POLITICAL SCIENCE 505: THEORIES OF INDIVIDUAL AND COLLECTIVE CHOICE I

Washington University
Department of Political Science
Spring 2018
2:30-4:30PM Thursday
Seigle L004

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Office Hours: By appointment
Seigle 241

This course provides an introduction to non-cooperative game theory and its application to research in political science. Students will learn how to represent static and dynamic games under complete and incomplete information and how to analyze them using appropriate methods and solution concepts. Applications to political science are emphasized as much as possible but the primary focus will be on gaining a solid foundation in game theory.

The required textbook is *Game Theory: An Introduction* by Steven Tadelis. This is a good middle-of-the-road game theory text which provides enough precision to prepare you to use game theory in some realistic applications but stopping short of the most technical books that may be appropriate for a more advanced course. For students who desire a slightly gentler (i.e. less mathematical) introduction to game theory I suggest Martin Osborne's (2004) *An Introduction to Game Theory.* Students who crave a more advanced reference should consider Osborne and Rubinstein's *A Course in Game Theory*, Roger Myerson's *Game Theory: Analysis of Conflict,* or Fudenberg and Tirole's *Game Theory,* which are all fantastic but very technical. Osborne and Rubinstein's book has the added virtue of being available for free online. I will use some material from Gehlbach's *Formal Theories of Domestic Politics* which I enthusiastically recommend but is not required.

I assume that students have a working knowledge of algebra, elementary calculus, and basic probability theory. Political Science 5052 or a comparable course is sufficient. For students who require a refresher on one or more of these topics, I recommend Simon and Blume's (1994) *Mathematics for Economists* or Moore and Siegel's (2013) *A Mathematics Course for Political and Social Research.*

GRADES AND REQUIREMENTS

The course grade will be determined as follows:

- Problem sets (approximately weekly): 50%
- Exams:
  - Exam 1: 25%
  - Exam 2: 25%

- The problem sets will help students to understand the core theoretical concepts and develop the ability to solve games.
  - I have not found a way to learn game theory that works as well as solving a lot of games, so the problem sets will be frequent and challenging.
  - Students may work together on problem sets but must each turn in separate assignments. Working together means discussing solutions and methods; it does not mean splitting up the problems or copying solutions from another students.
  - I strongly recommend that students typeset all problems in the LaTeX typesetting program: familiarizing yourself with a scientific typesetting system is a a research skill that will make it much easier for you to actually conduct game theoretic or otherwise mathematical research. I will put some helpful LaTeX help files on the course website.
- There will be two in-class exams, the timing of which will depend on how quickly we move through the material. The exams will be similar to the problem sets except that they must be completed in class without collaboration or reference materials.

Course Policies and Expectations

- Attendance Policy. I do not take attendance, though as a practical matter you will probably fail this course if you do not attend. Attendance is required on days that include in-class activities such as an exam.
- Academic Integrity. I take academic integrity very seriously. You may review the University's policies here.
- Late assignments. Late assignments may be accepted with a 10% deduction before graded assignments have been returned to students. After that time, late assignments will not be accepted.
- Accommodations due to disability. If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours.

Course Topics

A list of topics and associated course readings are below. I strongly recommend doing the readings, though students may choose whether to read the chapters before or after lectures.

Topic	Reading
Decision Theory	Tadelis 1-2
Games and Nash Equilibrium in Pure Strategies	Tadelis 3-5
Nash Equilibrium in Mixed Strategies	Tadelis 6
Electoral Competition	Handout
Extensive Form Games	Tadelis 7-8
Repeated and Multi-stage games	Tadelis 9-10
EXAM	
Games of Incomplete Information	Tadelis 12
Sequential Games of Incomplete Information	Tadelis 15
Signaling	Tadelis 16
Delegation	Handout
Cheap Talk	Tadelis 18
EXAM	