

Syllabus for Poli Sci 118: Game Theory in Political Science

Tuesdays and Thursdays, 3:30-4:50pm in PCYNH 122

Instructor:	Sean Ingham	Office hours: Tu., Th., 8:30-9:30am
Instructor email:	singham@ucsd.edu	Location: SSB 104
Teaching assistant:	Yifan Huang	Office hours: Tu., Th. 11am-12pm
Email:	hyifan@ucsd.edu	Location: SSB 104

Course description

This course introduces students to game theory and its uses in political science. Topics covered include the concepts of Nash equilibrium and subgame perfect equilibrium and their application to the study of electoral competition, collective action problems, and agenda-setting. The goals of the course are to give students a solid understanding of core concepts in game theory and their canonical applications in political science, and to sharpen students' problem-solving and analytical reasoning skills.

Prerequisites

The course has no formal prerequisites and presupposes no mathematical knowledge beyond what is typically taught in high school (there is no calculus, for example). However, the material presents some of the same challenges as mathematics generally: special symbols and notation, abstract concepts, and the difficulty of careful analytical reasoning.

Assignments and grades

The final grade reflects attendance (5%), participation (10%), scores on weekly problem sets (25%), a midterm exam (30%), and the final exam (30%).

Attendance

Attendance will be taken using the Mob Lab platform at the beginning of each class. To avoid any penalty to the participation grade, students must attend all but three of the twenty class sessions during the quarter; the attendance grade is just the number of classes attended divided by seventeen. If a student is sick, has a family emergency, or must miss class for any other reason, there is no need to inform the instructor and request an excused absence. The expectation that such occasions might arise has already been factored into the grading policy, which is why three absences will be excused, no questions asked. The three excused absences should only be used in the case of emergencies. Unfortunately, any circumstances beyond your control that would cause

you to miss four or more classes are probably also circumstances in which you should consider withdrawing from the course.

Participation

Participating means asking questions if something is unclear, venturing answers to questions put to the class, and participating in the polls and games administered over the Mob Lab platform (see below).

Problem sets

There will be about six problem sets. Students are permitted to work on the problem sets in groups, but each student must write up and submit their own solutions, and a student must be prepared to explain their answers to the TA or instructor upon request.

The deadlines for the problem sets are indicated on the schedule below. They are due at the start of class on the day indicated. Late problem sets will not be accepted.

Exams

The midterm exam covers all the material from lectures and the problem sets prior to the date of the exam. The final exam is cumulative and tests all material covered in lectures and the problem sets during the quarter.

Extra credit

There will be a few opportunities for extra credit, such as participation in the games run over the Mob Lab platform and participation in the Omnibus Political Science Survey.

Required materials

We will use Martin Osborne's *An Introduction to Game Theory*. The first three chapters are available on Osborne's website:

<https://www.economics.utoronto.ca/osborne/igt/>

A copy of the textbook will be on reserve at the Geisel Library. If you believe you need your own copy in order to be successful in the course but cannot afford to purchase a copy, please contact me at singham@ucsd.edu.

Mob Lab

We will use the Mob Lab platform to play games and conduct quick polls that test students' comprehension. The software can be installed on a smartphone, tablet, or computer so long as the device has a wifi connection. Participation in these polls and games counts towards a student's participation grade, and the games will also be opportunities to earn extra credit.

UCSD students can sign up for a Mob Lab account at a discounted price of \$15 using the class code 87h5dpbv3.

Here are the steps:

1. Register with MobLab. Go to www.moblab.com.
2. Click ‘Sign Up’ to sign-up for a Student Account. You can also download the MobLab iOS or Android app and create your student account through the app. **IMPORTANT:** To receive credit for your attendance and participation, make sure to use your university email address.
3. Join the Class. Using your browser (you cannot join our class through the app), access the Student Console. Choose Join a Class and enter our Class Code: 87h5dpbv3.

Schedule

- [1] **Jan. 7.** Payoff functions; “rational” actors
- Syllabus
 - Lecture notes (“Lecture 1 - math primer”)
 - Osborne, *Introduction to Game Theory*, 1.1, 1.2
- [2] **Jan. 9.** Concept of a strategic game; the Prisoner’s Dilemma
- Osborne, 2.1, 2.2
- [3] **Jan. 14.** Additional games; concept of a Nash equilibrium
- Osborne, 2.3–2.6
 - **First problem set due**
- [4] **Jan. 16.** Nash equilibria to simple games; stag hunt game
- Osborne, 2.7.1-2.7.4
- [5] **Jan. 21.** Public goods provision; voter participation
- Osborne, 2.7.5-2.7.9
 - **Second problem set due**
- [6] **Jan. 23.** Dominant strategies; voting games
- Osborne, 2.9.1-2.9.4
- [7] **Jan. 28.** Application to empirical inquiry: voter turnout.
- Richard Jankowski. 2018. “Altruism and Political Participation.” In *The Oxford Handbook of Public Choice*, selections tbd.
 - Fowler, James. 2006. “Altruism and Turnout.” *The Journal of Politics* 68(3): 674–683.
 - **Third problem set due**

- [8] **Jan. 30.** Electoral competition
 - Osborne, 3.3, up until Exercise 72.1

- [9] **Feb. 4.** More models of electoral competition
 - Exercise 72.3 (Electoral competition in two districts) in Osborne
 - Exercise 73.1 (candidates who care about location of winning position) in Osborne

- [10] **Feb. 6. Midterm exam**

- [11] **Feb. 11.** Expected utility theory
 - Osborne, 4.1

- [12] **Feb. 13.** Nash equilibria in mixed strategies
 - Osborne, 4.2, 4.3

- [13] **Feb. 18.** Voter turnout, revisited
 - Exercise 118.2 (Voter participation) in Osborne
 - Osborne, 4.6
 - **Fourth problem set due**

- [14] **Feb. 20.** Extensive-form games; strategies in extensive-form games
 - Osborne, 5.1, 5.2

- [15] **Feb. 25.** Nash equilibrium; backwards induction; subgame perfect equilibrium
 - Osborne, 5.3, 5.4

- [16] **Feb. 27.** Ultimatum game; holdup game
 - Osborne, 5.5, 6.1.1, 6.1.2
 - **Fifth problem set due**

- [17] **Mar. 3.** Application to empirical inquiry: experimental tests of altruism
 - Nicholas Bardsley. 2008. “Dictator game giving: altruism or artefact?” *Experimental Economics* 11(2): 122–133.
 - James Andreoni, Justin M. Rao, and Hannah Trachtman. 2017. “Avoiding the Ask: A Field Experiment on Altruism, Empathy, and Charitable Giving.” *Journal of Political Economy* 125(3): 625–653.

[18] **Mar. 5.** Agenda control

- Osborne, 6.1.3

[19] **Mar. 10** Buying votes

- Osborne, 6.3

[20] **Mar. 12** Application to empirical inquiry: money in politics

- Stephen Ansolabehere, John M. de Figueiredo, and James M. Snyder Jr. 2003. “Why is There so Little Money in U.S. Politics?” *Journal of Economic Perspectives* 17(1): 105–130.
- Justin Fox and Lawrence Rothenberg. 2011. “Influence without Bribes: A Noncontracting Model of Campaign Giving and Policymaking.” *Political Analysis* 19:325–341.
- *Optional*: Eleanor Neff Powell and Justin Grimmer. 2016. “Money in Exile: Campaign Contributions and Committee Access.” *Journal of Politics* 78(4): 974–988.
- **Sixth problem set due**