

Economics 109, Game Theory

Spring 2008 Syllabus

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Course description

In this course we will study strategic situations, in which each player's behavior can affect the well-being of the other players. "Strategy" is the process of deciding how to act in these situations, taking into account the likely behavior of the other players. "Game theory" is the study of strategic situations, using a general framework and tools that can be applied across the entire range of situations. In addition to exploring abstract theory, we will also consider a variety of applications from economics, political science, and sports.

Logistics

- Lectures: TTh 9:30–10:50am, Center Hall 105
- Sections with the TAs to review quizzes, practice problems, and lecture material:
 - Wednesdays, 8:00–9:00pm in Solis 104

- Course web site: webct.ucsd.edu

All course announcements and other materials will be posted on WebCT; students are responsible for reading them. No handouts will be distributed in class; please download them yourself.

UCSD students use your regular username and password to log in. You should gain access to the course web site within 48 hours of registering for the course or the waitlist. If you have difficulty accessing the website, contact iwdc@ucsd.edu. For other website issues, please email the head TA.

Audio-only lecture podcasts are at

<http://podcast.ucsd.edu/podcasts/default.aspx?PodcastId=683&v=0>.

- Required textbook: *Strategy: An Introduction to Game Theory*, 2nd. Edition, Joel Watson, New York: W. W. Norton, 2007.

Instructors

There are three approved methods of communicating with the instructors:

1. In person at office hours;
2. By email to the course email address, Econ109UCSD@gmail.com

The TAs will monitor this address. If you want to address your question to a particular TA, write the TA's name in the subject line.

3. On the discussion page of the course website, which is also monitored by the TAs.

All other communications relating to the course will be ignored. In particular, do not send course-related email directly to any of the instructors.

- Professor: David A. Miller. Office hours: Fridays, 2:30–3:30pm in Econ 228
- TA: Tim Keller. Office hours: Tuesdays, 3:30–4:30pm in Sequoyah 140
- TA: Kristy Buzard. Office hours: Wednesdays 2:00–3:00pm in Econ 123

Registering

- Prerequisites: Econ 100A–B (intermediate micro) OR Math 109 (mathematical proofs).
- A friendly suggestion: First take Econ 100C, and then take Econ 109. Don't take them at the same time. You will get more out of both classes that way.
- Exceptions: If you are a graduate student or an exchange student and are unable to register on TritonLink, send an email to Econ109UCSD@gmail.com. No other exceptions will be made.

Assignments

- Weekly quizzes: There will be roughly nine quizzes. You will have a window of several days in which to take each quiz, but once you start a quiz there will be a strict time limit. Each quiz can be worth up to 25 points, with an average of about 15 points. No collaboration is allowed. Quizzes can be found on the course web site. Quiz details will be announced in class and on the website.
- Two midterm exams, in class (150 points each):
 - Tuesday, April 20th
 - Thursday, May 13th
- Final exam (500 points): Tuesday, June 8th, 8:00–11:00am, location TBA.
- Grading: All students are ranked by total points, and a skewed normal distribution is fitted to the data. The curve reflects the advanced, elective nature of the class and accounts for the fact that a disproportionate number of excellent students take the class. Grades are assigned to quantiles of the fitted distribution according to the following cutoffs:

A+ 97%; A 88%; A– 67%; B+ 45%; B 30%; B– 20%; C+ 12%; C 8%; C– 5%; D 3%

If your points total yields a grade of C or lower, you may, at your option, select a D grade instead, to facilitate retaking the course.

- Bonus points: During the course, bonus points are assigned for various optional activities. Bonus points are counted only after the letter grade cutoffs have been assigned. Thus your letter grade will not be hurt if you earn fewer bonus points than your classmates.

Class rules

- Collaboration: No collaboration is allowed on quizzes and exams.

- Electronic devices: Cell phones, computers, music players, and other such devices must be silent during class. No electronic devices may be used for personal entertainment during class.
- Academic honesty: Academic dishonesty is grounds for a reduced or failing grade on the assignment or for the course. Students are reminded of the UCSD Policy on Integrity of Scholarship, at www-senate.ucsd.edu/manual/appendices/app2.htm#AP14.

Lecture outline (lecture notes are organized by unit numbers, on the left)

Part I: Representing Games

1. Introduction (ch. 1)
2. Extensive form (ch. 2)
3. Strategies (ch. 3)
4. Normal form (ch. 3)
5. Beliefs & Mixed strategies (ch. 4)

Part II: Static Settings

6. Rationality & Dominance (first part of ch. 5, first part of ch. 6)
7. Common knowledge & Rationalizability (second part of ch. 5, ch. 7)
8. Location games (ch. 8)
9. Nash equilibrium (best response from ch. 6, ch. 9)
10. Applications of Nash equilibrium (ch. 10)
11. Mixed strategy Nash equilibrium (ch. 11)
12. More mixed strategy Nash equilibrium (ch. 11)

First Midterm Exam

Part III: Dynamic Settings

13. Backward induction & Subgame perfection (chs. 14–15, review ch. 2)
14. Applications of subgame perfection (ch. 16)
15. More applications of subgame perfection
16. Alternating-offer bargaining (ch. 19)
17. More alternating-offer bargaining (ch. 19)
18. Standard bargaining & Negotiation equilibrium (chs. 18, 20–21)
19. Applications of negotiation equilibrium (ch. 21)
20. Finitely repeated games (ch. 22)
21. Infinitely repeated games (chs. 22–23)

Second Midterm Exam

Part IV: Incomplete Information

22. Bayesian Normal form (ch. 24)
23. Bayesian Nash equilibrium (ch. 26)
24. Lemons & Auctions (ch. 27)

- 25. Perfect Bayesian equilibrium (ch. 28)
- 26. Signaling (ch. 29)
- 27. Advanced topics