ECONOMICS 109: GAME THEORY Spring 2020

Instructor: Herb Newhouse (hnewhouse@ucsd.edu) Course webpage: https://canvas.ucsd.edu/
Lectures: MWF 11:00 – 11:50 am Discussions: Th 5:00 – 5:50 pm and 6:00 – 6:50 pm

TAs: Songyu He (soh038@ucsd.edu), Wanchang Zhang (waz024@ucsd.edu), Tanner Eastmond (teastmon@ucsd.edu) and Christian Bechler (cbechler@ucsd.edu)

The instructor and TA office hours will be held online. Further information will be posted on Canvas.

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.

Planned structure:

The topics covered in this course will be presented in a hybrid format, with flexible use of the classroom time and lectures delivered online.

The first lecture will be primarily organizational and administrative. I will also provide you with quick overview about the material we will cover during the second lecture.

Before each lecture, I will ask you to watch the appropriate parts of podcasts from former classes. During that time, I encourage you to fill in the incomplete PowerPoint notes that will be available on Canvas.

At the start of each lecture, I will briefly review the material that was covered in the podcast. During this review you will have the opportunity to ask questions. You will then be given problems to work. You will have the opportunity to ask a TA or me for help with the problems. We will then go over the problems and finish with a quick overview about the material we will cover during the next lecture.

We will do our best to record lectures, discussion sections and review sessions.

Grading:

My prediction of how I will assess you in this course is:

Grades are based on completing a weekly checklist (5%), a week two use of technology quiz (1%), exams (69%) and papers (25%). The weekly checklist is on Canvas. Your score will be based on the percentage of weekly checklists you complete. Your lowest two weeks will be dropped. There will be four exams. Your lowest score will be dropped. There will be two papers.

Note: **If you miss a weekly checklist or exam because of illness, your score for that assignment will be a zero. That assignment will use up one of your drops for that category.** I suggest treating all assignments as if they will count towards your final grade.

Exams will be held during our normal class or final exam times. Midterm 1 will be held on Monday, April 20th. Midterm 2 will be held on Wednesday, May 6th. Midterm 3 will be held on Friday, May 22nd. The final exam will be held on Friday, June 12 during some time period between 11:30 am and 2:30 pm. If you know in advance that you cannot make an exam, please let me know as soon as possible.

While I will do what I can to keep to the predicted assessments for this course, the evolving situation may make it necessary for me to make changes.

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.

We will likely use Zoom or Loom for proctoring this quarter. These programs use video and audio recording or other personal information capture for the purpose of facilitating the course and/or test environment. UC San Diego does not allow vendors to use this information for other purposes. Recordings will be deleted when no longer necessary. However, if cheating is suspected, the recording may become part of the student's administrative disciplinary record. Finally, I reserve the right to give an oral test if I feel it is necessary to uphold academic integrity.

Regrade requests:

Regrade requests may be submitted online during the weeklong regrade period. The regrade period will probably begin a few days after the exam results are made available to the class. Please do not contact the instructor or any of the TAs regarding the grading of an exam or the grading for the course before the regrade period begins. If your TA agrees with your request, your score for that question will be corrected. If your TA disagrees with your request, you will lose 1 point for each midterm question and 2 points for each final exam question.

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