a fitting continuation of Microeconomics I, which studied individual decision-making. The first part of the course is devoted to game theory and the second to general equilibrium. The main difference is that in game theory an individual has a noticeable impact on the aggregate outcome, whereas in general equilibrium a single decision-maker cannot affect the aggregate situation.

Approximate schedule (by weeks)

1. Preliminaries.

Definitions of a game: players, strategies and payoffs.
Representing a game: the strategic form and the extensive form.
Strict and weak dominance: prisoners' dilemma, the beauty contest.

2. Nash equilibrium.

Existence: fixed point theorems.
Nash equilibrium as a positive analysis tool: oligopoly.
Nash equilibrium as a normative analysis tool: implementation.

3. Subgame perfect equilibrium.

Incredible threats and small irrationalities.
Subgame perfect equilibrium as a positive analysis tool: bargaining.
Subgame perfect equilibrium as a normative analysis tool: King Solomon's dilemma.

4. Incomplete information.

Bayesian-Nash equilibrium.

Bayesian-Nash equilibrium as a positive-normative analysis tool: Auctions.

5. Dynamic games.

Folk theorems: repeated games between patient players.
Dynamic games of incomplete information: signalling and Bayesian-perfection.

6. The economic environment of General Equilibrium Theory.

Agents and preferences, the budget set, demand and excess demand functions.
Technological limits: production sets.

7. The concept of Walrasian price taking equilibrium.

Definition. Walsarian Equilibrium as a type of Nash equilibrium. Fixed points revisited. An equilibrium existence Theorem. The futile search for uniqueness.

8. The Welfare Properties of Walrasian Equilibrium.

Under a complete market hypothesis, a Walrasian equilibrium is Pareto optimal.
Under convexity hypothesis any Pareto optimal allocation can be made Walrasian. A related result: the core equivalence theorem.

9. Market Failure.

Externalities. Market Incompleteness.

10. Beyond Walrasian Theory: back to games.

The role of non-convexities, particularly of increasing returns.