# ECONOMICS 109: GAME THEORY

Summer I 2014      Lectures: MTWTh 9:30 – 10:50 sm      Peter 103
          Discussion: W 11:00 am – 12:50 pm in Peter 103

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Course webpage: https://ted.ucsd.edu           Office Hours: TBA

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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 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.

Grades:

Your grade will be determined on the basis of Clickers (10%), a Midterm Exam (40%) and the Final Exam (50%). Alternatively clickers will count for 10%, your midterm will count for 30% and your final will count for 60%. Alternatively, still, your midterm will count 40% 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.

Exams:

The midterm will be held in class on Thursday, August 21st. The final exam will be held on Friday, September 5th from 8:00 – 11:00 am. If you know in advance that you cannot make an exam, please let me know as soon as possible.

If you miss the midterm for an approved reason the weight for it will be added to 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 course 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.

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 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.

Clickers:

I plan to have approximately one set of clicker questions per class. A question will first be asked and you will receive one point for answering (regardless if that answer is right or wrong). There will then be a few minutes in which in which you may discuss the question with a few of your classmates. After the

discussion the question will be asked again and you will receive one point only if your answer is correct. At the end of the quarter your clicker score will be equal to your total number of points divided by 80% of the total number of points available up to a maximum score of 100%.

The only reason the total number of points will be adjusted for an individual student is for a documented, long term (one or more weeks) illness.

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 you take the entire exam in pen. The deadline for regrade requests for the midterm is Thursday, August 28th. 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