

POLITICAL SCIENCE W4209: GAME THEORY AND POLITICAL THEORY (SPRING 2008)

Professor:	Macartan Humphreys	Time:	Tuesdays and Thursdays, 4:10pm-5:25pm
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Overview

This course provides a high-level introduction to game theory. The focus of the course will be on basic concepts and major results of importance for political scientists. It is intended for doctoral students in political science, but it is also appropriate for other students with an interest in the formal study of political institutions and a background in microeconomics. 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. Students will be required to develop a topic relating political science and game theory and to write a short formal research paper.

Requirements

The requirements are as follows:

- 40% A **midterm and a final exam** each accounting for 20% of your grade.
- 30% There will be six **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 (Labarynth)
- Other required readings will be available on courseworks
- Queries and Clarifications should be sent to your assigned TA who will in most cases respond to the queries "publicly"
- For other resources online you can 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)
Social Choice	22 Jan	Rationality and Social Choice	The Condorcet Paradox	
	24 Jan	The Problem of Social Choice	Arrow's Theorem The Impossibility of a Paretian Liberal	O Geanakoplos, John, 2001. Three Brief Proofs of Arrow's Impossibility Theorem O Sen, Amartya. 1970. " The Impossibility of a Paretian Liberal. " JPE 78:1, pp. 152-57.
	29 Jan	<i>Voting</i> : Continuous outcome spaces and majority rule	The Median Voter Theorem Plott's Theorem	R NR Miller, B Grofman, SL Feld - Journal of Theoretical Politics, 1989. The Geometry of Majority Rule
	31 Jan	Preference Revelation	The Gibbard-Satterthwaite Theorem The Duggan-Schwartz Theorem	O Alan D. Taylor. The Manipulability of Voting Systems. <i>The American Mathematical Monthly</i> , Vol. 109, No. 4. (Apr., 2002), pp. 321-337.
Normal Form Games	5 Feb ●	Introduction to Normal Form Games	The Tragedy of the commons and other Collective Action Problems	R Osborne 2 & 3
	7 Feb	Solving Normal Form Games		
	12 Feb	Studying Risk	The Expected Utility Theorem	O Von Neumann and Morgenstern, <i>Theory of Games and Economic Behavior</i> , Chapter 3.
	14 Feb	Mixed strategies I	The Minimax theorem, Nash's Theorem Glicksberg's theorem	R Osborne, Chs 4
	19 Feb ●	Mixed strategies II	Rational Voting Harsanyi's Purification Theorem	O Harsanyi, John C.. 1973. "Games with randomly disturbed payoffs: a new rationale for mixed-strategy equilibrium points." <i>Int. J. Game Theory</i> 2 (1973), pp. 1-23.
	21 Feb	Other solution concepts	Rationalizability, Correlated Equilibrium and Strong Equilibrium	R Osborne Ch 12
Extensive Form Games	26 Feb ●	Extensive Form Games	Kuhn's Theorem, Zermelo's Theorem	R Osborne, Chs 5, 6
	28 Feb	Subgame Perfection I		
	4 Mar	Applications to Agenda Setting	The Setter Problem	R Osborne Ch 7
	6 Mar	No class		
	11 Mar	Applications to Bargaining	Stahl-Rubinstein bargaining Bargaining in Legislators	R Osborne Ch 16.1 R D Baron and J Ferejohn. 1989. " Bargaining in Legislatures. " <i>APSR</i> 83: 1181-1206.
	13 Mar	In class exam		
	25 Mar	Repeated Games I	The discounted utility model The Folk Theorems	R Osborne, Ch. 14, 15
	27 Mar	Repeated Games II	The Evolution of Cooperation Cooperation within Groups	R J Fearon, and D Laitin. 1996. " Explaining Interethnic Cooperation. " <i>APSR</i> , 90:715-735.
Incomplete Information	1 Apr ●	Games of Incomplete information I	Bayes' Rule The Harsanyi Representation	R: Osborne Ch 9
	3 Apr	Games of Incomplete information II	Perfect Bayesian Equilibrium	R: Osborne Ch 10
	8 Apr	Accountability and Bargaining	The Myerson-Satterthwaite Theorem	O Myerson and Satterthwaite, 1983. "Efficient mechanisms for bilateral trading." <i>JET</i> 28.
	10 Apr	Auctioning	The Revenue Equivalence Theorem	R P Klemperer. 2000. Auction Theory: A Guide to the Literature <i>Economic Theory of Auctions</i>
	15 Apr ●	Common Knowledge	Aumann's Agreement Theorem	R John Geanakoplos Common Knowledge 1992. <i>The Journal of Economic Perspectives</i> 6(4)
Topics	17 Apr	Evolution I	Evolutionarily Stable Equilibrium	R Osborne Ch 13
	22 Apr	Evolution II	The Bishop-Cannings theorem	O Brian Skyrms, 1996. <i>Evolution of the Social Contract</i> . Cambridge University Press.
	24 Apr	Behavioral Game Theory		R CF Camerer, E Fehr Measuring Social Norms and Preferences Using Experimental Games
	29 Apr ●	Class Presentations		
	1 May	Class Presentations		