

PLAYING WITH POWER: GAME THEORY IN ACTION!

UNIVERSITY OF VIRGINIA
TUESDAYS AND THURSDAYS, 11:00 AM – 12:15 PM
215 FAYERWEATHER HALL
FALL 2025

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Office Hours: Tuesdays 12:15 – 1:30 or by appointment

COURSE OVERVIEW

Why do countries go to war? Why do politicians make promises they don't keep? Why do some groups cooperate while others fight? Game theory gives us a toolkit for answering these kinds of questions by studying how people make choices when their outcomes depend on what others do. In this course, we'll use simple models and examples—from everyday life to world politics—to understand strategic behavior in cooperation, conflict, bargaining, elections, and more. You don't need any prior background in math or game theory; we'll build the concepts step by step. By the end of the semester, you'll not only understand the basics of game theory but also be able to view politics through a strategic lens.

COURSE REQUIREMENTS

1. In-Class Engagement (5%)

- Attending lecture, asking questions, and being engaged during class is the most important part of learning game theory! There are no required readings or textbooks for this course. Instead, the best way to learn the material is by being present and engaged in class.
- Please no phones or laptops during class. I have found that working through the problems using pencil and paper is the best way to learn game theory.
- However, *if you are sick, please do not come to class*. Take care of yourself and get some rest. You do not need to let me know if you need to miss a lecture, and I'm happy to help you catch up afterwards if you need. Thanks for being considerate of your classmates.

2. Assignments (25%)

- There are 5 assignments throughout the semester, worth 5% each.
- Each assignment will include a few practice problems to build experience with the models we are studying, along with one question that applies game theory concepts to real political situations.
- Assignments will be graded on the basis of completion and effort (✓ / ✓+ / ✓-).

3. Midterm Checkpoint (15%)

- There will be a short in-class midterm on **October 9**. You're welcome to bring your notes and refer to them during the midterm.
- The questions will be similar to the practice problems from the assignments and will focus on making sure we understand key concepts.

4. Final Checkpoint (15%)

- There will be a short in-class final on **December 9**.
- The final will emphasize material from the second half of the class, and the format will be similar to the midterm, including being open-note.

5. Final Project (30%)

- We will also have final project, which will be a 5-page, doubled spaced paper. You still select a political science case (historical or contemporary) and analyze it using game theory concepts from class.
- The final project will be due by 11:59 PM on **December 16**.

**If you have any conflicts with the midterm or final dates, please let me know in advance*.*

SOME GUIDANCE

Math can feel hard for everyone sometimes. **Do not be afraid or embarrassed to ask for help – either from me or from your classmates.** Take advantage of office hours and please feel free to ask questions at any time in class. If anyone does not understand something, I am more than happy to stop and clarify the point before we move on. It is not a good idea to “skip” things in math – if you don't understand something now, don't wait. Clarify immediately. A lot of things build on top of each other, and a small question now will likely turn into much more confusion later. **Try to stay on top of problem sets as best as you can.**

Collaboration can be a great idea in game theory classes – you can learn as much from your classmates as you do from me! You are welcome to work with others in the class on the assignments. **However, you will not learn anything if you simply copy from someone else.** I recommend trying all the exercises on your own first, and then use the groups to troubleshoot or talk through questions.

TEXTBOOKS

There isn't a single game theory textbook that will work perfectly for everyone, and in my experience, students usually end up relying more on lecture notes and online resources. However, I did want to provide two free options that you can check out from the UVA library. You do *not* need to refer to these textbooks if you don't want to.

- *Game Theory for Political Scientists* by James D. Marrow
- *An Introduction to Game Theory* by Martin Osborne

LATE POLICY

To ensure fairness for all students, I generally don't alter deadlines. Please plan ahead and complete all assignments on time. However, if an emergency does come up, please get in touch with me.

REGRADE POLICY

If a grade dispute arises, please provide a one-page memo explaining why you believe the grade you received is incorrect. A copy of the graded assignment should be included along with the memo. Re-grade requests must be submitted within a week from the time the grade was first received. Note that re-grade requests may result in a higher or lower grade, so utilize this option carefully.

SCHEDULE

Below is a schedule for the semester. **I have highlighted all important dates, including the due dates for the assignments, dates of the in-class midterm and final checkpoints, and dates where we will not have class.** We may adjust the coverage of topics as we go along, but all other dates are set.

(Week 1) Aug 26-28: Introduction to game theory and rational choice

(Week 2) Sept 2-4: Normal Form Games and Dominance

(Week 3) **Sept 9-11: No class! Instructor at conference**

(Week 4) Sept 16-18: Normal Form Games and Nash Equilibria
Assignment 1 due in class on Sept 18

(Week 5) Sept 23-25: Normal Form Games and Nash Equilibria

(Week 6) Sept 30-Oct 2: Mixed Strategies

(Week 7) Oct 7: In class review session
Assignment 2 due in class on Oct 7

Oct 9: In class Midterm Checkpoint

(Week 8) **Oct 14: No class. Fall break!**
Oct 16: Introduction to Extensive Form Games

(Week 9) Oct 21-23: Subgame Perfect Nash Equilibrium

(Week 10) Oct 28-30: Thinking about credibility
Assignment 3 due in class on Oct 28

(Week 11) **Nov 4: No class. Election day!**
Nov 6: Thinking about credibility

(Week 12) Nov 11-13: Applications: Bargaining models
Assignment 4 due in class on Nov 11

(Week 13) **Nov 18: No class. Instructor at conference.**
Nov 20: Applications: Repeated games

(Week 14) Nov 25: Applications: Repeated games
Nov 27: No class. Thanksgiving break!

(Week 15) Dec 2-4: Review session and discussion of final projects in class
Assignment 5 due in class on Dec 2

Dec 9: In class Final Checkpoint

Final Project due by 11:59 PM on Tuesday, December 16