Overview. This is a second graduate course on game theory in political science, with an emphasis on its application rather than advanced theory. We explore the use of formal, game theoretic models in the study of politics. The primary purpose of the course is two-fold: (1) the course will provide students with an understanding of the typical toolkit of formal modelers that are particularly useful for models of politics; (2) the course will offer selected coverage of the existing applied formal literature in political science, keeping an eye on how these tools and techniques can and have been applied to substantive problems in the study of political phenomena. Throughout the course, the emphasis will be on how to develop, solve, and analyze interesting models, and prove results.

Formal modeling is representation of complex reality in a stylized form. The process is not just abstraction of a phenomenon, but creative simplification and theorization as well as argumentation. The clarity, or the logical consistency, of your argument is not the sole purpose of simplification (as commonly argued); rather, valuable insights are the reason for modeling (which you may or may not obtain). That is, modeling is art more than science. The scientific (or procedural) aspect of modeling is easy to learn, but the artistic sense (or skills) of modeling is less so. While the former will be the focus of this class, I hope to cultivate the latter by working together with students.

Course structure. The course meets once per week. Since this course is “part theory, part methods” in nature, it will be “part lecture, part seminar” in format. I will begin each class session with a lecture on the topic of the week, and replicate the model and the (main) results step-by-step. We consider the choices that modelers need to make and the set of options that they have and we review approaches to constructing models and proving results.

Prerequisite/Expectations. Since this class is a follow-on to Ahmer Tarar’s Game Theory class in the spring semester, the successful completion of his class, or its equivalent, is the prerequisite for this course.¹ Some background in algebra and elementary probability theory

is expected. There will be only a few readings per week, reflecting the fact that students are expected to engage in close reading of a model that we choose, and to be very much in command of every paper. Students may need to spend four to five times as much time on each paper as one would in a field seminar. Before the class each week, students are expected to write down the formal set-up of the model, list the assumptions and the notations used, and state (formally) the main results.

Textbook. There is no textbook for this class. The following books however are helpful:


Course requirements. The primary goal of the course is to train students in the development and exposition of their own formal models, in addition to the normal “exposure to the published formal models” in the literature. Assignments will come in three forms:

1. Homework assignments possibly in Weeks 4 and 7 (10%)
2. The final exam (70%)
3. Class participation (10%)
4. Submission problem sets using scientific editors such as \LaTeX (10%)

Modeling project. With my permission, you may substitute the final exam with a research paper presenting an original modeling project. Over the course of the semester, you may develop and solve your own model of a strategic interaction in politics. The model should be developed incrementally and made more complex as the course progresses, with the hope that the final product will be an interesting and novel contribution. Ideally, this product should contribute to your dissertation project. The paper should motivate a problem, develop a model and prove propositions, and identify testable predictions resulting from the model (i.e., empirical implications of your theoretical model). The final paper must be a complete paper. That is, it cannot be a “lab” note for yourself with the construction of the solution, proofs, extensions, lots of calculations, and perhaps figures and numerical examples to aid your solutions.

If you wish to choose the research paper (i.e., modeling project) route, there will be several deadlines along the way.

- Week 2: A proposal stating the problems, issues, or puzzles that you intend to address with a formal model. This should include an informal description of the problem being addressed and the puzzle being solved in your project. You should also explain the strategic interaction you wish to describe; the phenomenon for which you wish to explore the causal mechanism (or data generating process; the political outcomes for which you wish to identify the conditions. You should also attach to this proposal a list of
published models that are close your intended model or that you would like to replicate, build on, and/or extend for your final project. The literature review is prohibited.

– At this point, I will determine if you can pursue the modeling project as part of the course requirement for this course.

• Week 5: Model specification. This should include the formal set-up of the (game theoretic) model — i.e., players, actions/strategies, outcomes, and some consideration of probable preference orderings as well as information and beliefs.

• Week 7: Solution (equilibrium analysis).

• Week 9: Interpretation, equilibrium behavior, comparative static hypotheses, welfare analysis, etc.

• Final week: The complete paper is due by the final exam.

**Topics and readings (tentative).** This is a tentative list and some topics may not be covered, depending on the students’ interest. How far we get in this semester will depend on the students’ interests and backgrounds.

**Topic 1 Modeling and Epistemology**


*Supplementary*

**Topic 2 Simultaneous-Move Games: Median Voter Theorem**


*Supplementary*


**Topic 3 Dynamic Games and Backward Induction**


On cardinal vs. ordinal preference


Topic 4 Incomplete information Games with Two Types: Incentive Compatibility

*Seminal work*

*On incentive compatibility*

Topic 5 Incomplete Information Games with Continuous Types: Refinements


*Supplementary*

Topic 6 Bayesian Games & Welfare Analysis

*Supplementary*

Topic 7 Cheap talk

Topic 8 Repeated Games: Repeated Prisoner’s Dilemma w/ Complete Information


Textbook

Topic 9 Repeated Games: Repeated Extensive-Form Game w/ Incomplete Information


‘Honest’ talk on private values in an infinite iteration;

‘Honest’ talk on intentions in an infinite iteration;

Topic 10 Legislative Bargaining


Supplementary
McCarty and Meirowitz. Political Game Theory, ch. 10.

Topic 11 Crisis Bargaining


Topic 12 Veto Bargaining


Supplementary

Topic 13 War of Attrition

*Supplementary*

**Topic 14 Principal-Agent (Electoral Accountability)**


*Supplementary*
Bueno de Mesquita, Ethan.

**Topic 15 Information Aggregation: The Swing Voter’s Curse**
