



Game Theory

Class Meetings: Wednesday 12-14h, Room FMA/00.08

Course Page: Material will be posted on Virtual Campus

Course Description:

Goal of the course is to give an introduction to the basic concepts of game theory, with an emphasis on economic applications. We start by analyzing situations in which players make their decisions simultaneously and have complete information about each other's payoff. Situations in which decisions are made sequentially are covered in greater detail. We furthermore cover static and dynamic games under complete and incomplete information, together with relevant equilibrium concepts and refinements. Applications to real-world problems cover settings involving strategic interdependence in the field of competition and signaling.

Game theory has become a vital methodology for researchers in many disciplines and has found its way into pop art, films, and other fields of daily life. This course starts with analyzing situations in which players make their decisions simultaneously and have complete information about each other's payoff. In greater detail we will focus on situations in which actors make their decisions sequentially and therefore must take into account how opponents may respond to their decisions. The course thus analyzes static and dynamic games with complete and with incomplete information and focus on the refinements of equilibrium concepts.

A variety of real-world problems can be analyzed in strategic settings as they focus on situations that involve strategic interdependence. Take for example industrial organization: the market price in an industry is not only the result of your own output but also of the output of your competitors. Similarly, we observe in the field of international trade that the levels of imports, exports, and prices do not only depend on domestic tariffs but also on tariffs of other countries.

Incomplete information is a topic that has gained enormous ground in the literature of the past 2 decades. Think of a dynamic game in which earlier moves of a player may convey information to the opponent player about some relevant variables. Revealing and concealing information are the basis of strategic behavior and are therefore particularly useful to explain actions that would be seen as irrational in a non-strategic world. Signaling games, as well as repeated games (finitely and infinitely) under symmetric information, and some topics in bargaining games conclude the course.

Readings: We will be using "Strategy: An Introduction to Game Theory" by Joel Watson (New York: Norton, 2007, 2nd ed). Check also Joel Watson's page at <http://weber.ucsd.edu/~jwatson/strategy.htm>.

Slides: Lecture slides that will be used during class can be downloaded from the course page at least one day before class on Virtual Campus.

Tentative Course Outline (to be updated every 3-4 weeks):

Topic	Chapter
Representing Games	
The Extensive Form	2
Strategies	3
The Normal Form	4
Analyzing Behavior in Static Settings	
Beliefs and Mixed Strategies	5
Dominance, Efficiency, and Best Response	6
Iterated Dominance	7
Partnership Games and Best Response	8
Nash Equilibrium	9
Oligopoly: More examples	10
Mixed-Strategy Nash Equilibrium	11
Best Response Correspondences	11
Analyzing Behavior in Dynamic Settings	
Details of the extensive form	14
Backward Induction & Subgame Perfection	15
Subgame Perfection and Nash Equilibria	15
Information	
Introduction: Incomplete Information	24
Bayes-Nash Equilibrium	26
Perfect Bayesian Equilibrium	28
Signaling Games	29

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