

Economics 109, Game Theory

Spring 2008 Syllabus

David A. Miller, Assistant Professor of Economics

This version: April 4, 2008

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, Solís Hall 104
- Sections with the TAs to review quizzes, practice problems, and lecture material:
 - Wednesdays, 11:00–11:50am in Center Hall 105
 - Thursdays, 7:00–7:50pm in Center Hall 214
 - Fridays, 4:00–4:50pm in Center Hall 214
- 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 Prof. Miller. Audio-only lecture podcasts are at <http://podcast.ucsd.edu/podcasts/default.aspx?PodcastId=98>.
- Required textbook: *Strategy: An Introduction to Game Theory*, 2nd. Edition, Joel Watson, New York: W. W. Norton, 2007.

The 1st. Edition is on reserve in the SSH Library, until the 2nd. Edition arrives.

The 1st. Edition covers all the relevant material, but lacks the improvements of the 2nd. edition. It also has more errors and a different numbering system for the chapters and exercises.

Professor: David A. Miller

- Email: d9miller@ucsd.edu. Office hours: Mondays 1:00–3:00pm in Econ 228.

Teaching assistants

- Sam Dastrup, sdastrup@ucsd.edu. Office hours Thursdays, 1:00–3:00pm, in Sequoyah 207.
- Ben Horne, bhorne@ucsd.edu. Office hours Tuesdays, 11:00–noon, in Econ 122.
- David Eil, deil@ucsd.edu. Office hours Wednesdays, 2:00–3:00pm, in Sequoyah 238.

Registering

- Prerequisites: Econ 100A–B, Econ 170A–B (intermediate micro), or Math 109.
- Exceptions: If you are a graduate student or an EAP student and are unable to register on TritonLink, contact Prof. Miller. No other exceptions will be made.
- Waitlist: Processed automatically on TritonLink; no add cards.

Assignments

- Weekly quizzes: There will be roughly eight 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 20 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.
- Evening midterm exam: Wednesday, May 7th, 7:00–8:50PM, in Center Hall 214. The midterm, worth 200 points, covers all the material in Units 1–16 of the course.
- Final exam: Tuesday, June 10th, 8:00–11:00am, location TBA. The final, worth 500 points, covers the entire course, but with an emphasis on Parts III–IV.
- Grading: Students are ranked by total points (quizzes + midterm + final), and then letter grade cutoffs are assigned according to a curve. 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.
- 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

- Scheduling conflicts: Since the evening midterm was announced in the Schedule of Classes, it is UCSD policy that students are responsible for avoiding scheduling conflicts. However, if you face one of the following two cases and you notify Prof./ Miller by Monday, April 14, you may take a makeup exam on Thursday, May 8, 8:00–9:20am: (1) You have another course with an overlapping midterm exam, or (2) You have another course that meets once per week during 7:00–8:00pm on Wednesdays.
- 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. Apr. 1: Introduction (ch. 1)
2. Apr. 1: Extensive form (ch. 2)
3. Apr. 3: Strategies (ch. 3)
4. Apr. 8: Normal form (ch. 3)
5. Apr. 8: Beliefs & Mixed strategies (ch. 4)

Part II: Static Settings

6. Apr. 10: Rationality & Dominance (first part of ch. 5, first part of ch. 6)
7. Apr. 15: Common knowledge & Rationalizability (second part of ch. 5, ch. 7)
8. Apr. 15: Location games (ch. 8)
9. Apr. 17: Nash equilibrium (best response from ch. 6, ch. 9)
10. Apr. 22: Applications of Nash equilibrium (ch. 10)
11. Apr. 22: Mixed strategy Nash equilibrium (ch. 11)
12. Apr. 24: More mixed strategy Nash equilibrium (ch. 11)

Part III: Dynamic Settings

13. Apr. 29: Backward induction & Subgame perfection (chs. 14–15, review ch. 2)
14. Apr. 29: Applications of subgame perfection (ch. 16)
15. May 1: More applications of subgame perfection
16. May 6: Prepping for the midterm

• **May. 7: Evening midterm exam, 7:00 to 8:50 PM, Center Hall 214**

15. May 8: Alternating-offer bargaining (ch. 19)
16. May 8: More alternating-offer bargaining (ch. 19)
17. May 13: Standard bargaining & Negotiation equilibrium (chs. 18, 20–21)
18. May 15: Applications of negotiation equilibrium (ch. 21)
19. May 15: Finitely repeated games (ch. 22)
20. May 20: Infinitely repeated games (chs. 22–23)

Part IV: Incomplete Information

23. May 22: Bayesian Normal form (ch. 24)
24. May 27: Bayesian Nash equilibrium (ch. 26)
25. May 27: Lemons & Auctions (ch. 27)
26. May 29: Perfect Bayesian equilibrium (ch. 28)
27. June 3: Signaling (ch. 29)
28. June 3: Advanced topics
29. June 5: Prepping for the final

• **Jun. 10: Final exam, 8:00 to 11:00 AM, location TBA**