Collegio Carlo Alberto

Game Theory

Spring 2022

Dino Gerardi

Class Time: Monday 16:00 - 18:00 and Thursday 17:30 - 19:30

Office Hours: by appointment (dino.gerardi@carloalberto.org)

Grades

The grades will be determined as follows: midterm 40%, final exam 60%.
There will be problem sets about once a week. The midterm will be on Monday, March 21st.

Course Textbooks

- Martin J. Osborne and Ariel Rubinstein: *An Course in Game Theory*, The MIT Press.
- Martin J. Osborne: *An Introduction to Game Theory*, Oxford University Press.
- Roger B. Myerson: *Game Theory*, Harvard University Press.
- Macho Stadler and Perez Castillo: *An Introduction to the Economics of Information*, Oxford University Press, 2001, 2nd edition.
- Mas-Collel, Whinston and Green: *Microeconomic Theory*, Oxford University Press.

Outline

The course will provide a mathematical treatment of choice under uncertainty and game theory. We will develop and solve formal models of strategic interactions among economic agents. We will consider several economic applications, such as imperfect competition, auctions, public goods and bargaining.

I. Introduction.

II. Decision Theory.
Dominance, beliefs and "Never Weak Best Response" strategies.

III. Strategic Form Games
Dominance, Nash equilibrium, mixed strategies.

IV. Extensive Form Games
Corresponding strategic forms, behavioral strategies, backwards induction, subgame perfect equilibrium.

V. Games of Incomplete Information
Normal-form representation of static games of incomplete information, Bayesian Nash equilibrium, perfect Bayesian equilibrium.

VI. Repeated Games
Folk theorems.

VII. Mechanism Design
Design of the optimal auction, the revenue equivalence theorem.