Political Science 835
Game Theory and Political Analysis
Spring 2014

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Lecture Time and Location: Tuesday 1:20–3:15, 422 North Hall
Office Hours: Tuesday 10:00–12:00. Please see http://users.polisci.wisc.edu/gehlbach/contact.html to schedule an appointment.
Course Website: http://users.polisci.wisc.edu/gehlbach/835spr2014.html
ClassList: polisci835-1-s14@lists.wisc.edu

Overview

This course is an introduction to game theory: the mathematical analysis of strategic decision making. The bulk of the course is organized around classes of “games,” that is, representations of strategic environments. For each class of games we will develop and learn to use one or more “solution concepts,” that is, methods of deriving predictions. When possible, we will appeal to applications from political science. That said, the concepts are general, and social scientists from neighboring disciplines should find the course accessible and useful.

Along the way, we will also discuss theories of individual and social choice. A theory of individual choice is essential to any model of group choice derived from the preferences of individual actors; game theory is a general framework for building such models. Social-choice theory—the study of how individual preferences are aggregated directly into social preferences, rather than indirectly through strategic choice—is an alternative approach to modeling group choice. We study social-choice theory both because of its importance to political science in general and because of the close relationship between many results in social-choice theory and those in game theory.

Course Requirements

There are four components to the course grade:

- Midterm exam: 35 percent
- Final exam: 45 percent
- Problem sets: 10 percent
- Reaction papers: 10 percent

Problem sets will be distributed every Tuesday that class meets but March XX and May 6. They are due the following Tuesday in class. Grading of the problem sets will be “coarse,” with each problem set given a check plus (exemplary effort), check (complete/good effort),
check minus (incomplete/poor effort), or zero (not turned in). Despite the coarseness, and notwithstanding the small direct contribution to your final grade, by far the most important thing you can do in this course is to give yourself heart, body, and soul to the problem sets. Do not be tempted into easing back for a problem set or two, with the thought that you can catch up before the exam. This material is like a train: if you get off at one station, you will find it very difficult to get back on at the next. Do work in groups, but ideally only after you have already attempted to solve the problems on your own; the final writeup should be your own. Please see me and your teaching assistant when you have questions.

Although there is no formal participation grade, attendance in discussion section is required. Among other benefits, this is where you will learn many of the tricks used to solve problems.

In addition to regular class attendance, you are required to attend the Political Economy Colloquium, which meets irregularly and jointly with one of the subfield colloquia, depending on the substantive focus of the talk. The colloquium schedule and papers to be presented will be posted at http://users.polisci.wisc.edu/pec/. If you have an unavoidable conflict, please let me know in advance.

You will get much more out of presentations if you have read the papers in advance. I therefore ask you to choose two colloquium presentations for which you will read the paper closely prior to the talk. You will undoubtedly have questions, e.g., about the assumptions of a model or the empirical implications of a theoretical framework. You should email me one such question before the talk, and you should then find a satisfactory answer to that question while the speaker is in town (e.g., by raising the question during the presentation or by meeting with the speaker in person). The following Monday, you should turn in a short written discussion, of approximately 300–500 words, of the question and answer. I expect entries to be written in clear prose and to be free of grammatical and punctuation errors.

**Reading**

In contrast to many topics in political science, game theory is best taught from a textbook. There are two texts for the course, both available at the University Bookstore and elsewhere:


Additional readings are listed below and will be made available through online library reserves, accessible from My UW.

**Schedule**

Readings are given in *chapter.section.subsection* format.
I Individual and Social Choice

January 21—Individual Choice Under Certainty and Uncertainty
McCarty and Meirowitz 2, 3

January 28—Social Choice
McCarty and Meirowitz 4

II Strategic Games with Perfect Information

February 4—Nash Equilibrium
Osborne 2
McCarty and Meirowitz 5.1, 5.2.2, 5.6

February 11—Applications: Electoral Competition, the Commons Problem
Osborne 3.3
McCarty and Meirowitz 5.3

February 18—Mixed-Strategy Nash Equilibrium
Osborne 4.1-4.5, 4.7-4.10, 4.12
McCarty and Meirowitz 5.4, 5.13

February 25—Rationalizability and Iterated Dominance
Review Osborne 2.9, 4.4
Osborne 12
McCarty and Meirowitz 5.2.1, 5.5

III Extensive Games with Perfect Information

March 4—Subgame-Perfect Nash Equilibrium
Osborne 5, 7.1
McCarty and Meirowitz 7.1, 7.3, 7.5
March 11—MIDTERM EXAM
March 18—SPRING BREAK
March 25—Application: Repeated Games
  Osborne 14, 15
  McCarty and Meirowitz 9

April 1—Application: Bargaining Models
  Osborne 16.1
  McCarty and Meirowitz 10.2–10.4

IV Strategic Games with Imperfect Information
April 8—Bayesian Nash Equilibrium
  Osborne 9.1-9.3
  McCarty and Meirowitz 6.1, 6.3, 6.8

V Extensive Games with Imperfect Information
April 15—Weak Sequential Equilibrium and Perfect Bayesian Equilibrium
  Osborne 10.1-10.4
  McCarty and Meirowitz 8.1

April 22—Application: Signaling Games
  Osborne 10.5, 10.7
  McCarty and Meirowitz 8.2, 8.3, 8.6.2

VI End-of-Semester Festivities
April 29—Cooperative Game Theory
  Osborne 8.1-8.2, 8.6

May 6—TBA