Universidad Carlos III de Madrid

Master in Economic Analysis

Microeconomics II

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December 2, 2021

1 Summary of the Course

Microeconomic theory is a set of consistent assumptions that aim to provide a systematic and realistic model of decision making for economic agents, and to use this framework to analyze socio-economic situations such as decision under fundamental and strategic uncertainty, markets, bargaining, oligopolistic competitions, or collective decision problems. The course Microeconomic II introduces the fundamental tools that are needed for the analysis of strategic situations. By strategic situations, we mean economic environments in which the optimal decision for one agent depend on what she expects other agents will do.

2 Prerequisites

A background in Microeconomics is necessary. On top of that, the student needs to have an appreciation for mathematical modeling in the social sciences.

3 Course Organization and Timeline

This course is a thirteen week course, with two lectures of 1h30 and one practical class of 1h30 per week. On top of these thirteen weeks of courses, around the middle of the semester, there is one week (around the middle of the semester) without classes during which the midterm exams take place, and an additional week (the second week after the last week of class) in which the final exam takes place. I detail below the list of topics that we shall cover during each week.

3.1 Decision under uncertainty (week 1)

1. The Von Neuman-Morgestern model of decision under risk
2. The Savage model of decision under uncertainty

3.2 Market failures and externalities (week 2 to 4)

1. Determination of the Walrasian demand correspondences with externalities
2. Determination of the partial and general equilibrium with externalities

3. Unilateral externalities

4. Multilateral externalities

5. Solutions to the externality problems:

   (a) The Coase theorem

   (b) Quotas

   (c) Pigouvian Taxes

6. Public goods and the neutrality theorem

3.2.1 Homework on externalities

- 1. Homework 1a (unilateral externality with one culprit and one victim) due on week 1

- Homework 1b (unilateral externality with one culprit and one victim, Pigouvian tax) due on week 2

- Homework 2 (unilateral externality with one culprit and many victims, market for pollution permits) due on week 3

- Homework 3 (public good) due on week 4

- Homework 4 (production externality) due on week 5

3.3 Static Game Theory with Complete Information (weeks 5 to 8)

1. Definition and normal form representation of games

2. Static solution concepts for games of perfect information: dominant strategies, weakly dominant strategies, rationalizable strategies, and Nash equilibrium.

3. Applications of static game theory:

   (a) Oligopolistic competition and market power: Cournot competition, Betrand competition

(b) Competitive bidding in auctions

(c) Strategic models of politics: Downsian electoral competition, voting games

4. Supermodular games and their applications

3.3.1 Homework on Static Game Theory with Complete Information

- Homework 5 (strict dominance, weak dominance, rationalizability) due on week 6
- Homework 6 (mixed strategies) due on week 8

3.4 Dynamic Game Theory with Complete Information (weeks 9 to 11)

1. Definition and extensive form representation of dynamic games
2. Dynamic solution concepts for games of perfect information: sequential rationality
3. Applications of dynamic game theory with perfect information:

   (a) Oligopolistic competition and market power: strategic entry, Stackelberg competition, sequential price competition

   (b) Bilateral bargaining: the Rubinstein model of alternating offers

4. Dynamic solution concepts for games of imperfect information: subgame perfect Nash equilibrium.
5. Applications of dynamic game theory with imperfect information:

   (a) Models of war of attrition.

   (b) Sequential voting procedures with amendments

   (c) Multistage games, repeated games, and self enforcing cooperation.

3.4.1 Homework on Dynamic Game Theory with Complete Information

- Homework 7 (dynamic games of complete & perfect information and finite horizon) due on week 10

- Homework 8 (dynamic games of complete & perfect information and infinite horizon) due on week 11
- Homework 9 (dynamic games of complete but imperfect information, multistage games) due on week 12

3.5 Static game theory with incomplete information (weeks 12 & 13)

1. Definition and representation of static games of incomplete information: the Harsanyi representation
2. Static solution concepts for games with incomplete information: Bayesian Nash equilibrium
3. Applications.
   (a) Oligopolistic competition: strategic entry with asymmetric information
   (b) Competitive bidding in auctions with private information
   (c) Bargaining with asymmetric information and the lemon problem

3.5.1 Homework on Dynamic Game Theory with Incomplete Information

- Homework 10 (Auction) due on week 13

4 Faculty

- Lecturer: Antoine LOEPER
- Room: 15.2.17
- Email: aloeper@eco.ecu3m.es
- Phone: 916 24 5738
- Office hours: TBA
- Teaching Assistant: TBA

5 Grading

The final grade will be based on a midterm (about 30%) and a final exam (about 60%), and weekly homework (10%).

6 Bibliography

I will send you my own detailed lecture notes for the course. You can complement them with a textbook. The textbook closest to mt lecture notes is probably "Introduction to Game Theory" by Steven tadelis, but "Microeconomic Theory" by Mas-Colell et al. (1995) is also helpful, incase you have already bought it for previous courses.