POLI 204C: Introduction to Game Theory
Winter 2016

Instructor: David Wiens
Office: SSB 323
Office hours: W 14:00-17:00
Email: dwiens@ucsd.edu
Web: www.dwiens.com
(password for Google Classroom: j9m0fza)

Course Description

This course is a rigorous introduction to the basic concepts and logic of noncooperative game theory. We will focus on modeling issues and solution concepts. Some familiarity with first-order logic and basic set theory will be essential. The course requirements will not assume mathematical proficiency beyond basic algebra (and maybe some differential calculus).

Course Texts

Lectures will mostly draw on the following texts. The first and third are available from the UCSD bookstore; chs. 1–5 of the second are available on the Google Classroom page. (The third provides crucial background for the course. You should get a copy.)

1. Tadelis, *Game Theory* (Princeton UP, 2013)
2. Watson, *Strategy* (Norton, 3rd ed. 2013)
3. Velleman, *How To Prove It* (Cambridge UP, 2006)

Whether you grasp the salient intuitions behind a concept often depends on how the concept is presented to you. So it is worth checking out other texts for the sake of comparison. Here are some helpful ones.

1. Fudenberg and Tirole, *Game Theory* (MIT Press, 1991)
2. Gibbons, *Game Theory for Applied Economists* (Princeton UP, 1992)
3. Gintis, *Game Theory Evolving* (Princeton UP, 2nd ed. 2009)
4. McCarty and Meirowitz, *Political Game Theory* (Cambridge UP, 2007)
5. Rasmusen, *Games and Information* (Blackwell, 4th ed. 2007)
6. Williams, *Introduction to Game Theory: A Behavioral Approach* (Oxford UP, 2013)

Class Policies

1. Electronic devices (laptops, tablets) are prohibited, unless you secure an exemption from me. Any cell phone that is pulled out during class must be placed face-down on the desk for the remainder of class (excepting emergencies, of course).
2. All problem sets must be typeset — preferably LaTeX, Word accepted — and a hardcopy submitted at the agreed upon time. (I've linked to a comprehensive guide to LaTeX symbols on the course materials page.) Handwritten problems sets will be returned ungraded.
3. Late submissions will accrue a 1 point penalty for every 24 hour period that lapses, starting at 17:00 on the due date.
4. Group work. You are permitted to work together when solving problem sets (sorting out solution strategies, doing scratch work, etc.). However, you are prohibited from submitting jointly written answers — *all submissions must be independently written*. In addition, the first paragraph of each problem set submission must (a) enumerate the other students with whom you worked on the solutions, and (b) give a rough indication of the group members' relative contribution to the solutions. Please note carefully: it is in your interest that you not rely too heavily on others; make sure you have a firm grasp of the logic of the answers. The problem sets are meant to be training exercises for the exams; you will do well on the exams *if and only if you understand the logic of the problem set solutions*.
5. Academic misconduct (e.g., see last item) will be vigorously prosecuted. The academic sanction is an automatic F for the course. The administrative sanction (e.g., suspension, termination) will be determined by the UCSD Academic Integrity Office upon their review of the incident.

Assessment

Do not allocate your effort to maximize your grade; allocate your effort to maximize your understanding.

Scoring for a single problem. Each problem (whether on a problem set or exam) is graded as follows.

Score	Interpretation
✓+	Exceptional (fully meets expectations)
✓	Satisfactory (mostly meets expectations; some minor flaws, but nothing major)
✓−	Unsatisfactory (major flaws)

I won't give detailed comments, but I will clearly indicate where any problems lie. It's up to you to talk to me if you need further clarification about your grade or help understanding particular problems.

Calculating your overall grade. Your total score is the following weighted sum of your aggregate problem set score [Pset], midterm score [M], and final score [F]:

$$\frac{3}{5}[\text{Pset}] + \frac{2}{5}([\text{M}] + [\text{F}])$$

[Pset], [M], and [F] will each be calculated as follows:

$$\frac{P + C\frac{3}{4} + M\frac{1}{4}}{P + C + M},$$

where P is the number of problems on which you receive ✓+; C is the number of problems on which you receive ✓; and M is the number of problems on which you receive ✓−.

Final letter grades are calculated as follows. Let $n = 1, 2, 3, \ldots$ The minimum total score for a letter grade of $A+$ less n steps is 0.9^n. For example, the minimum total score for a $B+ = A+$ less 3 steps is $0.9^3 = 0.729$. (Note: I may revise the formula for calculating these thresholds, depending on how things go. I will revise only if — but not necessarily "if"! — doing so is to your benefit.)

Some explanatory notes. In no particular order:

- The reward for improving from ✓− to ✓ is greater than the reward for improving from ✓ to ✓+. (Equivalently, the penalty for falling short of ✓ is greater than that for falling short of ✓+.)
- The combined number of problems across the two exams will be less than two-fifths of the total number of problems across all problem sets and exams. So there is a slightly lower margin for error on the exams.
- Uniformly satisfactory performance earns you a $B+$; the minimum threshold is $0.9^3 = 0.729$, which is roughly equivalent to averaging ✓ on all problems. A is reserved for consistently exceptional performance; the minimum threshold is 0.9, which is equivalent to receiving ✓+ on at least 80% of all problems (and splitting the remaining problems equally between ✓ and ✓−).

Provisional Schedule

Subject to change.

Week 1 Why models? (Readings on Google Classroom)
Weeks 1/2 (Expected) Utility theory (Tadelis, part 1)
Problem set 1

Weeks 2/3 Model basics (Tadelis, chs. 3, 6 & 7; Watson, chs. 1–5)

— Games with complete information —
Weeks 3/4 Static (Tadelis, chs. 4–6; see also: Watson, chs. 6–11)
>Dominance, Nash equilibrium
Problem set 2

Weeks 5/6 Dynamic (Tadelis, chs. 8–11; see also: Watson, chs. 14–15)
>Subgame perfect equilibrium
Problem set 3
Midterm exam

— Games with incomplete information —
Weeks 7/8 Static (Tadelis, ch. 12)
>Bayesian Nash equilibrium
Problem set 4

Weeks 9/10 Dynamic (Tadelis, chs. 15–17; see also: Gibbons, ch. 4)
>Perfect Bayesian equilibrium, sequential equilibrium
Problem set 5

Final exam