Syllabus for Political Science 203a:
Analytical Theory I

Winter 2022
(Last updated on January 5, 2022)

Instructor:	Sean Ingham	**Time**:	Wed., Fri., 9-10:20am
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Course description

This is the first course in a two-course sequence. The sequence has three objectives: (1) to introduce the basic concepts and logic of formal political theory (i.e., decision theory, social choice theory, and noncooperative game theory); (2) to introduce some canonical applications of formal political theory from various fields of political science; (3) to show students how formal models can be useful as aids for clarifying social-scientific concepts and exploring their implications.

Some familiarity with basic set theory and proofs will be essential. The mathematical appendix in Tadelis is a good review of some of the basic mathematical concepts we use in the course, especially 19.1 and 19.2.

Course materials

The primary textbook is Steven Tadelis, *Game Theory: An Introduction* (PUP, 2013). I will also circulate detailed lecture notes. Aside from the Tadelis textbook, which is available at the university bookstore, all course materials can be found on the Canvas website or online through the university library.

Assessment

There will be four problem sets (40% of final grade), a midterm (30%), and a final exam (30%).

- The midterm exam is tentatively scheduled for February 4. It will be conducted in person (closed book, closed notes). It will cover the material labeled "Theory" in sections 1 ("Modeling intentional actors...") and 2 ("Social choices...") of the tentative schedule below.

- The final exam is cumulative and covers all the material labeled "Theory" in the schedule. It will be conducted in person (closed book, closed notes) on March 16, 9am-noon.

- You are permitted and indeed encouraged to work on the problem sets with other students in the class. However, you must write up your own solutions, independently and without others' help, and only submit solutions you fully understand and are capable of reproducing and explaining on your own. Submitting a solution that one does not understand and cannot explain will be treated as a violation of academic integrity.

- Problem sets should be typeset using LaTeX and the .tex and .pdf files should be submitted electronically in Canvas. Solutions to problem sets will usually be made available on Canvas immediately after the submission deadline has passed; a problem set submitted after the deadline will not receive credit if the solutions to the problem set have already been made available.

- To receive credit for a problem set, you must submit a self-graded copy of your problem set no later than one week after the solutions have been posted. Grading rubrics and instructions will be provided as part of the solutions.

Tentative schedule

The following tentative schedule will be updated with more guidance about what to read for each lecture as the quarter progresses.

1. **Why formal theory?** (1-2 lectures)

   - James Johnson (2019) "Formal Models in Political Science: Conceptual, Not Empirical," *Journal of Politics*
   - Rubinstein (2012), *Economic Fables*, pp. 16–40
   - Andersen, "The Emperor's New Clothes"
   - Kuran (1991), "Now Out of Never", *World Politics*, section 3
   - Laudan (1978), *Progress and Its Problems*, ch. 2
   - Schelling, "Thermostats, Lemons, and Other Families of Models"
   - Slantchev (2017), "On the Proper Use of Game Theory in Conflict Studies"
   - Scott Ashworth, Christopher Berry, and Ethan Bueno de Mesquita, *Theory and Credibility*, chapters 1, 2, and 4.

2. **Modeling intentional actors who do things for reasons** (4-5 lectures)

   Theory: preferences and choices, utility theory, uncertainty and risk

   - Tadelis, chs. 1, 2

   Application: voter turnout

   - Anthony Downs. 1957. *An Economic Theory of Democracy*. Ch. 14
   - Riker and Ordeshook. 1968. "A Theory of the Calculus of Voting." *American Political Science Review*

   Application: justice and impartial rationality

   - John Rawls. 1975. *A Theory of Justice*. §§3–5, 11, 15, 16, 20, 24–28
   - John Harsanyi. 1975. "Can the Maximin Principle Serve as a Basis for Morality? A Critique of John Rawls's Theory" *American Political Science Review*, sections 1-8, postscript.

3. **Social choices, social welfare, voting, and other aggregation problems** (4-5 lectures)

   Theory: Arrow's impossibility theorem, the Gibbard-Satterthwaite theorem, median voter theorem, the multidimensional spatial model

   - David Austin-Smith and Jeffrey Banks. 1999. *Positive Political Theory I: Collective Preferences*. Michigan University Press. Ch. 2.
   - Philip Reny. 2001. "Arrow's theorem and the Gibbard-Satterthwaite theorem: a unified approach." *Economic Letters* 70: 99–105.

   Application: Democratic legitimacy and populism

   - Sean Ingham. 2019. "Why Arrow's Theorem Matters for Political Theory Even If Preference Cycles Never Occur." *Public Choice* 179(1): 97–111.

- John W. Patty and Elizabeth Maggie Penn. 2014. *Social Choice and Legitimacy: The Possibilities of Impossibility.* Cambridge University Press. Chs. 2, 3.

4. **Modelling strategic interdependence: static games of complete information** (8-10 lectures)

Theory: normal-form and extended-form games of complete information, dominant strategies and iterative reasoning, Nash equilibrium in pure and mixed strategies.

- Tadelis, chs. 3–7

Application: electoral competition

- Gehlbach, *Formal Models of Domestic Politics*, secs. 1.1–1.3

Application: social dilemmas and collective action

- Olson, *The Logic of Collective Action*, ch. 1; compare with Bueno de Mesquita, Political Economy for Public Policy, pp. 105–08
- Palfrey and Rosenthal (1984), "Participation and the Provision of Discrete Public Goods"; read model in McCarty and Meirowitz, *Political Game Theory*, pp. 140–45
- Hardin (1968), "The Tragedy of the Commons", *Science*; compare with Tadelis, sec. 5.2.2
- Demsetz (1967), "Toward a Theory of Property Rights", *American Economic Review*
- Ostrom, *Governing the Commons*, ch. 1

Application: the state of nature and the social contract

- Thomas Hobbes, *Leviathan*, chs. 13, 14, 15 (to paragraph 8), 17
- Skyrms (2001), "The Stag Hunt", Proceedings and Addresses of the APA, secs. I and II
- Schelling, *The Strategy of Conflict*, ch. 3