Economics 109, Game Theory
Winter 2006 Syllabus

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Logistics

- Course web site: webct.ucsd.edu
  All course announcements will be posted on WebCT; students are responsible for reading them. An updated syllabus, lecture slides, quizzes, bonus activities, and other materials will also be posted. UCSD students use your regular username and password to log in. Extension students, see instructions at http://iwdc.ucsd.edu/students_unex.shtml. You should gain access to the course web site within one business day of registering for the course. If you have difficulty accessing the course, contact iwdc@ucsd.edu. For other website issues, please email Prof. Miller.
- Lectures: TTh 9:30–10:50am, Ledden Auditorium
  Ledden Auditorium is in the middle of the Humanities and Social Sciences Building complex, behind the Applied Physics and Mathematics Building.
- Weekly sections: Wednesdays 5:00–5:50 in Center Hall 115.
  Optional sessions with the TAs to review quizzes, practice problems, and lecture material.
- Required textbook: *Strategy: An Introduction to Game Theory*, Joel Watson, New York: W. W. Norton, 2002, ISBN 0–393–97648–3. On reserve in the SSH Library.

Professor: David A. Miller

- Email: d9miller@ucsd.edu.
- Office hours: Thursdays 1:00–3:00 in Econ 228. Individual meetings by appointment if necessary.

Teaching assistants

- Ben Gillen, bgillen@ucsd.edu. Office hours Mondays 2:00–3:00 in Econ 128.
- TBA

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.

Registering

- Prerequisities: Economics 100A–B or 170A–B (intermediate micro).
- 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.
- Wait list: Processed automatically on TritonLink; no add cards. Historically, all students on the wait list have been able to register for the course.

Assignments

- Weekly quizzes: There will be 7–8 quizzes in all. 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. Most quizzes will be available from Thursday immediately after class until the following Tuesday at 8:00am. Precise times will be announced in class and on the website.
- Midterm exam: Tuesday, February 8th, at our regular class time. The midterm, worth 200 points, covers all the material in Parts I–II of the course.
- Final exam: Thursday, March 20th, 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

- Collaboration: No collaboration is allowed on quizzes and exams.
- Electronic devices: Cell phones, beepers, and other such devices must be turned off during class. Computer games, internet browsing, and music players are not allowed in class, nor are any other electronic devices to be used for personal entertainment during class.
- Academic honesty: The professor and TAs are required to report incidents of suspected cheating to the administration. Cheating will be considered 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 (unit numbers on the left)

Part I: Representing Games

1. Jan. 9: Introduction (ch. 1)
2. Jan. 9: Extensive form (2)
3. Jan. 11: Strategies (3)
4. Jan. 16: Normal form (4)
5. Jan. 16: Beliefs & Expected utility (ch. 5, efficiency from ch. 6)

Part II: Static Settings

6. Jan. 18: Dominance (first part of ch. 6)
7. Jan. 23: Rationalizability (ch. 7)
8. Jan. 23: Location games (ch. 8)
9. Jan. 25: Nash equilibrium (best response from ch. 6, ch. 9)
10. Jan. 30: Applications of Nash equilibrium (ch. 10)
11. Jan. 30: Mixed strategy Nash equilibrium (ch. 11)
12. Feb. 1: More mixed strategy Nash equilibrium (ch. 11)
13. Feb. 6: Prepping for the midterm

- Feb. 8: Midterm exam

Part III: Dynamic Settings

14. Feb. 13: Backward induction & Subgame perfection (chs. 14–15, review ch. 2)
15. Feb. 13: Applications of subgame perfection (ch. 16)
16. Feb. 15: More applications of subgame perfection
17. Feb. 20: Alternating-offer bargaining (ch. 19)
18. Feb. 20: More alternating-offer bargaining (ch. 19)
19. Feb. 22: Standard bargaining & Negotiation equilibrium (chs. 18, 20–21)
20. Feb. 27: Applications of negotiation equilibrium (ch. 21)
21. Feb. 27: Finitely repeated games (ch. 22)
22. Mar. 1: Infinitely repeated games (chs. 22–23)

Part IV: Incomplete Information

23. Mar. 6: Bayesian Normal form (ch. 24)
24. Mar. 6: Bayesian Nash equilibrium (ch. 26)
25. Mar. 8: Lemons & Auctions (ch. 27)
26. Mar. 13: Perfect Bayesian equilibrium (ch. 28)
27. Mar. 13: Signaling (ch. 29)
28. Mar. 15: Prepping for the final

- Mar. 20: Final exam, 8:00 AM