

12C004

3 ECTS

Introduction to Game Theory

Overview and Objectives

This course aims to give students an introduction to Game Theory and its applications to different fields of economics. Game theory analyzes the strategic interaction between decision makers and consequently it is crucial for understanding most of today's research in economics. Every Topic will have two parts: i) A "formal" introduction to an equilibrium concept of game theory, ii) detailed description of several economic applications related with this equilibrium concept.

Course Outline

Introduction

Topic 1: Strategic Games with Perfect Information

- Content: strategic games; best response; dominated strategies; dominant strategies; rationalizable strategies; Nash equilibrium; mixed strategies.
- Applications: Bertrand and Cournot competition, auctions, electoral competition, externalities, etc.
- Reading: Gibbons Ch 1; Harrington Ch 3-7; Osborne Ch 2-4.

Topic 2: Extensive Games with Perfect Information

- Content: game tree; strategies and outcomes; backward induction; strategic form representation and Nash equilibrium of extensive games; credibility; subgames; subgame perfect Nash equilibrium.
- Applications: ultimatum game; Stackelberg competition; bargaining, etc.
- Reading: Gibbons Ch 2; Harrington Ch 2,8; Osborne Ch 5-7,16.

Topic 3: Repeated Games

- Content: stage game; finite and infinite repetition; trigger strategies; tit-for-tat; folk theorem; cooperative behavior.
- Applications: collusion; credibility of monetary policy; bonus; reputation versus regulation, etc.
- Reading: Gibbons Ch 2; Harrington Ch 13-14; Osborne Ch 14-15.

Required Activities

The course will be mainly based on lecture slides and three problems sets.

Evaluation

Final exam (80%), Problem sets (20%)

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Materials

The course is mainly based on lecture slides and three problems sets. Students can consult a wide range of text books on game theory. However, it is recommended to focus on the slides and the following references:

- Gibbons, R. (1992), *Game Theory for Applied Economists*, Princeton University Press.
- Harrington J. (2009), *Games, Strategies, and Decision Making*, Worth Publishers.
- Osborne, M. (2004), *An Introduction to Game Theory*, Oxford University Press.