

POLS 515: APPLIED GAME THEORY

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Office hours: Tues 1 - 3pm
in Tarbutton 334

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Class meets Fri 9-12
in Tarbutton 120A

Description

This course strengthens training through the examination of techniques and proofs in canonical formal models in political science. Topics include voting, elections, principal agent models, bargaining, information, political institutions, regime transition/consolidation, political economy, deterrence, conflict, mechanism design, dynamic games, and state formation. Problem sets are designed to help students practice working with various solution concepts, modeling styles, and techniques, e.g., computational simulation. Students will practice working through proofs, anticipating results, teaching, and develop their own model. Prerequisites are POLS 513 and 514.

Learning Objectives

Upon successful completion of this course, students can expect to have gained:

1. Exposure to canonical works.
2. Practice proving and anticipating results, and developing your own model.
3. Experience serving as a professor, referee, and discussant.

What you will do (and grading)

I. Peer Instruction and Participation (35%)

Readings with an asterisk (*) are required. Before class, each student must work through the model (setup, notation, propositions, and proofs) and **explicitly document** the following four-step process:

1. Read the intro, literature review and conclusion. Write down a proposed model, game tree, figures, comparative statics you expect to see (write these down as exactly as you believe they will appear).

2. Read the model setup. Write down the basics: notation, explanations, and all derivations necessary to understand the proof. Now write down a strategy of proof (How would you prove this? What will the best responses look like? Work out what you think will happen.). Finally, write down any propositions and comparative statics you expect to see (write down the exact form as best you can). Note: Do not discuss how you would model things differently.
3. Read the propositions one-by-one and try to prove each one (derive everything, work out every figure, draw extra figures as needed, derive and work through the utility functions and expressions). Whether you solved it or not, work through the proofs in the appendix *their way* – follow each step to understand their technique. Work through all the proofs in the paper (yes, this takes time, your document will not look pristine, and you may not be able to prove everything, but you will get better).
4. Bonus: Can you extend their results? Derive other comparative statics? Work out a numerical example? Do it, plot it, draw it, and figure out what this adds theoretically or substantively. Can you figure out what the (substantive or theoretical) results depended upon? What would have changed if the author(s) removed this assumption?

At the start of each class, two students will be chosen **at random: one will give a chalk talk and the other will turn in their notes** from the above process at the end of class. The presenter must provide the main question, present the model (include proper notation, explain why things were modeled in this way), and take the class through the proofs of the main results (include all derivations) using their notes. During class, students will help each other fill in the blanks and work through the paper. Expect to be called on and expect to be asked new questions during class. *This is difficult, but it will get easier and your intuition will improve.*

Additional readings are recommended for depth.

II. Problem Sets (30%)

Students will complete **three problem sets**. Work through the problems on your own first. Consult notes, textbooks, the web, and each other to verify your approach, strategy for proof, etc., but no free riding – **write your final answers independently**. Complete proofs with proper notation and explanations are expected.

III. Research Project (35%)

Start thinking about your model right away. Aim for the simplest model possible to address a specific question.

- Week 4: **Models due.** Give a 4-6 page double-spaced summary of your motivation, null hypothesis, model set up (premises, preferences of actors, sequence, information, dynamics, etc.) to another student who will serve as a discussant (one per student, and every student is a discussant).
- Week 5: **Student presentations and discussant-led talks.** Each student will have 10 minutes to present their model. Each discussant will have 5 minutes to briefly discuss. As a guideline, the student should describe the motivation, model, and expected results. The discussant should clarify the central question, the main point of the model, what can improve the model and/or what was done well.
- Penultimate week: **Final drafts due by email.** Email your paper to the professor who will distribute your paper to two students who will serve as anonymous referees. Each referee is to submit one-page of feedback to the professor by email before the final class. Referee reports should describe the motivation, central question, contribution, and provide and defend their best critique. If you think something is done well or poorly, you need to explain why.
- Final week: **Student presentations and referee reports due.** Each student will present their model and main result. Referee reports will be distributed by email.

Use the referee reports to improve your paper. **Final papers are due one week after the last class by email.** The paper is to be double-spaced, 12-point font, 7500 words including the Appendix, and TeX is preferred. Include the central question, motivation, null hypothesis, a formal write up of the model, equilibria, propositions, comparative statics, game tree, figures, etc. and note that you will need to make choose which equilibrium to focus on in your discussion and which to relegate to the appendix.

