

Social Choice and Game Theory (POLS 608 and 703)
WF 2:00-3:15 109 Blake

Paul Johnson
518 Blake (864-9086)
Office Hours: TR 2:00-4:00 & by appointment

Course Purpose:

To provide a survey of the basic methods and results of "rational choice" theory.

Grades:

All students in POLS 608 and 703 will be required to complete a set of exercises and examinations. For 608 students, grades will be based on 90-80-70-60 division of the 100 point scale, but there are 105 points possible.

Participation and class attendance (10 points). A person who always attends and does not participate meaningfully earns 7.

Writing Assignments (45 points). Three creative writing assignments (5-10 pages in length) worth 15 points each will be due 10 days after they are distributed in class.

Homework Exercises (5 points).

Midterm Examination (15 points).

Final Examination (30 points).

Students in 703 (graduate students should enroll in this one) will have additional reading assignments and writing exercises that will amount to an additional 30 points possible (grades based on 130 possible points). There will be 1 hour bi-weekly meetings (probably during lunchtime) of the students enrolled in 703.

Web Page:

I've not invested much effort in Web material for this class, but you can find copies of the syllabus, assignments, and some reading materials at <http://pj.freefaculty.org/ps608>.

Readings:

At the bookstore:

Paul E. Johnson, *Social Choice: Theory and Research*

Avinash K. Dixit and Susan Skeath, *Games of Strategy, 2ed*

Downloadable items include:

Paul E. Johnson, "Chapter 3: Voting Systems", <http://pj.freefaculty.org/ps608>

Weekly Schedule for Everybody

Note: Readings with an asterisk (*) are optional additional readings that I think would be helpful.

1. Introduction (Aug. 22)

2. Basic preference concepts. (Aug. 27)

Johnson, *Social Choice: Theory and Research*, pp. 1-11.

3. The Plurality Problem and Majority Rule (Aug 29)

Johnson, "Voting Systems," sections 1-3

EXERCISES: 3.3.1, 3.3.3, 3.3.5

+POLS 703: William Riker, *Liberalism Against Populism*, Ch. 3.

Methods and Criteria for three or more alternatives

4. Borda and Positional Methods. (Sep. 3)

Johnson, "Voting Systems," section 4.

EXERCISES: 3.4.1-3.4.5

+POLS703: William Riker, *Liberalism Against Populism*, Ch. 4.

There is a ton of stuff on the internet. These are fun! Really!

Erika Klarreich, "Election Selection: Are we using the worst voting procedure?" *Science News*, Vol. 162 (18) November 2, 2002. Available online <http://www.sciencenews.org>
(<http://www.sciencenews.org/articles/20021102/bob8.asp>)

Dana Mackenzie, "May The Best Man Lose", *Discover*, 21(11), Nov. 2000. Online:
(<http://www.discover.com/issues/nov-00/features/featbestman/>)

Dana Mackenzie, "Making Sense Out of Consensus", *SIAM News*, Vol. 33, October 2000 (<http://www.siam.org/siamnews/10-00/consensus.htm>)
<http://www.siam.org/siamnews/04-01/letter.htm>

5. Pairwise methods (Condorcet extensions) (Sep. 5)

Johnson, "Voting Systems", Section 5

EXERCISES: 3.5.1-3.5.4

6. Condorcet Extensions (Sep. 10)

Johnson, "Voting Systems", Sections 6

EXERCISES: 3.6.1, 3.6.3, 3.6.4-3.6.6

7. Single Transferrable Vote (Sep. 12)

Johnson, "Voting Systems", Section 7-8

EXERCISES 3.7.1-3.7.3

8. Arrow's Theorem: Axiomatic Structure (Sep. 17)

Johnson, *Social Choice: Theory and Research*, pp. 12-16
 Alfred MacKay, Ch. 2, "Four Conditions on Rational Social Choice," *Arrow's Theorem: The Paradox of Social Choice* New Haven: Yale University Press, 1980, pp. 13-48.

9. Arrow's Theorem: Proof & Implications (Sep. 19)

Johnson, *Social Choice: Theory and Research*, pp. 16-30.
 *Optional: There is a nice treatment in William Riker, *Liberalism Against Populism*, Ch. 5

10. Agenda Power in Finite Sets of Alternatives (Sep. 24)

William Riker, *The Art of Political Manipulation*, "Ch. 3, The Flying Club".
 *Optional: William Riker, *Liberalism Against Populism*, Ch. 7A&B).

