Introduction to Game Theory
ICPSR First Session, 2012
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Course Purpose and Design:
This course introduces many of the fundamental concepts and tools for understanding basic game theory.

Strategic concerns are an important element to many social or political decisions. Therefore, a basic understanding of strategic choices will enhance one’s understanding of social interactions and politics.

The formal analysis inherent to game theory methods is deductively structured and logically based. However, no mathematical background beyond simple arithmetic is presumed for this course. Those students with some familiarity with game theoretic tools will have a chance to refine those tools.

The course has three goals. Our first goal is to learn some basics. Our second goal is to understand the application of game theory tools to various aspects of politics. Our third goal is to begin the development of our own applications of the tools and techniques discussed. The careful application of formal work will be a prominent concern throughout the course.

Key Concepts covered in the course include:
At the broadest levels: Cooperative game theory, noncooperative game theory, equilibrium concepts
At more refined levels: pure and mixed strategies, complete and incomplete information, perfect and imperfect information, subgame perfection, beliefs

Reading Material:
The main text is Joel Watson’s *Strategy: An Introduction to Game Theory, 2nd Edition*. Other readings will be available electronically. Generally, the electronic
articles apply game theoretic tools. We will not discuss and I will not vouch for
the substantive applications themselves.

**Lecture Style:**
I will use some powerpoints but there is considerable board time.

**Grading:**
Grades are based on homework (@50%) and a final (@50%). Homework will be
assigned toward the middle of the week (T, W, Th). T & W homework will be
due on Friday. Th homework will be due on Monday.

**Syllabus and Course Structure**
This course is has 20 days. We will not meet on the 13th day, which is the 4th of
July. The final will be on the 20th day. We are left with 18 two-hour days. This
syllabus is my best estimate of what we’ll cover and when we’ll cover it.

*ata=as time allows

I will try to use Fridays for catching up with material, discussing some homework
problems, and handling other questions.

**Day 1:**
**How do we understand people?**
Introduction, preferences, utility

Watson Ch. 1

**Day 2:**
**What features of a social or political situation create a game?**
Extensive and Normal Form Game Forms

Watson Ch. 2, 3

Figuring out those payoffs...

Geddes. 1991, “A Game Theoretic Model of Reform in Latin American
Days 3 & 4:  
**Bargaining, Part I**  
The Nash Bargaining Solution and Cooperative Games

Watson Ch. 18


*notes on Coase.


Day 5  
**First Friday**

Day 6  
**Back to the Present**  
Normal Form Games

Watson Ch. 4 & 5

Day 7  
**Strategies and Equilibrium Concepts**

Watson Ch. 6, 7 & 12

Day 8  
**Strategies and Equilibrium Concepts, cont.ed**

Watson Ch. 8, 9, 10 & 11

Day 9  
**Simple Games to Introduce Preferred to Sets and Win Sets**


Day 10
Second Friday
A Comprehensive Overview of Models of Legislatures


Days 11 & 12
Subgame Perfection and Subgame Perfection Examples

Watson Ch. 14 & 15


Day 13
No Class! It’s your independence day!

Day 14
Another look at bargaining

Watson Ch. 19


Day 15
Third Friday
Repeated games


Watson Ch. 22

Day 16
Games of Incomplete Information

Watson Ch. 24, 26 & 28
Day 17
Introducing Signals


Day 18

Day 19
Review

Day 20
Final

By the end of this course, the following list of concepts and jargon will have been introduced.

backward induction, bayes theorem, beliefs, Cartesian product, complete information, cooperative game, core, coordination, directed graph, dominance, dominate, edge, extensive form game, focal point, incomplete information, information set, iterated dominance, mapping, mixed strategy, mixed strategy equilibrium, Nash Bargaining Solution (NBS), Nash equilibrium, nature, node (initial & terminal), non-cooperative game, normal form game, pareto, player, preferred to sets, rationalizable, repeated game, strategic form game, strategy, subgame, subgame perfection, tree, types, utility, v-set, win sets, zero sum

There are many very good game theory references. The following is a woefully incomplete list.

Austen-Smith and Banks have a two volume set. The first volume explores the connections between social choice theory and game theory.
Friedman is an economic historian who also studied duopoly theory and game theory.
Kreps has an extensive micro econ text that has excellent game theory presentations.
Luce and Raiffa’s Game and Decisions is a classic.
McCarty and Meirowitz are political scientists who wrote a game theory text that is a notch more advanced than Watson’s.
Myerson wrote a very nice text back in the 1990s. Subsequently, he received a Nobel Prize for his work on mechanism design.
Osborne has several game theory texts that are fairly commonly used.