Resources

Math review

- Thompson's A Guide for Young Economists (learn to write a proof and set up a model, intuitively)

- Velleman's How to Prove It: A Structured Approach
- Cupillari's The Nuts and Bolts of Proofs (intro text on proofs and set theory)
- Krantz's Real Analysis and Foundations (recommended if you are confused about sets, sequences, topology, continuity, integration)
- Simon and Blume's Mathematics for Economists (same)
- Sundaram's 1st Course in Optimization Theory (optimization, optimized)

Game theory

1. Osborne's Intro to Game Theory (less technical with some fun problems)
2. Osborne and Rubinstein's A Course in Game Theory (technical, but compact and useful)

Policies

Absences, Late Assignments and Incompletes

* You are allowed one absence (excused or not) without penalty. Each additional absence is 5 points off of your final course grade.

* Late assignments drop a full letter grade – A to B, B to C – per day late without exception.

* No incomplete will be given for this class except under extenuating circumstances. Please speak to the professor well in advance if you anticipate any issues with completing the course.

Academic Integrity

The honor code is in effect throughout the semester. By taking this course, you affirm that it is a violation of the code to cheat on exams, to plagiarize, to deviate from the teacher's instructions about collaboration on work that is submitted for grades, to give false information to a faculty member, and to undertake any other form of academic misconduct. You agree that the teacher is entitled to move you to another seat during examinations, without explanation. You also affirm that if you witness others violating the code you have a duty to report them to the honor council. Any case of suspected academic dishonesty will be reported and managed according to university rules as per the Emory Honor Code:

http://catalog.college.emory.edu/academic/policy/honor_code.html.

Please speak with the professor if you have any questions or concerns.

Electronics

- * Tablets, laptops are unnecessary – writing is probably faster.
- * Cell phone use is not permitted.

Disabilities Services

Emory University is committed under the Americans with Disabilities Act and its Amendments and Section 504 of the Rehabilitation Act to providing appropriate accommodations to individuals with documented disabilities. If you have a disability-related need for reasonable academic adjustments in this course, provide the instructor(s) with an accommodation notification letter from Access, Disabilities Services and Resources office. Students are expected to give two weeks notice of the need for accommodations. If you need immediate accommodations or physical access, please arrange to meet with instructor(s) as soon as your accommodations have been finalized.

Topics

Warming up: Equilibria, Proofs and the Role of Game Theory and Developing Intuition about Democracy

- Read pages 1-70 in William Thomson’s A Guide for the Young Economist. We will discuss it, and go over predicate logic and strategies of proofs.
- *Besley and Coate 1997 “An Economic Model of Representative Democracy”
- *Refresh your memory of various equilibrium concepts (Nash, Subgame perfect, Bayesian, Markov, etc.), complete and perfect information, etc. Also note any topics that you would like to see (multi-player games, principal-agent models, infinite horizon models, etc.). We’ll start with a brief refresher each week and it would help for me to know which topics would benefit you. We’ll have a brief discussion to allow you to request these ideally during this first week (but feel free to bring them up throughout the semester).
- *Feel free to consult Cupillari’s The Nuts and Bolts of Proofs and Velleman’s How to Prove It for more information on this week’s class.

Politicians and Elections

- *Ferejohn 1986 “Incumbent Performance and Electoral Control”
- T. Palfrey. 1984. “Spatial Equilibrium with Entry.”
- Gordon, Huber and Landa 2007 “Strategic Challenger Entry and Voter Learning”

- Baron, DP. 1991 “A Spatial Bargaining Theory of Government Formation in Parliamentary Systems.”
- Baron, DP. 1991 “Government Formation and Endogenous Parties.”
- A. Lupia and K. Strom. 1995. “Coalition Termination and the Strategic Timing of Parliamentary Elections.”
- D. Diermeier and R. Stevenson. 2000. “Cabinet Terminations and Critical Events.”

Role of Third-Parties – Agenda-Setting, Information, and Delegation

- *Gilligan and Krehbiel 1987 “Collective Decisionmaking and Standing Committees: An Informational Rationale for Restrictive Amendment Procedures”
- Bendor and Mierowitz 2004 “Spatial Models of Delegation”
- Laver, Michael, and Shepsle, Kenneth. 1990. “Coalitions and Cabinet Government.”

Principal-Agent Models, Agenda-Setting vs. The Median Voter

- *Romer and Rosenthal 1978 “Political Resource Allocation, Controlled Agendas, and the Status Quo”
- Banks and Sundaram 1993 “Adverse Selection and Moral Hazard in a Repeated Elections Model”
- Shepsle, Kenneth A. 1979. ”Institutional Arrangements and Equilibrium in Multidimensional Voting Models.”
- Orit Kedar. 2005. “When Moderate Voters Prefer Extreme Parties: Policy Balancing in Parliamentary Elections When Moderate Voters Prefer Extreme Parties: Policy Balancing in Parliamentary Elections”

Information, Cheap Talk, and Bargaining

- *Baron and Ferejohn 1989 “Bargaining in Legislatures”
- Crawford and Sobel 1982 “Strategic Information Transmission”
- Austen-Smith 1990 “Information Transmission in Debate”
- S.C. Gordon. 2002. “Stochastic Dependence in Competing Risks”

