

ECONOMICS 109: GAME THEORY

Fall 2014

Lectures: MWF 12:00 – 12:50 pm in PCYNH 109
Discussion: W 6-6:50 pm & 7-7:50 pm in PETER 104

Prof: Herb Newhouse
Office Hours: Thursdays 10:00 – 11:30 am

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

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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 (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 two Midterm Exams (25% each) and the Final Exam (50%). Alternatively your lower midterm will count for 15%; your higher midterm will count for 25% and your final will count for 60%. The method of weighting that results in the highest grade will automatically be chosen at the end of the quarter.

Midterm 1 will be held in class on Friday, October 24th. Midterm 2 will be held in class on Monday, November 17th. The final exam will be held on Thursday, December 18th 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 must get the instructor's permission (in advance if possible) if you miss a midterm. If you miss a midterm for an approved reason the weight for that exam will be placed on the final. If you miss the final exam for a documented, university approved reason (ie., illness, official university trip), you will most likely receive an Incomplete for the class and will need to make-up the exam during the following quarter. If you miss the final exam for another reason (ie., oversleep) you will receive a zero for the exam. No one will be allowed to start an exam after the first person leaves it.

You are only permitted to use pens and pencils, a straight edge and a single note card during the exams. Calculators are *not* allowed. The note card can be any size up to 8.5" by 5.5" for the midterms and up to 8.5" by 11" for the final. It may **only** have handwritten notes on both sides. Typed or mechanically reproduced notes are not permitted. Do **not** attach anything to your note card. If your note sheet does not adhere to any of these conditions it will be immediately confiscated during the exam. Additionally a report may be filed with the Academic Integrity Office.

You **cannot** sit next to anyone you studied with during an exam.

Academic dishonesty:

I take academic dishonesty seriously. Any student found guilty of academic dishonesty will almost certainly 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 the entire exam is answered in pen. Regrade requests must be made through a written statement **before** the start of class one week after the exam was first passed back. This deadline is firm! 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, down or stay the same. **Do not add or change anything on your exam if you request a regrade!**

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

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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 |

3. Analysis of Dynamic Settings

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| a. Extensive form sequential rationality | 14 |
| b. Subgame perfection, examples and applications | 15-16 |
| c. Bargaining | 18-19 |
| d. 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.)