Pols 8020: Introduction to Game Theory

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Course Purpose and Design:
Strategic concerns underpin social and political settings. As such, a basic understanding of strategic choices enhances one’s understanding of our social and political environs. Appreciating strategic interactions also allows us, as social scientists, to assess data generating processes. That is, are the data that we evaluate “just there” or are they a product of individuals’ strategic actions.

A foundation in game theory often leads to clearer hypotheses for empirical assessment.

Increasingly, game theoretic tools are used to assess normative implications related to issues stemming from distribution. That is, how does one divide a pie fairly. This course introduces fundamental concepts and tools for understanding basic game theory.

The formal analysis inherent to game theoretic methods is deductively structured and logically based. No advanced mathematical background is presumed for this course. Some set theory and calculus will be introduced but only as needed. For students with limited background in game theory, this course is a great introduction. Those students with some familiarity with game theoretic tools will have a chance to refine and extend those tools.

The course has three goals. Our first goal is to become comfortable with the basics. Our second goal is to understand the application of game theoretic tools to various settings. 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 level, we will introduce some social choice theory, cooperative game theory, and noncooperative game theory. Various equilibrium concepts will be introduced.

Reading Material:
The main text is Joel Watson’s Strategy: An Introduction to Game Theory, 3rd Edition. Recommended selections will be drawn from McCarty and Meirowitz’s (McCM) Political Game Theory and Gelbach’s Formal Models of Domestic Politics. I will try to distribute pdfs of limited sections. Pdfs of some articles will also be available. Generally,
these articles apply game theoretic tools to specific social or political settings. Our discussion of the substance of the applications will be limited, and I will not vouch for the meaningfulness of substantive applications. Instead, for the articles, we will focus on the development of the game theoretic model.

**Presentation Style:**
I will use slides, but there will also be considerable board time.

**Grading:**
Grades are based on homework (@50%), a paper (@35%), and a final (@15%). The final is structured like a bigger homework.

**Syllabus and Course Structure**
This course has @15 days. The last few sessions will include student presentations. This syllabus is our best estimate of what we’ll cover and when we’ll cover it.

*** Know that I will revise this syllabus as the course proceeds.

**Note:** Watson’s chapters are very short. The McCarty and Meirowitz (McCM) chapters are longer and more advanced. Gelbach is more conceptually oriented. Other reading assignments will be selected from the syllabus as we proceed.

**Day 0: Introductions**


**Day 1:** As with other tools for the social sciences, game theory characterizes people.

**Characterizing People: An Introduction to Preferences & Utility**

Watson Ch. 1

McCM Ch. 2

Recommended:

Luce and Raiffa’s *Games and Decisions* Ch. 2

Further Reading:

**Day 2:** As a tool for the social sciences, game theory also characterizes interactions between people.

**The Features of Social or Political Settings that Create a Game**
Characterizing Choices and Outcomes for Extensive and Normal Form Game Forms

Watson Ch. 2, 3, 4, 5, & 14

**Day 3:** Game theory also characterizes the outcomes from interactions.

**Equilibrium Concepts**

Watson Ch. 4, 5, 6, 7, 9, 11, 12, & 15

McCM Ch. 5 & 7


**Day 4:**

**Equilibrium Concepts, cont.ed**

Watson Ch. 8, 9, 10, 11, 14, & 15

Gelbach Ch. 1
Day 5: Looking ahead to think back.

Applications with Subgame Perfection


Day 6: Considering beliefs and the connections between beliefs and actions. Are all beliefs reasonable? Can any action be justified?

Perfect Bayes

Watson Ch. 24, 26, & 28

McCM Ch. 8

Day 7:

**Introducing Signals**

McCM Ch. 8


Day 8:

**Introducing Cooperative Game Theory and Bargaining Models**

Luce and Raiflà’s *Games and Decisions* Ch. 8, 9

Skim Ordeshook’s *Game Theory and Political Theory* Ch. 7, 8, 9

**With Guidance from “Accepted Principles:” The Nash Bargaining Solution**

Watson Ch. 18

Luce and Raiflà’s *Games and Decisions* Ch. 6
Another look at bargaining

Watson Ch. 19


Day 9:

Social Choice Theory and Applications of Cooperative Games

McC&M, 4


Day 10:

Simple Games to Re-Introduce Preferred to Sets and Win Sets


Gelbach Ch. 4

Days 11, 12, 13:

Overflow, catch-up days.

Student presentations

Day 14:

Repeated Games v. Dynamic Games

Watson Ch. 22


By the end of this course, the following concepts will have been introduced:

backward induction, Bayes’ theorem, beliefs, Cartesian product, cheap talk, complete information, cooperative game, core, coordination, directed graph, dominance, dominate, edge, extensive form game, focal point, imputation, incomplete information, information set, iterated dominance, intuitive criterion, mapping, mixed strategy, mixed strategy equilibrium, Nash Bargaining Solution (NBS), Nash equilibrium, nature, node (including initial & terminal), non-cooperative game, normal form game, pareto, perfect Bayes, player, pooling, preferred-to-sets, rationalizable, repeated game, separating, sequential rationality, strategic form game, strategy, subgame, subgame perfection, tree, types, utility, v-set, yolk, win sets, zero sum
Addendum

Groups and Group Identity


Fads and Conformity


Schelling. Micromotives and Macrobehavior.

Selection Issues


Emergence of Institutions


