

# ECONOMICS 109: GAME THEORY

Winter 2009

Lectures: T, Th 2:00 – 3:20 pm  
Discussion: W 7-7:50 pm & 8-8:50 pm CSB 002

Centr 216

Prof: Herb Newhouse

email: [hnewhous@weber.ucsd.edu](mailto:hnewhous@weber.ucsd.edu)

Office Hours: Wed 1 – 3 pm

Course webpage available on: <http://webctweb.ucsd.edu>

Some material will be temporarily available at: [econ.ucsd.edu/~hnewhous/econ109](http://econ.ucsd.edu/~hnewhous/econ109)

Office: Marshall 103 (Door 2): It's to the left of Eucalyptus Point coming from the Economics department.

TAs: (Office hours will be announced.)

Adam Sanjurjo ([asanjurjo@ucsd.edu](mailto:asanjurjo@ucsd.edu))

Kristy Buzard ([kbuzard@ucsd.edu](mailto:kbuzard@ucsd.edu))

Gray Calhoun ([gcalhoun@ucsd.edu](mailto:gcalhoun@ucsd.edu))

This course examines strategic situations, in which each agent's behavior generally affects the well-being of the other agents. Game theory is a technical framework for rigorously analyzing decision-making in such settings. Almost every type of interaction between living things is strategic. As social scientists, we focus on human interaction, and we shall assume that people behave in a rational, deliberate manner. In addition to exploring theory in the abstract, we will consider a variety of applications from economics, political science, and law.

Prerequisites: ECON 100B or 170B.

Lectures and Problem Sessions:

You are responsible for all the material in the lectures. Partial notes will be available on the class webpage before each lecture. I recommend that you print these out before hand and fill in the missing information. I'll do my best to avoid typos but you're responsible for the correct material. I want you to understand the material instead of simply memorizing it. If you miss a lecture, borrow someone's notes. Discussion sessions are optional but recommended.

Exams:

Your grade will be determined on the basis of two Midterm Exams (20% for the first, 30% for the second) and the Final Exam (50%). Alternatively your lower midterm will count for 10% less (10% or 20%); your higher midterm will count the given percentage (20% or 30%) and your final will count for 60%. If you miss a midterm for a documented, university approved reason (ie., illness, official university trip) the weight for that exam will be placed on the final. If you miss a midterm for another reason (ie., oversleep) you will receive a zero for that exam. No one will be allowed to start an exam after the first person leaves.

Midterm 1 will be held in class on Tuesday, January 27th. Midterm 2 will be held in class on Thursday, February 19th. The final exam will be held on Thursday, March 19th from 3:00pm – 6:00pm. If you know in advance that you cannot make an exam, please let me know as soon as possible.

You are only permitted to use pens and pencils, a straight edge and a note card during the exams. Calculators are *not* allowed. The note card can be any size up to 8" by 5" for the midterms and up to 8.5" by 11" for the final. It may have handwritten notes on both sides. Typed or mechanically reproduced notes are not permitted.

Academic dishonesty:

I take academic dishonesty seriously. Any student found guilty of academic dishonesty will earn a failing grade for the course. In addition to this sanction, the Council of Deans of Student Affairs will also impose a disciplinary penalty. For a review of UCSD policy, please see <http://www-senate.ucsd.edu/manual/appendices/app2.htm>.

Regrade requests:

Regrade requests are only permitted if you took the entire exam in pen. These requests must be made through a signed statement before the start of class one week after the exam was first passed back. Extensions will only be permitted if you have a documented, university approved reason for missing the entire week after the exam was first passed back. If you request a regrade I may regrade your entire exam and your score could go up or down.

Text: Watson, J., *Strategy: An Introduction to Game Theory* (W.W. Norton), 2nd Ed.

We will follow the textbook closely and practice problems will be assigned from it.

Practice Problems:

Practice problems will be available online. We will go over these questions in office hours and in the discussion sessions. Your best practice for the exams is to try these questions yourself first.

Preliminary Course Outline: (I'm hoping to cover one bullet point per lecture.)

1. Representing Games

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|--|---------|
| a. Intro, extensive form representation, strategy                          | Ch. 1-3 |
| b. Normal form representation, mixed strategies, beliefs, expected payoffs | 3-5     |

2. Analysis of Static Settings

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|---|-------|
| a. Dominance, best response   | 6     |
| b. Efficiency, rationalizability                                      | 7     |
| c. Examples   | 8     |
| d. Nash equilibrium, examples, applications                           | 9-10  |
| e. Mixed strategy NE, strictly competitive games, security strategies | 11-12 |
| f. Contract I (static settings)                                       | 13    |

3. Analysis of Dynamic Settings

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|---|-------|
| a. Extensive form sequential rationality                        | 14    |
| b. Subgame perfection, examples and applications (two lectures) | 15-16 |
| c. Bargaining   | 18-19 |
| d. Contract II  | 20-21 |
| e. Repeated Games   | 22-23 |

4. Information

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|---|-------|
| a. Incomplete information, examples           | 24    |
| b. Bayesian Nash equilibrium, examples        | 26-27 |
| c. Perfect Bayesian equilibrium, applications | 28-29 |

(Note: This course outline is preliminary. I'll provide a more specific set of readings in the lecture notes.)