Syllabus - Economics 521

Course Description

Economics 521 is a semester long course on game theory, a discipline that provides a mathematical methodology for modeling and analyzing interactive decisions among multiple agents. Game theory has a wide range of applications in economics, political science, computer science, and other fields.

The approach of this course will be somewhere between that of a typical mathematics class and that of a typical economics class. Definitions will be stated formally, and arguments will be developed rigorously, as in a math class. At the same time, much of the course will be devoted to using game theory to understand applications in economics and other fields. Taking these applications as a starting point, we will develop an understanding of what constitutes a good mathematical model for addressing an economic question.

Prerequisites

The prerequisites for this class are Economics 301 (microeconomics) and Mathematics 222 (second semester calculus); having some background in probability theory (e.g., Economics 310) is also helpful. What is more important than any specific previous coursework is to have some degree of “mathematical sophistication”, by which I mean a level of comfort with material presented in a formal fashion.

Reading Materials

The textbook for this class is


I will also post a typeset copy of my lecture notes on the course website.

Early in the course we will review some of the basics of probability theory. For this I have a reading from a textbook-in-progress that I am writing with a friend:


Other supplementary readings will come from


There are links to the readings on the course website.

Here are two game theory whose presentations are at a somewhat lower level than Osborne’s.

To go deeper into the topics we consider, I recommend these graduate textbooks:


**Course Outline**

Unit 1: Preferences, utility, and rationality
Unit 2: Dominance, iterated dominance, and rationalizability
Unit 3: Pure strategy Nash equilibrium
Unit 4: Mixed strategy Nash equilibrium and the minmax theorem
Unit 5: Extensive form games with perfect information
Unit 6: Bayesian games
Unit 7: Auctions
Unit 8: Extensive form games with imperfect information

**Readings and Problem Sets**

Details about the readings and problem sets for each unit will be posted on the course website. The solutions to some problems assigned from Osborne’s book are posted on his website, which you can reach from the link on the course website (see below).

**Exams**

We will have two midterms during our scheduled class meetings, one on Tuesday, October 16, and the other on Thursday, November 15. The final exam will be held on Tuesday, December 18 from 12:25 to 2:25 pm in a room to be determined later.

**Grading**

The weights placed on problem sets, midterm 1, midterm 2, and the final will be 20%, 20%, 20%, and 40%, respectively.

**Contact information**

The Economics 521 website is

http://www.ssc.wisc.edu/~whs/teaching/521

My office is 7436 Social Science. You can reach me by e-mail at whs@ssc.wisc.edu or by phone at 263–3858. My office hours are on Thursdays from 11:15 to 12:15, on Fridays from 2:30 to 3:30, and by appointment.

The TA for this course is Man Wah Cheung. Her office is 6439 Social Science. She can be reached by e-mail at mcheung4@wisc.edu. Her office hours are on Mondays from 2:15 to 3:15, on Tuesdays from 11:00 to 12:00, and by appointment.