Game Theory

Welcome to Game Theory, the conceptual framework for understanding strategic interaction. Using rigorous models of strategy, you will begin thinking about politics analytically, objectively, and deeply. You will transition from simply observing politics to developing rigorous explanations for why individuals behave certain ways. While no prior knowledge is required, we will move at a fast pace, assuming you have a strong aptitude for abstract reasoning and the high school algebra needed to master these powerful tools.

We begin by tackling discrete games – the foundation of strategic behavior with discrete choices. We illustrate the theory using several examples, then apply it to Marbury v Madison, the Cuban Missile Crisis, voter turnout, and the political machines. We will then examine repeated games and their effects on cooperation and biological evolution. The second half of the course will introduc you to spatial voting models and how they help us understand things like behavior of the Supreme Court and passage of the Powell amendment. We will further study mind-bending anomalies of multiple dimensional spatial voting models, such as McKelvey's Chaos Theorem, and apply those models to the Russian Duma, stopping rules in committees, and the alleged vote trade in the election of 1824. In the end, you will understand some of the most advance theories of strategy as it applies to political science, helping you think objectively and "scientifically."

Polling

Occasionally we will use Google Forms for in-class polling. I won't know who answered a question nor record individual responses. Google Forms shows us group opinion in real time. If the QR-codes don't work, use this https://forms.gle/M2sePUH1oecuCyTR7.

AI Software

The use of artificial intelligence (AI) tools like ChatGPT, Copilot, or similar generative AI systems is strictly prohibited in this course for any part of an assignment, including brainstorming, writing, or editing. This policy facilitates your learning of game theory, which at times requires struggling.

Grading

Your grade will consist of your perusall grade, four homework assignments, a mid-term exam, and a final exam. I expect students to attend all classes and assume that you are mature enough to understand what happens when you miss a class. Ask another student for notes if you miss a class. I will not give out notes nor put them on the webinator. However, all assignments will be on ELC.

Although I generally think of 90-100 as an A, 80-90 as a B, etc., but since the university uses a plus minus system I use the following scale for overall grades:

		A	92 or above	A−	90-91.99
B+	88-89.99	B	82-87.99	B−	80-81.99
C+	78-79.99	C	72-77.99	C−	70-71.99
D+	68-69.99	D	62-67.99	D−	60-61.99
F	59.99 or below				

Perusall and Readings. All required reading assignments are posted on Perusall – a social e-reader which encourages you to discuss the readings with other students. Each reading in Perusall is considered an assignment that you read, question, and comment on, worth 10% of your overall grade. Students often ask, "how does Perusall grade me?" The simple answer is it grades reading and discussion. Focus on "discussion," not posting, and pay attention to its nudges to get full points. Note, each assignment (a.k.a., each reading) should be completed before the relevant class. To find the Perusall reading, click on the Perusall link within ELC. It will cost you less than getting a hard copy from the bookstore, so consider it a savings.

Home Work Assignments. Each home work assignment is worth 10% of your grade. These assignment will help you practice the analytic skills taught in the course and help you prepare for the exams. Assignments will be posted on ELC no later than one week before they are due.

Exams. The preponderance of your grade comes from a mid-term exam and a final exam. Both may contain multiple choice, fill in the blank, problem solving, and essay type questions worth 25% of your grade each. The idea is to give you multiple types of questions to evaluate your understanding of the material, not your aptitude for a particular type of test question. I will post a review sheet for each exam on ELC. The final is *not* cumulative. Note: up to a fifth of each exam may come from the readings not covered in lecture, so keep up with Perusall.

Extra Credit. I will assign games in-class for additional points. These games are designed to help students think about the differences between human behavior and game theoretic behavior. There are no make-ups for these demonstrations, so please attend regularly.

<div align="center">Make-ups</div>

Homework assignments require a fair amount of analysis time. Please plan ahead to avoid turning them in late. **Late assignments will be lowered one letter grade for every day they are late and will not be accepted after the next class begins**. This allows folks to get their homeworks back in a timely fashion. If an assignment is late, upload it on ELC then email me so I know it is posted. Grades are lowered for every *day* they are late, not every class day they are late.

If you miss the midterm for a good reason, such as coming down with COVID, and your excuse is ***pre-approved*** by me, you will be allowed to complete a make-up exam. The make-up for the midterm will be at 4:30 pm on Wednesday, March 18, meeting in Baldwin 408. There is no

make-up exam for the final. Make-up exams are more difficult than regular exams and should be avoided.

