# Microeconomic Theory II

Central European University
Department of Economics
Academic Year 2016/2017

Lecturer: **Andrzej Baniak**
Nador 11 Building, Room 410
E-mail: baniaka@ceu.hu

## General Information

**Course level:** This is the compulsory core course for first year students of MA in Economics

**Credits:** 4 credits (8 ECTS credits)

**Time:** Winter Semester

## General Description

The purpose of this course is to present some topics which are part of the core of modern microeconomics, namely elements of game theory and topics in information economics. The course is a continuation of the Microeconomic Theory I course. During the course both rigour and intuition will be emphasized.

## Goals of the Course

Main goal of the course is to present the main ideas and models of the most important parts of modern microeconomic theory: game theory and contract theory. Those ideas and models form now a standard methodology in economic theory and are used again and again in all fields in economics. Henceforth, this course will provide students with a solid foundation for more topical courses like industrial organization, labour economics, public finance, corporate finance, law and economics, international trade and so on.

## Learning Outcomes

Successful completion of the course enables students to

- Understand how mathematical methods and rigorous analysis are used to formalize economic concepts and ideas.
- Posses a critical understanding of modern microeconomic theory at the introductory graduate-level of difficulty.
- Be able to set up and solve mathematical models describing specific economic problems at the introductory level of difficulty.
- Understand and formalize the inefficiencies arising from non-competitive market structures.
- Understand and formalize strategic interaction of economic agents.

- Understand and formalize the inefficiencies arising from asymmetric information distribution between economic agents.

### Course Requirements and Assessment

There will be eight homework assignments and the final exam. Homework assignments will consist of problems similar to those that you will encounter on the exams. While you should tackle the assigned problems first on your own, you are encouraged to discuss them with your fellow classmates. Moreover, students can form groups at most of three people to solve problems. Every group can handle one copy of the homework assignment. Solutions to the homework assignments will be graded. Selected solutions will be presented during the seminars. The final exam will cover material of the entire course. The course grade will depend on the homework and exam scores:
Homework assignments: up to 30%
Final exam: at least 70%.

### Main textbooks

During the course we will use mainly the following textbooks:

- **Gibbons, Robert**, *A Primer in Game Theory*, New York: Harvester Wheatsheaf, 1992.
- **Tadelis, Steven**, *Game Theory: An Introduction*, Princeton and Oxford: Princeton University Press, 2013.
- **Salanié, Bernard**, *The Economics of Contracts. A Primer*, Cambridge, Mass.: MIT Press, 1997.

Additionally, we will use material from:

- **Varian, Hal**, *Microeconomic Analysis*, New York: W.W. Norton, 1992.
- **Hal Varian**, *Intermediate Microeconomics: A Modern Approach, 8th. ed.*, New York: W.W. Norton, 2010.
- **Mas-Collel, Andreu, Michael D. Whinston, and Jerry R. Green**, *Microeconomic Theory*, New York: Oxford Univ. Press, 1995.
- **Fudenberg, Drew and Jean Tirole**, *Game Theory*, Cambridge, Mass.: MIT Press, 1995.
- **Osborne, Martin J.**, *An Introduction to Game Theory*, Oxford: Oxford Univ. Press, 2004.
- **Bolton, Patrick and Mathias Dewatripont**, *Contract Theory*, Cambridge, Mass.: MIT Press, 2005.

## Detailed course outline and reading list

Positions marked by (*) are optional.

### I Elements of Game Theory

- **Static Games of Complete Information:** normal-form representation of the game, dominant strategies, iterated strict dominance, Nash equilibrium in pure and mixed strategies. Application: Cournot and Bertrand equilibrium in oligopoly.
  Gibbons (1992), ch. 1; Tadelis (2013), chs. 3-6; (*)Fudenberg and Tirole (1995), 1.1-1.3; (*)Osborne (2004) ch. 1-4.

- **Dynamic Games of Complete Information:** extensive-form representation of games, backward induction, subgame-perfect Nash equilibrium. Application: Hotelling model with advertising.
  Gibbons (1992), ch. 2; Tadelis (2013), chs. 7-8; Fudenberg and Tirole (1995) ch. 3.5, 3.6; (*)Osborne (2004) ch. 5.

- **Repeated Games and Folk Theorem:** finitely repeated Prisoner's Dilemma game, infinitely repeated games, Folk Theorem. Application: collusion between Cournot duopolists.
  Gibbons (1992), ch. 2; Tadelis (2013), chs. 9-10; Fudenberg and Tirole (1995) ch. 5.1, 5.2; (*)Osborne (2004) ch. 14.