11. Preferences on the Continuum (Sep. 26)

Johnson, *Social Choice: Theory and Research*, pp. 31-49.
WRITING ASSIGNMENT 1 DUE

12. One Dimensional Spatial Model (Oct. 1)

Johnson, *Social Choice: Theory and Research*, pp. 49-59
 *Optional: Anthony Downs, *Economic Theory of Democracy*, is a classic reference

13. The Basic Multidimensional Model; Spherical & Quadratic Preferences; Generalizations (Oct. 3)

Johnson, *Social Choice: Theory and Research*, pp. 60-77
 *Optional: William Riker, *Liberalism Against Populism*, Ch. 7C,D & E.

14. The Chaos Results (Oct. 8)

Johnson, *Social Choice: Theory and Research*, pp. 77-80
 *Optional: Michael Laver & Norman Schofield, "Coalition Formation in a Multidimensional Policy Space," *Multiparty Government: The Politics of Coalition in Europe* (Oxford University Press, 1990), pp. 121-128.
 *Optional: Peter Ordeshook, *Game Theory and Political Theory*, Ch. 1.1-1.4 (utility theory), Ch. 2.3 (instability), Ch. 4.5-4.8.

15. Why So Much Stability? (Oct. 10)

Paul Johnson, *Social Choice: Theory and Research*, pp. 80-96.
 +POLS 703: Kenneth Shepsle and Barry Weingast. 1981. Structure-induced equilibrium and legislative choice. *Public Choice* 37: 503-519.

If there is time, I want to give a brief talk on the findings about Parliamentary Government as examples of "structure induced equilibrium". Interested students might consult the following:

Kenneth Shepsle and Mark Bonchek, *Analyzing Politics*, Ch. 16 "Cabinet Government and Parliamentary Democracy," pp. 432-456.
 Michael Laver & Kenneth Shepsle "Coalitions and Cabinet Government," *American Political Science Review* 84 (Sept. 1990): 873-891.

16. TEST (Oct. 15)

Fall Break

17. Introduction to Game Theory (Oct. 22)
 Dixit and Skeath, *Games of Strategy*, 2ed, Chapter 1 -2.
 +POLS 703: Gates and Humes, "Ch.1 Modeling with Games"

18. More Terminology. (Oct. 24)

Catch up on reading!
 I'm going to try to explain the von Neumann/Morgenstern utility function.
 *Optional: Morton Davis, *Game Theory* "Ch. 4, Utility Theory," pp. 57-74.

19. Extensive Form Games (Oct. 29)

Dixit and Skeath, Chapter 3
 EXERCISES: D&S p. 78, 1, 2, 3.
 *David Kreps, *Game Theory and Economic Modelling*, pp.9-21.

20. Dominance and Nash Equilibrium (Oct. 31)

Dixit and Skeath, Chapter 4 (you can ignore the part on "minimax")
 EXERCISES: D&S 1, 3, 6
 Robert Powell, *Nuclear Deterrence Theory*, "Best Replies & Nash Equilibria," pp. 196-201.

*Optional: A.K. Dixit and Barry Nalebuff, *Thinking Strategically*, "Seeing Through...", pp. 56-80
 *Optional: Peter Ordeshook, *Game Theory and Political Theory*, 3.5-3.8.
 *Optional: David Kreps, *Game Theory and Economic Modelling*, pp.26-28 (Dominance) pp. 28-36 (Nash Equilibrium).

21. Nash Equilibrium Reconsidered (Nov. 5)

Dixit and Skeath, Chapter 5

22. Sequential and Simultaneous games: Equivalence? (Nov. 7)

Dixit and Skeath, Chapter 6
 EXERCISES: D&S p. 114, 1, 3

*Maybe you are confused & bewildered. It may help you to check some other books that cover the same material, such as:
 Gates and Humes, "Ch 2: A Brief Introduction to Game Theoretic Models".
 David Kreps, *Game Theory and Economic Modelling*, "Basic Notions..." pp. 21-25.
 Robert Powell, *Nuclear Deterrence Theory*, p. 187-196, 201-204.
 A.K. Dixit and Barry Nalebuff, *Thinking Strategically*, "Strategic Moves," and "Credible Commitments," pp. 119-167

Peter Ordeshook, *Game Theory and Political Theory*, Ch. 3.9.
 David Kreps, *A Course In Microeconomic Theory*, "12.7 Refinements of Nash Equilibrium,"
 "12.7.1 Weak Dominance" & "12.7.2 Subgame Perfection," pp. 417-425.

