

SYLLABUS FOR MICROECONOMICS

The course spans the whole year. The final grade for first-year Microeconomics will be computed as the average of the grades obtained in each of the two semesters. Please note that the final exam in June will not be cumulative (it will cover topics from the second semester only).

FIRST SEMESTER

Lecturers: Anna Yurko

Class Teachers: Anna Yurko

Course Description

Microeconomics I is the first part of the two-semester graduate-level course which provides a rigorous treatment of microeconomic theory and its applications. We first study the decisions of individual economic agents, beginning with the theory of consumer choice and the producer theory. We introduce the concept of duality and analyze it in the context of consumption and production decisions. Afterwards, we study decision-making under uncertainty and introduce the expected utility theory. We also discuss its critiques. The course proceeds with the study of competitive equilibrium and its welfare properties in a general equilibrium setting.

Teaching Objectives

The objective of the course is to provide the students with a thorough knowledge and understanding of the foundations of modern economic analysis. The students will be introduced to the classical results and recent developments in microeconomic theory but the main focus will be on developing their modeling skills and encouraging them to think analytically about real-world phenomena.

Prerequisites:

Intermediate Microeconomics, Calculus, Linear Algebra, Probability

Teaching Methods

Lectures, discussions, and problem-solving sessions.

Grade determination

The students should regularly hand in assignments selected problems of which will be discussed in class. The grade will be based on the final exam (55%), a midterm exam (35%), homeworks (5%), and class attendance (5%).

Main reading

- Varian, Hall (1992): *Microeconomic Analysis, Third Edition*, W. W. Norton & Company, Inc, New York.
- Mas-Colell, Andreu, Whinston, Michael and Jerry Green (1995): *Microeconomic Theory*, Oxford University Press, Oxford, New York.
- Gibbons, Robert (1992): *Game theory for Applied Economists*, Princeton University Press, Princeton, New Jersey.

Varian (1992) [hereafter, V] is the main book of the course. Mas-Colell et al. (1995) [hereafter, MWG] is more formal but less intuitive than V and may be consulted by the more technically inclined.

Additional reading

- Simon, Carl and Lawrence Blume (1994): *Mathematics for Economists*, W. W. Norton & Company.
- Kreps, David (1990): *A Course in Microeconomic Theory*, Princeton University Press, Princeton, New Jersey.
- Rubinstein, Ariel (2006): *Lecture Notes in Microeconomic Theory*, Princeton University Press, Princeton and Oxford, <http://arielrubinstein.tau.ac.il/Rubinstein2007.pdf>

Simon and Blume (1994) is an excellent reference book for the mathematical tools used in this course. Kreps (1990) is a more intuitive textbook on microeconomic theory than MWG and can also be used to study the material. Rubinstein (2006) is available on-line; it is based on Rubenstein's lecture notes for the graduate-level microeconomics course. The book provides good intuition and thorough treatment of the following topics: consumer choice, producer theory and choice under uncertainty.

Course outline

[Required readings are marked by an asterisk (*)]

1. Consumer Choice Theory (5 lectures, 3 seminars)

This chapter studies in detail the individual decisions of consumers. First, we consider individual decision making in an abstract setting: the preference-based vs. the choice-based approach. Then, we focus on the optimal decisions of individual consumers. We derive individual demands and work out their properties. We further discuss the duality of utility maximization and expenditure minimization, study the problem of integrability, and analyze the relation between the earlier results and the choice-based approach. We conclude with the issues of demand aggregation.

- V, Chapters 7-10.*
- MWG, Chapters 1-4.*
- Rubinstein (2006), Lectures 1-6.
- **Simon and Blume (1994)**, Chapters 16-21.

2. **Producer Theory (3 lectures, 1 seminar)**

This part of the course studies the behavior of the firm and develops a theory parallel to the theory consumption analyzed earlier. We study profit maximization and cost minimization, work out the properties of firm's supply, discuss efficiency in production. The chapter finishes with supply aggregation.

- V, Chapters 1-6, 13.3.*
- MWG, Chapter 5.*
- Rubinstein (2006), Lecture 7.

