

# UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

# **COURSE SYLLABUS**

# **Games and Strategic Behaviour**

2324-2-F5105P016

# Learning objectives

This course is an introduction to topics in APPLIED game theory. Its objective is to equip the students with tools essential to study economics of information and of strategic behaviour and for setting up and solving a wide range of economic problems, both micro and macro.

#### **Contents**

- 1. rational behavior both under certainty and under uncertainty
- 2. game representations: extensive form, strategic form and Bayesian games
- 3. Nash equilibria and refinements in extensive form, with applications
- 4. Nash equilibria and refinements in strategic form, with applications
- 5. Bargaining models and applications

#### **Detailed program**

- 1. Presentation of the course and utility maximization
- 2. 2. Set 1 of Experiment

- 3. Rational Behavior under Uncertainty
- 4. Set 1 of exercises
- 5. Discussion of Experiment and Solution of Set 1 of Exercises
- 6. Extensive Form Games-1
- 7. Set 2 of Experiment
- 8. Discussion of Experiment
- 9. Extensive Form Games-2
- 10. Strategic Forms Games
- 11. Set 2 of exercises
- 12. Set 3 of Experiment
- 13. Solution of set 2 of exercises
- 14. Discussion of set 3 of experiment
- 15. Bayesian Games
- 16. Dominance: strict and weak, iterated
- 17. Bayesian Rationality and Rationalizability
- 18. Set 3 of exercises
- 19. Solutions of set 3 of exercises
- 20. Nash and Bayes Nash Equilibria
- 21. Set 4 of experiment
- 22. Discussion set 4 of Experiment
- 23. Calculation of Nash Equilibria
- 24. Application of Nash and Bayes Nash Equilibria
- 25. Set 4 of Exercises
- 26. Solution of Set 4 of Exercises
- 27. Equilibria in extensive form games
- 28. Sequential rationality in imperfect information games
- 29. Set 5 of Experiment
- 30. Discussion of set 5 of Experiment

- 31. Weak Perfect Bayesian Equilibria
- 32. Set 5 of Exercises
- 33. Sequential Equilibria
- 34. Solution of set 5 of Exercises
- 35. Refinements of Sequential Equilibria 1
- 36. Refinements of Sequential equilibria and applications
- 37. Set 6 of Exercises
- 38. Sequential Equilibria and signaling games 1
- 39. Sequential Equilibria and signaling games 2
- 40. Applications of Signaling Games
- 41. Set 7 of Exercises
- 42. Bargaining Theory 1
- 43. Bargaining Theory 2
- 44. Set 8 of Exercises
- 45. Students' presentations
- 46. Review and mock exam

# **Prerequisites**

Basic economics and mathematics

# **Teaching methods**

Lectures, exercises, on line experiments and students' group presentations

#### **Assessment methods**

There are two assessment methods, for attending and non attending students.

For attending students the final evaluation is the average between

- 1. a short students' paper based on different possible topics, so that the students experiment reading, understanding a presenting research in game theory
- 2. three homework, to practice the concept presented in the lectures
- 3. a final written examination consisting of an exercise to test the students' capability of solving specific game theory models.

For non attending students the final evaluation will be based on a written examination .to test the students' capability of solving specific game theory models.

The students are strongly suggested to attend the course.

# **Textbooks and Reading Materials**

- 1. Jurgen Eichberger, Game Theory for Economists, Academic Press, 1993.
- 2. P. K. Dutta, Strategies and Games, The MIT Press, 1999 = D.
- 3. H. S. Bierman L. Fernandez, Game Theory with Economic Applications, Addison Wesley Publishing Company, 1993 = B-F.
- 4. Lecture notes
- 5. Original papers

#### Semester

First semester

#### **Teaching language**

English

#### **Sustainable Development Goals**

**REDUCED INEQUALITIES**