

# ECONOMICS 109: GAME THEORY

Summer II 2016

Lectures: MTWTh 12:30 – 1:50 pm  
Discussions: F 12:30 – 2:20 pm in CENTR 216

CENTR 216

Prof: Herb Newhouse (hnewhouse@ucsd.edu)

Office: Econ 108

Course webpage: <https://tritoned.ucsd.edu>

Office Hours: Tues 9:20 – 10:20 am & Wed 2:00 – 3:00 pm

TA: Paul Feldman (pfeldman@ucsd.edu)

Office Hours: TBA

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 100C or Math 31CH or Math 109 or both CSE 20 and Math 20C.

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 a Midterm Exam (40% or 30% of your grade) and a Final Exam (60% or 70%). The weights will be chosen so that you receive the highest grade. If you miss the 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 the 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.

The midterm will be held in class on Thursday, August 18th. The final exam will be held on Saturday, September 3rd from 11:30am – 2:30pm. 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 single note sheet during the exams. Calculators are *not* allowed. The note sheet can be any size up to 8.5" by 11". It may have handwritten notes on both sides. Typed or mechanically reproduced notes are not permitted. Do *not* attach anything to your note card.

During the exams you cannot sit next to anyone with whom you studied.

Academic dishonesty:

I take academic dishonesty seriously. Any student found guilty of academic dishonesty will most likely 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 take the entire exam in pen. The deadline for regrade requests for the midterm is Thursday, August 25th by the time I leave our classroom. Regrade requests must be made in writing. It's helpful if you provide a brief explanation about why you believe you deserve additional points. If you request a regrade I may regrade your entire exam and your score could go up, down or stay the same.

**Do not add or change anything on your exam if you request a regrade!** You can write your regrade request on the cover. Other than that your exam should look exactly like it did when it was first passed back to you.

Text:

Watson, J., *Strategy: An Introduction to Game Theory* (W.W. Norton), 3rd 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:

1. Representing Games
  - 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
  - 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
3. Analysis of Dynamic Settings
  - a. Extensive form sequential rationality 14
  - b. Subgame perfection, examples and applications (two lectures) 15-16
  - c. Bargaining 18-19
  - d. Repeated Games 22-23
4. Information
  - 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.)