

POLITICAL SCIENCE W4209: GAME THEORY AND POLITICAL THEORY (SPRING 2009)

Professor:	Macartan Humphreys	Time:	M & W, 2:40pm-3:55pm
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Overview

W4209 provides a high-level introduction to game theory. We focus on basic concepts and major results of importance for political scientists. It is appropriate for graduate and advanced undergraduate students. Major results from social choice and game theory are covered with applications in the study of collective action, voting, and bargaining. I will assume that students are comfortable with mathematical techniques at the level of Political Science W4360 (Math Methods for Political Science) or intermediate microeconomics.

Requirements

The requirements are:

- 35% A **midterm and a final exam** accounting for 15% and 20% of your grade respectively.
- 35% There will be seven **sets of problems** and exercises to complete throughout the course; these are intended to evaluate your understanding of the material and to allow for deeper exploration of models studied, and, especially, to practice model construction and proof writing. These each account for 5% of the course grade. Dates in which they are due are marked with a ● in the topics table. Late problem sets will not be accepted.
- 20% You will be required to write a **short original paper** or **group project** (undergraduates only) presenting a model, a theorem or simulation. This paper is your key original output from this course. It can be short (10 pages) but should typically motivate a problem, develop a model, prove or demonstrate ensuing propositions, and identify testable predictions. *You may be asked to present parts of your model in class or in the case of games and simulations you may gain a slot in the final days of class to “run” your model if applicable* . The paper is due on 29 April 2008.
- 10% You will be required to participate in **weekly sections** where problem sets will be reviewed, and class and research material will be discussed. The final 10% of the grade will be based on participation in these sections.

Resources

Required Readings are marked with an **R** on the topics table.

- The main coursebook is Martin Osborne’s *An Introduction to Game Theory* which is on order at Book Culture (Labyrinth)
- Other required readings will be available on courseworks
- Send queries and clarifications to your TA who will in most cases respond “publicly”
- For other resources explore <http://www.gametheory.net/> or Al Roth’s excellent page at <http://kuznets.fas.harvard.edu/~aroth/alroth.html>

Topics Table

	Class	Topic	Major Results Covered	Readings (R= Required, O=Optional, O!= Optional & Hard)
Social Choice	W 21 Jan	Rationality and Social Choice	The Condorcet Paradox	R Shepsle K. <u>Analyzing Politics</u> . pp39-81
	M 26 Jan	The Problem of Social Choice	Arrow's Theorem Paretian Liberals	O! Geanakoplos, John, 2001. <u>Three Brief Proofs of Arrow's Impossibility Theorem</u> O Sen, A. 1970. " <u>The Impossibility of a Paretian Liberal.</u> " <u>JPE</u> 78:1, pp. 152-57.
	W 28 Jan	Majority Voting	The Median Voter Theorem Plott's Theorem, May's Theorem	R Miller NR, B Grofman, SL Feld - <u>Journal of Theoretical Politics</u> , 1989. The Geometry of Majority Rule
	M 2 Feb	Preference Revelation	The Gibbard-Satterthwaite Theorem	O! Taylor AD. The Manipulability of Voting Systems. <u>AMM</u> , 109(4) 2002
Normal Form Games	W 4 Feb ●	Intro to Normal Form Games	The Tragedy of the Commons	R Osborne 2 & 3
	M 9 Feb	Solving Normal Form Games		
	W 11 Feb	Risk	The Expected Utility Theorem	R Osborne 4.12 O Von Neumann and Morgenstern, <u>Theory of Games and Economic Behavior</u> , Ch 3.
	M16 Feb ●	Mixed strategies I	Minimax theorem, Nash's Theorem	R Osborne, Chs 4
	W18 Feb	Mixed strategies II	Harsanyi's Purification Theorem	O! Srihari, Reny, & Robson. A short proof of Harsanyi's purification theorem. <u>GEB</u> 2003.
	M 23 Feb	Other solution concepts and the cooperative approach	Correlated Equilibrium, Strong Equilibrium, Shapley values, CPNE	R Osborne Ch 12
Extensive Form Games	W25 Feb	Extensive Form Games	Kuhn's Theorem, Zermelo's Theorem	R Osborne, Chs 5, 6
	M 2 Mar ●	Subgame Perfection		
	W 4 Mar	Agenda Setting	The Setter Problem	R Osborne Ch 7
	M 9 Mar	Applications to Bargaining	Stahl-Rubinstein bargaining Bargaining in Legislators	R Osborne Ch 16.1 R Baron D and J Ferejohn. 1989. " <u>Bargaining in Legislatures.</u> " <u>APSR</u> 83: 1181-1206.
	W 11 Mar	<i>In class exam</i>		
	M23 Mar ●	Repeated Games I	The Discounted Utility model The Folk Theorems	R Osborne, Ch. 14, 15
	W25 Mar	Repeated Games II	Cooperation and Groups	R Fearon J, and D Laitin. 1996. "Explaining Interethnic Cooperation," <u>APSR</u> , 90:715-735.
	M 30 Mar	Incomplete information I	Bayes' Rule The Harsanyi Representation	R: Osborne Ch 9
Incomplete Information	W 1 Apr	<i>No Class</i>		
	M 6 Apr ●	Incomplete information II	Perfect Bayesian Equilibrium	R: Osborne Ch 10
	W 8 Apr	Accountability and Bargaining	The Myerson-Satterthwaite Theorem	O! Myerson & Satterthwaite, 1983. Efficient mechanisms for bilateral trading <u>JET</u> 28.
	M 13 Apr	Auctioning	The Revenue Equivalence Theorem	R P Klemperer. 2000. <u>Auction Theory: A Guide to the Literature</u>
	W 15 Apr	Common Knowledge	Aumann's Agreement Theorem	R Geanakoplos, J Common Knowledge 1992. <u>Journal of Economic Perspectives</u> 6(4)
Topics	M 20 Apr ●	Evolution I	Evolutionarily Stable Equilibrium	R Osborne Ch 13
	W 22 Apr	Evolution II	The Bishop-Cannings theorem	O Brian Skyrms, 1996. <u>Evolution of the Social Contract</u> . Cambridge University Press.
	M 27 Apr	Games and Experiments		R Camerer & Fehr. <u>Measuring Social Norms and Preferences Using Experimental Games</u> O Goeree, Holt. <u>Ten Little Treasures of Game Theory and Ten Intuitive Contradictions</u> .
	W 29 Apr	Class Presentations		
	M 4 May ●	Class Presentations		