- **Static Games with Incomplete Information:** Conditional Expected Utility, Bayesian-Nash equilibrium. Application: First- price and second-price sealed bid auctions
  Gibbons (1992) ch. 3.1, 3.2; Tadelis (2013), chs. 12-13; (*)Fudenberg and Tirole (1995) ch. 6.1-6.5; (*)Osborne (2004) ch. 9.; (*)Varian (2010) ch. 17.

### II Topics in General Equilibrium: Public goods and Commons

- Efficient provision of public good, private provision of public good, Lindahl allocations, voting equilibrium, the Groves-Clarke mechanism, Commons
  Varian (1992) ch. 23; (*)Varian (2010) ch. 36; (*) Tadelis (2013), ch. 14;

### III Topics in economics of information

- **Adverse selection:** Akerlof models of lemons market and labor market; collapse of the market
  Salanié (1997), ch. 1, 4.1; Mas-Collel et al. (1995), ch. 13.B; Akerlof (1970); (*) Varian (1992) ch. 25.9; (*)Varian (2010) ch. 37.

- **Models of hidden information:** Principal-Agent Approach, Monopolistic screening
  Salanié (1997), ch. 2; (*)Macho-Stadler and Pérez-Castrillo (1997), ch. 4.1, 4.2; (*)Laffont and Martimort (2002), ch. 2; (*)Bolton and Dewatripont (2005), ch. 2.

- **Moral hazard:** Simple model with two effort levels, moral hazard in teams. Applications: credit rationing, incentive contracts

Salanié (1997) ch. 5.1; Varian (1992) ch. 25.4; Milgrom and Roberts (1992), p. 166-170; (*)Laffont and Martimort (2002), ch. 4; (*)Holmstrom (1982); (*)Bolton and Dewatripont (2005), ch. 4.

- **Signalling and Communication Games:** Introduction to Perfect Bayesian Equilibrium, Signalling games, Applications: Spence's education model, cheap talk games
  Gibbons (1992), ch. 4.1, 4.2.A, 42.B; Mas-Collel et al. (1995), ch. 13.C; Osborne (2004) ch. 10.8 ; Tadelis (2013), chs. 15-16; (*)Bolton and Dewatripont (2005), ch. 3; (*)Crawford and Sobel (1982).

## References

**Akerlof, George A.**, "The market of lemons: quality uncertainty and the market mechanism," *Quarterly Journal of Economics*, 1970, pp. 488–500.

**Bolton, Patrick and Mathias Dewatripont**, *Contract Theory*, Cambridge, Mass.: MIT Press, 2005.

**Crawford, Vincent P. and Joel Sobel**, "Strategic Information Transmission," *Econometrica*, 1982, *50* (6), 1431–1451.

**Fudenberg, Drew and Jean Tirole**, *Game Theory*, Cambridge, Mass.: MIT Press, 1995.

**Gibbons, Robert**, *A Primer in Game Theory*, New York: Harvester Wheatsheaf, 1992.

**Holmstrom, Bengt**, "Moral Hazard in Teams," *The Bell Journal of Economics*, 1982, *13* (2), 324–340.

**Laffont, Jean-Jacques**, *Fundamentals of Public Economics*, Cambridge, Mass.: MIT Press, 1988.

_ **and David Martimort**, *The theory of incentives; the principal-agent model*, Princeton: Princeton Univ. Press, 2002.

**Macho-Stadler, Inés and J.David Pérez-Castrillo**, *An introduction to economics of information: incentives and contracts*, Oxford: Oxford Univ. Press, 1997.

**Mas-Collel, Andreu, Michael D. Whinston, and Jerry R. Green**, *Microeconomic Theory*, New York: Oxford Univ. Press, 1995.

**Milgrom, Paul and John Roberts**, *Economics, Organization and Management*, Prentice Hall, 1992.

**Osborne, Martin J.**, *An Introduction to Game Theory*, Oxford: Oxford Univ. Press, 2004.

**Salanié, Bernard**, *The Economics of Contracts. A Primer*, Cambridge, Mass.: MIT Press, 1997.

**Tadelis, Steven**, *Game Theory: An Introduction*, Princeton and Oxford: Princeton University Press, 2013.

**Varian, Hal R.**, *Microeconomic Analysis*, New York: W.W. Norton, 1992.

_ , "A Solution to the Problem of Externalities when Agents are Well-Informed," *American Economic Review*, 1994, *84* (5), 1278–93.

_ , *Intermediate Microeconomics: A Modern Approach, 8th ed.*, New York: W.W. Norton, 2010.