Course information:
Course Number: POLSCI.890-1.01.Sp14
Time: Th 10:05 AM–12:35 PM
Place: Biological Sciences 063
Course website: Sakai

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Course Description

This is the second semester in the game theory sequence. The prerequisites are the first semester in deductive/analytical approaches and the department’s math camp, or the equivalent of both. However, there will be a review of the material from the first semester of game theory, so don’t worry if your game theory is rusty. The first few weeks also review/introduce many mathematical tools. And, of course, I will be happy to answer questions in class or help out of class.

The course has two primary aims. The first is a better understanding of the technical modeling literature. By the end of the course you should not only be able to read and understand most of it, but also have a good idea as to why authors made the choices they did, and what they gained or lost by making them. The second is an enhanced ability to write models of your own. Throughout the course you will be exposed to an array of different theoretical modeling choices, from signaling and bargaining games to agency problems to (if time permits) behavioral models and computational methods, both to familiarize you with them and to indicate which may be of best use in a given context. Along the way we will also discuss how to present formal models, which can be as important as the modeling decisions themselves.

Course Format

I believe the best way to learn modeling is by doing, and the class structure reflects this. I have partitioned the course into eight sections, some of which have subtopics. After each of the first six sections there will be a problem set, which will be due at the beginning of class two weeks after we complete the section. These problem sets will require a significant input of time, and represent the most important mechanism for developing mastery of the material. You will be provided with detailed solutions to the problem sets in the class in which they are due, and will be expected to carefully read through these and come to the following class with any questions.

As a supplement to the required text I will post lecture notes to Sakai. I expect you to have made an attempt to read both text and notes before class. This will help you ask questions in class that will be of most use to you, and I encourage frequent interruptions in that regard. It is easy to fall behind, and no question which helps prevent this is a bad one. I also recommend going over the text or the notes again after class, to cement your understanding. This syllabus lists as well recommended readings for class topics; these are published works relevant to the topic and often referenced in the text. I strongly suggest that you at least read through model set-ups and justifications in the recommended readings.

At the conclusion of the class you will write a model of your own designed to address a question of substantive interest to you. The purpose of this model is not to produce an immediately publishable work of formal theory. It is instead to take some early steps in formalizing your thoughts, understand what this entails, and help you to discern your future interests in this area.
Readings

The required textbook for the course is McCarty, Nolan and Adam Meirowitz. 2007. Political Game Theory: An Introduction. New York: Cambridge University Press (MM). I will also post to Sakai related notes prior to most classes, usually several weeks beforehand. You are responsible for reading both text and notes carefully and coming to class with questions. I will provide additional notes detailing the examples we will go over in class after we go over them. Recommended papers are mostly available in the usual places.

Course Requirements

- Participation (10%): I expect active participation in the form of questions during class.

- Problem Sets (60%): This is by far the most important part of the course. You are welcome to work together on these, but each person must write up the solutions on his or her own, either by hand (assuming your handwriting is legible) or by computer (preferably in \LaTeX). You are strongly encouraged to make sure that you understand each thing you write down, and I encourage you to come talk to me if this is proving difficult. This is for your benefit, not mine; you will get much more out of the class this way. I will pass out a solution key to each problem set after it is turned in. I will give generous credit for making the attempt at a difficult problem even if the solution is not found, so don’t worry if your answers are not flawless.

- Original Modeling Paper (30%): You are to produce by the last class a paper comprising an original model and its solution. This paper must contain a formal presentation of the model, substantive justifications for all modeling assumptions and parameters, a brief (no more than one paragraph) introduction detailing the question the model is intended to address, a brief (no more than three pages) discussion of insights derived from the model, and an appendix with a formal solution of the model. The model may be on any topic, as long as it uses methods discussed in class. It must be typewritten (again, preferably in \LaTeX). Length will vary based on the complexity of the model. You may combine this paper with one you will be using for another purpose; however, my expectations as to polish will rise in this case. Prior discussion with me about both the substance of and the methods employed in the paper is strongly encouraged. As with the problem sets, I will be generous in giving credit for attempting something difficult even if the outcome isn’t perfect, so please feel free to stretch yourselves.

Tentative Schedule:

Section 1: Review of Intro Game Theory and 1-D Calculus

Reading: None, but it might be helpful to read over your notes from Intro Game Theory and math camp prior to class.

Section 2: Individual and Group Choice

Topic: Choice, Uncertainty, and Mathematical Underpinnings.

Required reading: MM Ch 2,3
**Recommended readings:**

**Topic:** Social Choice Theory and Methods of Proof

**Required reading:** MM Ch 4

**Recommended readings:**

**Section 3: Normal and Extensive Form Games**

**Topic:** Normal Form Games and Comparative Statics

**Required reading:** MM Ch 5

**Recommended readings:**

**Topic:** Bayesian Games

**Required reading:** MM Ch 6

**Recommended reading:**

**Topic:** Extensive Form Games

**Required reading:** MM 7

**Recommended readings:**
Section 4: Dynamic Games of Incomplete Information

**Required reading:** MM Ch 8 (Through section 5)

**Recommended reading:**

Section 5: Refinements and Repeated Games

**Topic:** Equilibrium Refinements and Herding Models

**Required reading:** MM Ch 8 (Through end)

**Recommended reading:**

**Topic:** Repeated Games

**Required reading:** MM Ch 9

**Recommended reading:**
Section 6: Bargaining

Required reading: MM Ch 10

Recommended reading:

Section 7: Mechanism Design and Agency Theory

Required reading: MM Ch 11

Recommended reading:

Section 8: Modeling Grab Bag: Behavioral Models, Computational Methods, Quantal Response Equilibrium, and Global Games

Required reading: