Game Theory (Tréorie des jeux)

Course title - Intitulé du cours	Game Theory – Théorie des jeux
Level / Semester - Niveau /semestre	M1 / S1
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	Bertrand GOBILLARD
Other teacher(s) - Autre(s) enseignant(s)	Alex Smolin
Other teacher(s) - Autre(s) enseignant(s)	
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Lecture Hours - Volume Horaire CM	30
TA Hours - Volume horaire TD	12
TP Hours - Volume horaire TP	0
Course Language - Langue du cours	English (international track) French (standard track)
TA and/or TP Language - Langue des TD et/ou TP	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

Bertrand Gobillard (bertrand.gobillard@tse-fr.eu, office MS 103)

Alex Smolin (TSE)

Teaching assistants (TBC): Antoine Jacquet, Alae Baha, Charles Pebereau and Yang Yang.

Course's Objectives - Objectifs du cours :

The game theory class is an introductory course to game theory. The objective is to provide rigorous foundations to the study of games that have become an important part of modern economics. At the end of the class we expect the students to be able to formalise an economic situation as a game and to solve it using the appropriate solution concept(s).

Course outline: The main tools of game theory are studied in turn: from static games under complete information to dynamic games under incomplete information. The course is illustrated with economic examples and applications, such as: Bertrand and Cournot models of competition, dynamic games of competition, bargaining games, signalling games, models of voting, collusion and repeated games, auctions, coordination games, bank runs, investment races; and so on. Students have access to a collection of problem sets with their correction (available on the moodle platform). These problems are studied during the tutorials. Slides containing the theoretical material taught during the lectures is at the disposal of the students on the moodle platform. The summary of their content is the following:

O. Defining and representing games (Normal form games, Mixed extension of a normal form game, Extensive form games, Extensive form and normal form); 3 - 4 lectures
I. Static games of complete information (Games under normal form, The notion of strict dominance, The best response correspondence and Nash equilibria in pure strategies, The mixed extension of a normal form game, The best response correspondence and Nash

equilibria in mixed strategies, Link between Nash equilibria and strict dominance) ; 5 - 6 lectures.
II. Dynamic games of complete information (Games under extensive form, Extensive form and normal form, Nash equilibria and backward induction, Subgame perfect Nash equilibria) ; 5 - 6 lectures
III. Repeated games (Finitely repeated games, Infinitely repeated games), 4 – 5 lectures
IV. Games with incomplete information . 2 – 4 lectures

Prerequisites - Pré requis :

There is no prerequisite, apart from the most basic mathematical tools (derivatives and basic calculus), and a taste for rigorous reasoning.

Practical information about the sessions - Modalités pratiques de gestion du cours :

Lectures: 30 hours, Language: English (2 classes) and French (1 class). Tutorials: 12 hours (7 “Standard sessions” and one “Question session”), Language: English. The organisation of the lectures is as follows: three lectures are taught each week during the first 5 weeks (Monday, Tuesday and Thursday), during the remaining 5 weeks there is one lecture taught on Thursday.

Grading system - Modalités d’évaluation :

Midterm exam (20%) and final exam (80%).

Bibliography/references - Bibliographie/références :

There is no compulsory textbooks, but we would recommend:
Robert Gibbons, “A primer in Game Theory”, Wheatsheaf Books, 1992; this book can also be found under the title “Game Theory for Applied Economists”, Princeton University Press.
Steven Tadelis, “Game Theory: An Introduction”, Princeton University Press.

More detailed and advanced material can be found in:
Martin Osborne and Ariel Rubinstein, “A course in Game Theory”, The MIT Press,
Martin Osborne, “Introduction to Game Theory: International Edition”, OUP Oxford,
Drew Fudenberg and Jean Tirole, “Game Theory”, The MIT Press.