

Fall 2009

POS 598: Game Theory

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Course Description

This course is an introduction to basic concepts and techniques of game theory and their use in political science research. Game theory provides a mathematical framework for analyzing strategic interaction. Knowledge of game theory is becoming essential to young political scientists as game theoretic approaches have become an important tool in modern political science.

The goal of this course is to get students familiar with the basic tools and frameworks of game theoretic models, and to enable them to become informed readers of the growing body of literature using game theoretic approach. This course is intended for graduate students in political science but is also appropriate for students from other social science fields interested in formal modeling.

We will focus primarily on noncooperative game theory, including the concepts of Nash equilibrium, subgame perfection and other equilibrium refinements, games of incomplete and imperfect information, repeated games and bargaining. We will also look at particular applications of game theory in the political science literature, such as electoral and legislative behavior, international security, ethnic cooperation and lobbying.

Grading

1) Problem sets: 30%

Problem sets will be distributed on Thursdays. They are due the following Tuesdays in class. Students may discuss problem sets with other students, but are encouraged to solve them on their own.

2) Presentation and class participation: 20%

Articles marked with * will be assigned to students to make presentations in class. Each presentation is expected to last for about 30 minutes.

3) Mid-term and final exams: 50%

Mid-term and final exams will be given in class on October 15 and December 3, respectively. They are non-cumulative, and exam questions will come from the problem sets. Both the mid-term and final exams will be closed book.

Text Books

- Nolan McCarty and Adam Meirowitz. 2007. *Political Game Theory: An Introduction*. Cambridge: Cambridge University Press.
- James D. Morrow. 1994. *Game Theory for Political Scientists*. Princeton: Princeton University Press.
- Peter C. Ordeshook. 1986. *Game Theory and Political Theory: An Introduction*. Cambridge: Cambridge University Press.

Journal Articles

- David Austen-Smith and Jeffrey Banks. 1988. Elections, Coalitions, and Legislative Outcomes. *American Political Science Review*, Vol. 82, No. 2, pp. 405-422
- David Austen-Smith and Jeffrey Banks. 1996. Information Aggregation, Rationality, and the Condorcet Jury Theorem. *American Political Science Review*, Vol. 90, No. 1, pp. 34-45
- David Austen-Smith and William H. Riker. 1987. Asymmetric Information and the Coherence of Legislation. *American Political Science Review*, Vol. 81, No. 3, pp. 897-918
- David Austen-Smith and John R. Wright. 1994. Counteractive Lobbying. *American Political Science Review*, Vol. 38, No. 1, pp. 25-44
- Jeffrey S. Banks. 1990. Equilibrium Behavior in Crisis Bargaining Games. *American Journal of Political Science*, Vol. 34, No. 3, pp. 599-614
- David P. Baron. 1991. Majoritarian Incentives, Pork Barrel Programs, and Procedural Control. *American Journal of Political Science*, Vol. 35, No. 1, pp. 57-90
- David P. Baron and John A. Ferejohn. 1989. Bargaining in Legislatures. *American Political Science Review*, Vol. 83, No. 4, pp. 1181-1206
- James D. Fearon. 1994. Domestic Political Audiences and the Escalation of International Disputes. *American Political Science Review*, Vol. 88, No. 3, pp. 577-592
- James D. Fearon and David D. Laitin. 1996. Explaining Interethnic Cooperation. *American Political Science Review*, Vol. 90, No. 4, pp. 715-735
- Timothy Feddersen and Wolfgang Pesendorfer. 1998. Convicting the Innocent: The Inferiority of Unanimous Jury Verdicts under Strategic Voting. *American Political Science Review*, Vol. 92, No. 1, pp. 23-35
- Barbara Geddes. 1991. A Game Theoretic Model of Reform in Latin American Democracies. *American Political Science Review*, Vol. 85, No. 2, pp. 371-392
- Avner Greif, Paul Milgrom and Barry R. Weingast. 1994. Coordination, Commitment, and Enforcement: The Case of the Merchant Guild. *Journal of Political Economy*, Vol. 102, No. 4, pp. 745-776
- Duncan Snidal. 1985. Coordination versus Prisoners' Dilemma: Implications for International Cooperation and Regimes. *American Political Science Review*, Vol. 79, No. 4, pp. 923-942
- Terry Sullivan. 1990. Bargaining with the President: A Simple Game and New Evidence. *American Political Science Review*, Vol. 84, No. 4, pp. 1167-1195

