

Political Science 631: Deductive and Analytical Approaches

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Class Room: Social Psychology 127
Class Time: Tue/Thu 10:05-11:20am
Office Hours: Wednesday 11am-noon
Thursday 3-4pm

COURSE OVERVIEW

Game theoretic models have become a standard analytical tool in political science research. As a result, it is crucial for graduate students in political science to acquire at least a basic familiarity with game theoretic methods. The purpose of this class is to provide an introduction to game theoretic modeling, focusing in particular on non-cooperative game theory. By the end of the semester, students should be at a skill level that allows them to be intelligent consumers of applied game theoretic research as found in the major disciplinary journals and to construct simple models for applied research. While this class does not presume any mathematical background beyond basic algebra and calculus, it is important to stress that game theory is a deductive, mathematical enterprise. Therefore, it requires abstract, symbolic reasoning. The only way to learn these skills is to practice them. You cannot learn game theory by solely listening to class lectures. You should diligently work through class notes, assigned reading, and homework.

TEACHING ASSISTANT

Victoria Dounoucos will serve as teaching assistant for this course. In addition to me, you can contact her with questions you may have, to go over homework assignments, etc.. Victoria will hold office hours on Mondays from 1pm to 3pm. *Please make every effort to limit your requests for help to office hours.* Like you, Victoria is a graduate student, and I would like to make sure that we are all respectful of her time. You can reach her via email at victd91@vt.edu.

REQUIRED READINGS

There is one required textbook, available at the campus bookstore and through a variety of online retailers:

Martin Osborne. 2004. *An Introduction to Game Theory*. Oxford University Press.

Additional required readings are available through the **Sakai page** for this course, as well as through the electronic resources available through Duke Library. See the semester schedule below for details.

In general, I would encourage you to work through the assigned sections of the textbook after we have covered the material in class. In my experience, doing things in this order is most helpful in reinforcing the material. You will also be completing frequent homework assignments. As a rough guide, I expect that most students will spend 8-10 hours each week outside of class to go over material and to complete homework assignments.

GRADES AND EVALUATION

Grades will be based on participation, completion of homework assignments, two in-class midterm exams, and a take-home final exam. I strongly encourage you to work with other graduate students on homework. At the same time, it is important to keep in mind that every student must master the material. Each week, we will devote some time to reviewing homework assignments in class, and I will feel free to call on anyone to present the solution to a problem. You may NOT collaborate on the exams.

- Homework/Participation: 20%
- Exam 1: 20%
- Exam 2: 25%
- Take-home final: 35%

If you miss a midterm exam, and have not made alternative arrangements prior to the exam with me, you will not be given a make-up exam. Instead, the weight placed on your final exam will be increased accordingly. Final exams are due in hard copy in my office by noon on 4/21. Exams that are not turned in on time will receive a 10 point (out of 100 points) penalty for each hour (or part thereof) they are late.

Course grades will be determined according to the following grading scale: **A:** 93-100 **A-:** 90-92 **B+:** 88-89 **B:** 83-87 **B-:** 80-82 **C+:** 78-79 **C:** 73-77 **C-:** 70-72 **D+:** 68-69 **D:** 63-67 **D-:** 60-62 **F:** 0-59

ACADEMIC DISHONESTY

Students and faculty at Duke are governed by the **Duke Community Standard**, and academic dishonesty will not be tolerated. If I suspect that a student has attempted to represent someone else's work as their own, or to cheat in any other manner on an exam or a written assignment, I will refer the case to the Office of Student Conduct in accordance with university policy. If a violation of the academic integrity policy is found to have occurred, the minimum penalty will be a zero (0) on the assignment/exam in question. If you have any questions about plagiarism and proper citation methods, please consult the **Duke Tutorial on Plagiarism**.

STUDENTS WITH CHALLENGES

Students with challenges who require individualized testing or other accommodations should identify themselves and express their needs during the first week of the semester. Where the challenge is not immediately apparent, verification will be required.

APPROXIMATE SEMESTER SCHEDULE

1. Normal Form Games, Mixed Strategies, and Nash Equilibrium

Week 1 (1/14):

Reading:

- Roger Myerson. 1992. "On the Value of Game Theory in Social Science," *Rationality and Society* 4:62-73. READ ONLY THROUGH THE MIDDLE OF PAGE 67 (up to "The requirement that the players know all the information...")

Week 2 (1/19 & 1/21):

Reading:

- Osborne, Chapters 1, 2, 3 (except sections 3.5 and 3.6), and math appendix

Week 3 (1/26 & 1/28):

Reading:

- Osborne, Chapter 3 and 4 (except sections 4.11 and 4.12)
- Geddes, Barbara. 1991. "A Game Theoretic Model of Reform in Latin American Democracies." *American Political Science Review* 85: 371-392.
- FIRST HOMEWORK HANDED OUT 1/28

2. Extensive Form Games and Subgame Perfect Equilibrium

Week 4 (2/2 & 2/4 - no class on 2/4):

Reading:

- Osborne, Chapter 5

Week 5 (2/9 & 2/11):

Reading:

- Osborne, Chapter 6 (except section 6.4)
- SECOND HOMEWORK HANDED OUT 2/9

Week 6 (2/16 & 2/18):

Reading:

- Tuesday, review session (Victoria)
- Thursday, 2/18 EXAM 1 IN CLASS

Week 7 (2/23 & 2/25):

Reading:

- Osborne, Chapter Osborne, Chapter 7 (except section 7.5)
- RECOMMENDED: McCannon, Bryan. 2010. "The Median Juror and the Trial of Socrates." *European Journal of Political Economy* 26: 533-540.

3. Repeated Games

Week 8 (3/1 & 3/3):

Reading:

- Osborne, Chapter 14

Week 9 (3/8 & 3/10):

Reading:

- Osborne, Chapter 15
- Milgrom, Paul, Douglass North, and Barry Weingast. 1990. "The Role of Institutions in the Revival of Trade: The Law Merchant, Private Judges, and the Champagne Fairs." *Economics and Politics* 2: 1-22.
- 3RD HOMEWORK HANDED OUT 3/10

Week 10 (3/15 & 3/17) - No classes/spring break:

4. Bayesian Games

Week 11 (3/22 & 3/24):

Reading:

- Osborne, Chapter Chapter 9 (except sections 9.6 - 9.8)

Week 12 (3/29 & 3/31)

Reading:

- Osborne, Chapter Chapter 9 (except sections 9.6 - 9.8)
- Roger Myerson. 1992. "On the Value of Game Theory in Social Science," *Rationality and Society* 4:62-73.
- Thursday 3/31 EXAM 2 IN CLASS

Week 13 (4/5 & 4/7):

Reading:

- Osborne, Chapter 10 (except sections 10.6 and 10.8)

Week 14 (4/12 & 4/14):

Reading:

- Osborne, Chapter 10 (except sections 10.6 and 10.8)
- Gilligan, Thomas and Keith Krehbiel. 1990. Organization of Informative Committees by a Rational Legislature. *American Journal of Political Science* 34: 531-564.
- 4th HOMEWORK HANDED OUT 4/14

Week 15 (4/19):

Reading:

- CATCH UP

**Final exam handed out on 4/19.
Due on 4/21 at noon.**