23. Nash Equilibrium--Mixed Strategies (Nov. 12)

Dixit and Skeath, Chapters 7 – 8 (As far as I'm concerned, Chapter 7 can be skimmed because we have no interest in zero-sum games per se. However, you should not skip it completely because it has the VITAL APPENDIX on utility and risk).
 EXERCISES: D&S, Chapter 8, p. 258, 1, 2

24. Game Theory's Greatest Hits (Nov. 14)

David Kreps, *Game Theory and Economic Modelling*, "Taxonomy based on the strategic form" pp. 37-41.
 George Tsebelis, *Nested Games: Rational Choice in Comparative Politics*, "Ch. 3.2 Some Simple Two-By-Two Games," pp. 61-68.
 EXERCISES: Game Theory Handout Exercise #1

25-26. "Imperfect" information, Beliefs, Perfect Bayesian Equilibrium (Nov. 19-21)

Dixit and Skeath, Chapter 9, "Uncertainty and Information"
 EXERCISES: D&S, p. 296, 4
 +POLS703: David Kreps, *A Course In Microeconomic Theory*, "12.7.3 Sequential Equilibrium" pp. 425-437 "13.1 Games of Incomplete Information," pp. 463-468, "13.3 Modeling Irrationality," pp. 480-489..
 +POLS703: Robert Powell, *Nuclear Deterrence Theory*, "Sequential Equilibria," pp. 204-213 and "Games of Incomplete Information," pp. 213-220.

27. Credibility: Threats, Promises, and Irrationality (Dec. 3)

Dixit and Skeath, Chapter 10, "Strategic Moves"

28. Repeated Games (emphasizing the Iterated Prisoner's Dilemma) (Dec. 5)

Dixit and Skeath, Chapter 11. "Prisoners' Dilemma & Repeated Games"
 EXERCISES: Game Theory Handout Exercise #2

29. Collective action/large N problems (Dec. 10)

Dixit and Skeath, Chapter 12 "Collective Action Games"
 *Optional: A.K. Dixit and Barry Nalebuff, *Thinking Strategically*, "Cooperation and Coordination," pp. 223-258

Weekly Schedule for Graduate Students

We will meet 6 times separately from the undergraduate 608 students. These meetings will last 60 minutes and will be focused on a review of classic material in rational choice and game theory. If you have read these books before, read again!

Before we meet to discuss a book, I want you to summarize your thoughts by creating 2 lists. Copy your lists for all of your classmates and the teacher. 1) A list of good and useful aspects of this material and 2) A list of bad things, or things you think should be improved.

Writing assignment: For three of these sessions, you must shape and beautify your lists into a well written, 5-10 page essay. These are due one week after we meet. No late papers will be accepted. Since you are allowed to choose any 3 of these, it is up to you to organize your time properly.

1. Anthony Downs, *Economic Theory of Democracy*, New Haven: Yale University Press, 1951
2. Duncan Black, *Theory of Committees and Elections*. Cambridge: Cambridge University Press, 1953
3. Gary Cox, *Making Votes Count: Strategic Coordination in the World's Electoral Systems*. New York: Cambridge University Press, 1997.
4. Collective action supplement:
 - Mancur Olson, *The Logic of Collective Action*. Cambridge: Harvard University Press, 1964, Chapters 1 & 6 are sufficient. Glance through his ridicule of Marxism and Political Science if you like.
 - Thomas Schelling, *Micromotives and Macrobehavior*. New York: Norton, 1978 Chapter 7
 - Garrett Hardin, "The Tragedy of the Commons," *Science*, vol. 162 (1968), p. 1243-1248.
5. Robert Axelrod, either the 1981 APSR article "Emergence of Cooperation among Egoists" (75:306-18) or the much longer and more verbose version of the same in the book *The Evolution of Cooperation*. New York: Basic Books, 1984
6. ? To be decided.