	Date	Percent of Grade
PERUSALL (reading and discussions)	daily	10%
HOMEWORK 1 (two person games)	Feb 11	10%
HOMEWORK 2 (step-good games)	Feb 25	10%
MIDTERM EXAM	Mar 4	25%
HOMEWORK 3 (repeated games)	Mar 25	10%
HOMEWORK 4 (spatial voting)	Apr 22	10%
FINAL EXAM	May 4	25%

Practice and Readings

The best way to learn game theory is to solve problems on your own. The Dixit, Skeath, and McAdams text (on Perusall) is full of questions you can work through. The "solved" questions have answers available to students. I recommend you work through a number of them each week, particularly the weeks that we don't have a homework due. It will help. Most of the other readings are shorter but analytical, which may require more than one read to be fully comprehended. Remember, if you work hard and complete all the readings, this should be a very rewarding course.

A hard copy of Dixit, Skeath, and McAdams is available at the bookstore (optional):
> Dixit, Avinash, Susan Skeath, and David McAdams (2021) *Games of Strategy*, 5th edition. W. W. Norton & Company – earlier editions acceptable though chapter numbers may vary.

Schedule of Topics and Readings

I. DISCRETE GAMES

Jan 12   **Introduction & Foundations**

                       Two-Person, Sequential Games
Jan 14   *Dixit, Skeath, McAdams, Ch 2, "How to Think about Strategic Games."

Jan 19   No Class: MLK day!

Jan 21-26   *Dixit, Skeath, McAdams, Ch 3, "Games with Sequential Moves."

                       Application: Marbury v. Madison
Jan 28   *Clinton, "Game Theory, Legal History, and the Origins of Judicial Review"
                           American Journal of Political Science.

Feb 2-9	**Two-Person, Simultaneous Games** *Dixit, Skeath, McAdams, Ch 4, "Simultaneous-Move Games: Discrete Strategies."
Feb 11	**Application: Government Reform** *Geddes, Barbara. 1991. "A game theoretic model of reform in Latin American democracies." *American Political Science Review*.
Feb 16	**Incomplete Information Games** *Dixit, Skeath, McAdams, Ch 13, "Brinkmanship: the Cuban Missile Crisis."
Feb 18	*Dixit, Skeath, McAdams, Ch 9, "Uncertainty and Information."
Feb 23	**Step-Good Games and Voter Turnout** *Cain and Dougherty, "Suppressing Shays' Rebellion." *Journal of Theoretical Politics*.
Feb 25	**Application: The Political Machines** *Reichley, Ch 7 & 10, *The Life of the Parties***.** *Jac Heckelman, "The Effect of the Secret Ballot on Voter Turnout Rates," *Public Choice*.
Mar 2	*Catch-Up and Review.
Mar 4	**MIDTERM EXAM**
Mar 9-13	*No class. Spring Break*.
Mar 11	**Repeated Games** *Dixit, Skeath, McAdams, Ch 10, "The Prisoners' Dilemma and Repeated Games."
Mar 16	Discount Factors (video) – watch through Perusall.
Mar 18	Geometric Series and Infinite Payoffs (video) – watch through Perusall.
Mar 23-25	*Joel Watson, 1997, Ch 22, "Repeated Games and Reputation," *Strategy: An Introduction to Game Theory*.

II. SPATIAL VOTING MODELS

The Median Voter Theorem

Mar 30 -   *Hinich and Munger, Ch 2, "The Spatial Model of Downs and Black," *Analytical*
  Apr 1   *Politics*.

*Dixit, Skeath, McAdams, Ch 16, "Strategy and Voting," pp. 652-657 only.

Application: The Median Justice

Apr 6   *Bonneau et al. 2007. "Agenda Control, the Median Justice, and the Majority
Opinion on the U.S. Supreme Court," *AJPS*, 51(4): 890-905.

Multidimensional Spatial Voting Models

Apr 8-15   *Hinich and Munger, Ch 3, "Two Dimensions: Elusive Equilibrium," *Analytical
Politics*.

*Stewart, *Analyzing Congress*, Chapter 1 (pp. 33-35).

Apr 20   **The Core**

*Ordeshook. 1986. *Game Theory and Political Theory*, sections 8.1 & 8.2 – focus
on calculating the core in a spatial voting game. Skip alpha and beta core.

Application: Voting in Committees

Apr 22   *Dougherty et al., 2018. "Stopping Rules for Majority Voting: A Public Choice
Experiment," *Journal of Economic Behavior and Organization*.

Apr 27   *Catch-Up & Review

May 4   **FINAL EXAM (12:00-2:00 pm)**

CLASSROOM AND UNIVERSITY POLICIES

Disclaimer
This syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Student Honesty
All academic work must meet the standards contained in "A Culture of Honesty." Students are responsible for informing themselves about these standards before performing academic work. The penalties for academic dishonesty are severe and ignorance is not an acceptable defense. Also note that the course syllabus is a general plan for the course and that deviations announced to the class by the instructor may be necessary.

Mental Health and Wellness Resources
If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit https://sco.uga.edu. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.

UGA has several resources for students seeking mental health services or crisis support. If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center. Additional resources can be accessed through the UGA App.