

The International College of Economics and Finance Syllabus for Game Theory

Lecturer: Emiliano Catonini (emiliano.catonini@gmail.com)

Class teacher: Emiliano Catonini

Course description and objectives:

The goals of the course are:

- 1- to acquire the game theoretical tools most widespread in economic applications;
- 2- to understand their theoretical motivations and underlying assumptions in terms of players' strategic reasoning.

Course prerequisites:

The only prerequisite for the course is the basic knowledge of probability theory and optimization theory. Both topics are treated in the ICEF BSc mandatory courses of the first two and a half years.

After the course:

In the fourth year, students are recommended to attend courses where game theory is the main modeling technique. These courses include, for instance, Contract Theory and Industrial Economics. Both these courses endow students with the necessary skills for strategic and economic consultancy, and for institutions that operate in the regulations of markets.

Course topics:

- **Simultaneous games with complete information (8 hours lectures, 8 hours classes):** best replies, dominance, rationalizability, iterated dominance, nash equilibrium, mixed eq., correlated eq.

Main application: oligopolies.

- **Simultaneous games with incomplete information (6,6):** ex-ante strategic form, interim strategic form, bayesian games, bayesian equilibrium.

Main application: auctions, juries.

- **Dynamic games with complete information (8,8):** perfect information, backward and forward induction, observable actions, subgame perfect equilibrium, repeated games.

Main application: collusion, bargaining.

- **Dynamic games with incomplete information (6,6):** bayesian updating, perfect bayesian eq.

Main application: signaling games, cheap talk games, persuasion.

The methods:

The following methods and forms of study are used in the course:

- theoretical lectures (2 hours a week): presentation with slides and explanation of the main game theoretical models and related solution concepts;
- practise classes (2 hours a week): solution of exercises at the whiteboard, partly drawn from applications, which will be distributed one week in advance for self-practise;
- office hours: to be determined according to the students' schedule.
- self-study.

In total the course includes: 28 hours of lectures, 28 hours of classes.

Main readings:

The slides of the lectures will be provided (beforehand) to the students.

The main complementary reading is the book “A Course in Game Theory”, by Martin J. Osborne and Ariel Rubinstein. More specific references of the covered parts will be provided. The book can be downloaded for free at: <http://books.osborne.economics.utoronto.ca/>

Grade determination:

Final grade (/100) = First test * 0.25 + Second Test * 0.25 + Final Exam grade * 0.5.

The first and second test cover respectively the first and the second part of the program. The final exam covers the third and the fourth parts of the program.