3. **Choice Under Uncertainty (4 lectures, 2 seminars)**

We start by learning how to represent risky alternatives by means of lotteries. Then, by imposing rationality, continuity, and independence on individual preferences we obtain a central result known as the expected utility theorem. We analyze the attitude of different individuals towards risk and discuss some classical measures of risk aversion. We then move to comparing alternative distributions of monetary returns in terms of stochastic dominance. We consider the limitations of the expected utility theory and we provide Savage's foundation for subjective expected utility theorem. Violations of Savage axioms lead to a brief discussion of Ellsberg's paradox and ambiguity aversion.

- MWG, Chapter 6 (A-D). *
- Handout on savage axioms. *
- Rubinstein (2006), Lectures 8-9.

4. **General Equilibrium (4 lectures, 2 seminars)**

In this part of the course we consider a competitive market economy in a general equilibrium setting. We formally introduce the notions of Pareto optimality and competitive (or Walrasian) equilibrium and analyze their interrelation summarized in the two fundamental theorems of welfare economics. We study in detail the 2 by 2 exchange economy model and the 2 by 2 (two products, two factors) production economy model.

- MWG, Chapters 15 (A-D), 16 (C), 17 (A-B), 19 (A-D). *

Distribution of hours

№	Topic	Total (hours)	Contact hours		Self-study
			Lec-tures	Semi-nars	
1.	Consumer Choice Theory	36	10	6	20
2.	Producer Theory	20	6	2	12
3.	Choice under Uncertainty	27	8	4	15
4.	General Equilibrium	27	8	4	15
	Total:	110	32	16	62

Syllabus for Microeconomics - 2nd semester

Class and seminar teacher: Emiliano Catonini

1 Course Description

This course consists of two parts: the first one is devoted to introduction to game theory, the second focuses on topics in contract theory. Game-theoretical part covers static and dynamic games, both of complete and incomplete information. We go over game-theoretical applications in industrial organization, auctions and labour markets. The second part of the course focuses on contract theory and builds up on the concepts studied in the first part. A general principal-agent framework is set up and all the applications are derived using the same approach. We cover various modifications of adverse selection and moral hazard problems.

2 Teaching Objectives

The objective of the course is to provide students with thorough and rigorous understanding of the concepts of game theory and contract theory. At the end of the course students are expected to be fluent in application of this concepts to the analysis of economic problems.

3 Literature

1. Osborne, Rubinstein, "A course in Game Theory", The MIT Press (1994)
2. Salanie, B. "The Economics of Contracts" 2nd ed., The MIT Press (2005).
3. Laffont J.-J. and D. Martimort "The Theory of Incentives" Princeton University Press (2002).
4. Bolton, P. and M. Dewatripont "Contract Theory", The MIT Press (2005).
5. Krishna, V. "Auction Theory" 2nd ed. Elsevier (2010).
6. Mas-Colell, Whinston and Green "Microeconomic Theory", Oxford University Press (1995).

4 Grading

Let F be final grade, E – exam grade, M – midterm grade and H – homeworks.

Then: $F = 0.5E + 0.45M + 0.05H$

5 Program and hours (total 120)

1. Static games of complete info (lectures 4, seminars 2, self-study 8):
 - Dominance and rationalizability
 - Nash equilibrium in pure and mixed strategies
2. Static games of incomplete info (lectures 4, seminar 2, self-study 8):
 - Bayesian equilibrium.
 - Auctions.
3. Dynamic games of complete info (lectures 4, seminar 2, self-study 8):
 - Subgame perfect equilibrium
 - Repeated games
4. Dynamic games of incomplete info (lectures 4, seminar 2, self-study 8):
 - Perfect Bayesian Equilibrium.
 - Spence model, Cheap-talk model.
5. Adverse Selection (lectures 4, seminar 2, self-study 10):
 - Baseline model of adverse selection: first-best and second-best.
 - Shutdown and pooling contracts, Applications to financial contracts.
6. Advanced topics in adverse selection (lectures 4, seminar 2, self-study 10):
 - Ex ante contracting with limited liability. Contracts with audit.
 - Contracts with different outside options. Continuum of types.
7. Moral Hazard (lectures 4, seminar 2, self-study 10):
 - Baseline model of moral hazard: observable and unobservable effort, risk-neutral and risk-averse agents.
 - Multiple outcomes. Continuum of outcomes.
8. Advanced topics in moral hazard (lectures 4, seminar 2, self-study 10):
 - Linear contracts.
 - Multitasking. Relational contracts.