Voters, Elections, and Policy

- *Fearon 1994 Domestic Audience Costs paper
- Persson and Tabellini 2000 ch 2-3 on models of democracy
- Austen-Smith & Banks 1988 “Elections, Coalitions, and Legislative Outcomes”

- Ramsay 2004 “Politics at the Water’s Edge: Crisis Bargaining and Electoral Competition”

Bargaining and War

- *Fearon’s Bargaining over Discrete Objects paper
- *Powell’s IO on Commitment Problems and War
- Fearon 1995 “Rationalist Explanations for War”
- Powell 2003 “Guns, Butter, and Anarchy”
- Slantchev 2003 “The Principle of Convergence in Wartime Negotiations”
- Powell 2004 “Bargaining and Learning While Fighting”
- Acharya and Ramsay 2013 “The Calculus of the Security Dilemma”

Accountability and Democratic Mechanism Design

- Maskin and Tirole 2004 “The Politician and the Judge: Accountability in Government”
- Carrubba 2009 “A Model of the Endogenous Development of Judicial Institutions in Federal and International Systems”
- EBDM and Landa 2007 “Transparency and Clarity of Responsibility”

Power-sharing in Dictatorships (and Numerical Methods)

- *Svolik 2009 “Power Sharing and Leadership Dynamics in Authoritarian Regimes”
Note: A problem set based on Svolik will be due the following week.

Domestic Politics of Authoritarian Regimes

- *Acemoglu and Robinson ch 4 and 5 from Economic Origins of Dictatorship and Democracy
- Dal Bo and Powell 2009 “A Model of Spoils Politics”
- Persson, Roland, and Tabellini 2000 “Comparative Politics and Public Finance”

Domestic Politics and War

- BDM et al.’s 1999 “An Institutional Explanation of the Democratic Peace”
- Slantchev 2006 “Politicians, the Media, and Domestic Audience Costs”

Collective Action and Endogenous Behavior

- *EBDM 2005 “The Quality of Terror”
- Bendor and Mookherjee 1987 “Institutional Structure and the Logic of Collective Action”
- Fearon and Laitin 1996 “Explaining Interethnic Cooperation”

Regime Transitions, State Formation and Failure

- *Hafer 2006 “On the Origins of Property Rights: Conflict and Production in the State of Nature”
- Kedziora, Jeremy. “Endogenous War Aims and State Resolve” Dissertation chapter.
- Acemoglu and Robinson 2001 “A Theory of Political Transitions”

Experiments and Games

- *Palfrey and Rosenthal 1985 (theory) and Palfrey and Rosenthal 2007 (experiment)
- *James N. Druckman and Arthur Lupia. 2012. “Experimenting with Politics.” *Science* 335: 1177-1179.
- *McDermott, R. 2002. “Experimental Methods in Political Science.”
- *Falk, A. and JJ. Heckman. 2009. “Lab Experiments are a Major Source of Knowledge in the Social Sciences.”
- Arthur Lupia, Logan S. Casey, Kristyn L. Karl, Spencer Piston, Timothy J. Ryan, and Christopher Skovron. 2014. “What Does it Take to Reduce Racial Prejudice in Individual-Level Candidate Evaluations? A Formal Theoretic Perspective.”
- Ostrom, Elinor. 2000. “Collective Action and the Evolution of Social Norms.”
- James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia. 2011. “Experiments: An Introduction to Core Concepts.” In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia (eds.) 2011. *The Cambridge Handbook of Experimental Political Science*. New York: Cambridge University Press, 15-26.
- John H. Aldrich and Arthur Lupia. 2011. “Experiments and Game Theory’s Contributions to Political Science.” In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia (eds.) *The Cambridge Handbook of Experimental Political Science*. New York: Cambridge University Press, 89-101.
- Palfrey, TR. 2009. “Laboratory Experiments in Political Science.”

Data and Games

- *Imai, Kosuke and Dustin Tingley. 2012. “A statistical method for empirical testing of competing theories.”
- *Axelrod, R. 2003. “Advancing the Art of Simulation in the Social Sciences.”
- *Macal, C.M. and Michael J. North. 2005. “Tutorial on Agent-Based Modeling and Simulation.”
- *Signorino, C.S. 2003. “Structure and Uncertainty in Discrete Choice Models.”
- *Imai, Kosuke, Luke Keele, Dustin Tingley, and Teppei Yamamoto. 2011. “Unpacking the black box of causality: Learning about causal mechanisms from experimental and observational studies.”
- Erikson, Robert and Thomas R. Palfrey. 2000. “Equilibria in Campaign Spending Games: Theory and Data.”
- Arthur Lupia and Colin Elman. 2014. “Openness in Political Science: Data Access and Research Transparency.”