Course Outline and Schedule

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| August 25 | <p>Introduction</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 1, Chapter 12 ▪ Morrow: Chapter 1, Appendix 1 |
| August 27 | <p>Utility Theory</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 2 (2.1, 2.3, 2.5) ▪ Ordeshook: Chapter 1 (1.1, 1.2, 1.3) ▪ Morrow: Chapter 2 |
| September 1, 3 | <p>Choice under Uncertainty</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 3 (3.1, 3.2, 3.3, 3.5) ▪ Ordeshook: Chapter 1 (1.4, 1.5) ▪ Morrow: Chapter 2 |
| September 8 | <p>Games in the Normal Form I (Normal-form Games and Nash Equilibrium in Pure Strategies)</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 5 (5.1, 5.2) ▪ Ordeshook: Chapter 3 (3.3, 3.4, 3.5, 3.6) ▪ Morrow: Chapter 3, Chapter 4 |
| September 10 | <p>Games in the Normal Form II (Existence of NE, Mixed Strategies)</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 5 (5.4, 5.5) ▪ Ordeshook: Chapter 3 (3.7, 3.8) ▪ Morrow: Chapter 4 |
| September 15 | <p>Games in the Normal Form III (Calculating NE, Applications)</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 5 (5.6, 5.7, 5.8, 5.9, 5.12, 5.13) ▪ Morrow: Chapter 4 |
| September 17 | Snidal (1985)*, Geddes (1991)* |
| September 22 | <p>Games in the Extensive Form I (Backward Induction, Subgame Perfection)</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 7 (7.1, 7.2, 7.3, 7.4) ▪ Ordeshook: Chapter 3 (3.2, 3.9) ▪ Morrow: Chapter 5 |
| September 24 | <p>Games in the Extensive Form II (Applications)</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 7 (7.5, 7.6, 7.7, 7.8) |
| September 29 | Austen-Smith and Banks (1988)*, Sullivan (1990)* |
| October 1 | <p>Bayesian Games in the Normal Form I (Bayesian Game and Applications)</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 6 (6.1, 6.2, 6.3, 6.4) ▪ Morrow: Chapter 6 |
| October 6 | <p>Bayesian Games in the Normal Form II (Existence of Bayesian NE and Applications)</p> <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 6 (6.5, 6.6, 6.7, 6.8) |
| October 8 | Austen-Smith and Banks (1996)*, Feddersen and Pesendorfer (1998)* |
| October 13 | Review |
| October 15 | Mid-term exam |
| October 20 | Dynamic Games of Incomplete Information I (Perfect Bayesian |

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| | Equilibria, Signaling Games and Cheap Talk) <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 8 (8.1, 8.2) ▪ Morrow: Chapter 6, Chapter 8 |
| October 22 | Dynamic Games of Incomplete Information II (Applications) <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 8 (8.3, 8.4, 8.5) ▪ Morrow: Chapter 6, Chapter 8 |
| October 27 | Perfect and Sequential Equilibria <ul style="list-style-type: none"> ▪ Morrow: Chapter 7 ▪ McCarty and Meierowitz: Chapter 8 (8.6) |
| October 29 | Austen-Smith and Wright (1994)*, Austen-Smith and Riker (1987)* |
| November 3 | Repeated games I (Repeated Prisoner's Dilemma, Tit-for-Tat, Punishment) <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 9 (9.1, 9.2, 9.3, 9.4) ▪ Ordeshook: Chapter 10 (10.1) ▪ Morrow: Chapter 9 |
| November 5 | Repeated games II (Folk Theorem, Finitely Repeated Games, Stationarity) <ul style="list-style-type: none"> ▪ Morrow: Chapter 9 ▪ McCarty and Meierowitz: Chapter 9 (9.5) ▪ Ordeshook: Chapter 10 (10.3) |
| November 10 | Fearon and Laitin (1996)*, Greif, Milgrom and Weingast (1994)* |
| November 12 | Bargaining Theory I (Nash Bargaining Solution, Noncooperative Bargaining) <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 10 (10.1, 10.2, 10.3) ▪ Morrow: Chapter 4, Chapter 5 |
| November 17 | Baron and Ferejohn (1989)*, Baron (1991)* |
| November 19 | Bargaining Theory II (Bargaining with Incomplete Information and its Applications) <ul style="list-style-type: none"> ▪ McCarty and Meierowitz: Chapter 10 (10.5, 10.6, 10.7) ▪ Morrow: Chapter 8 |
| November 24 | Banks (1990)*, Fearon (1994)* |
| December 1 | Review |
| December 3 | Final exam |