GAME THEORY FOR POLITICAL SCIENCE

Political Science 4350, May Term 2022
M–F 10:00am–12:00pm & 2:00–4:00pm, Room: Dallas Hall 102
Web page: http://canvas.smu.edu

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Office Hours:
M–Th 4:00–5:00pm
or by appointment

Course Description

Politics is about conflict—what happens when people disagree about how society should be organized, what government policies should be, where borders belong, who gets to be a leader. When there is conflict, there will be strategy. People on one side of an issue will do what they can to bring about the outcome that they want most. In doing so, they will strategically anticipate the actions of their opponents, who themselves are trying to anticipate the actions of the first group. In a strategic situation, I am trying to outwit you, knowing that you're trying to outwit me, knowing that I'm trying to outwit you…etc. Things get complicated.

In this class, we will learn a framework for understanding these complicated strategic interactions. The framework is the game theory, which was developed by applied mathematicians in the mid-20th century. The movie, *A Beautiful Mind*, which won the Oscar for the best picture in 2002, tells us the story of John Nash, one of the game theory's founders. "He saw the world in a way no one had ever imagined," according to the posters. This is an exaggeration, but it is true that the game theory induces a different way of looking at problems.

This course is an introduction to game theory as used in political science. Upon successful completion of this course, students will be able to:

- enhance logical thinking,
- perform technical game theoretic analyses of well-defined situations,
- translate some important political conflict into a well-defined game, as a professional political scientist would,
- apply game-theoretic ideas informally to conflict situations, in a way that is relevant to life more broadly, and
- seek solution in different ways on various problems in politics, economy, and society.

The instructor is a political scientist, and this is a political science class. We will not be concerned here with the mathematical theorems that are at the foundation of game theory. (There are courses in the mathematics and economics departments along these lines, for those who are interested.) Rather, our focus will be on using game theory to understand politics and political strategy.

Course Requirements

Grades will be based on an in-class midterm examination (30%), an in-class final examination (40%), seven homework assignments (20%), and attendance and participation (10%). The final examination is cumulative.

Textbooks

The following book is available for purchase at the bookstore:

Avinash K. Dixit, Susan Skeath, and David McAdams (DSM), *Games of Strategy*, fifth edition (New York: W.W. Norton & Company, 2021).

Attendance and Participation: Attendance at lecture and participation in class activities are mandatory. You are expected to attend all the lectures and complete all the homework assignments. An unexcused absence will adversely affect your course grade, as will being present but unprepared, or participating without being prepared.

After two unexcused absences, I may drop you from the course or give an FA (F for attendance) to your course grade. An excused absence is almost exclusively restricted to religious reasons, certain university activities, documented medical conditions, or documented family emergencies. Absences for religious reasons or for university extracurricular activities require communication with me at the **beginning** of the semester. It is **your** responsibility to make arrangements with me **prior** to any missed scheduled examination or other missed assignment for making up the work.

Ultimately your attendance and participation grade turns on **my** impression of how seriously you take this course. It is **your** responsibility to take this course seriously and let me know that. How? Attend class; be prepared for class—complete the assignments, be ready to ask and answer questions, and take an informed role in class activities; **arrive early** to class; remain for the entire class; *be attentive in class without distracting me or your classmates with cell phones, text messages, side conversations, bathroom trips, coming-and-going, and so forth*; complete assignments when due; and demonstrate your understanding on the homework assignments and exams. Laptops, cell phones, iPhones, and any other *electronic devices may not be used in class*—**not even for note-taking**.

Homework Assignments: There will be seven homework assignments, handed out at the end of most of the lectures and due at the beginning of the following lecture (see the schedule for exact dates). The homework exercises will give you practice using basic concepts of the game theory and applying them to political problems. These problems are similar to those that will be on the midterm and the final.

Study Groups: Many students find it very helpful to form study groups to discuss examples from lectures and books, and to work on problem sets. It is fine to discuss problem sets with other students, but you must write up your answers alone. If you simply copy the homework assignment of another student, you risk getting a zero score for yourself and the person whom

you copied from, and you will miss the overall point of the homework, which is to prepare for the exams that are a large part of your grade.

Schedule

1. Introduction and General Principles (May 16)
DSM, chapters 1–2 (pp. 3–44)

2. Games with Sequential Moves (May 17)
DSM, chapter 3 (pp. 47–84)
Homework #1 Due

3. Simultaneous Move Games: Discrete Strategies (May 18)
DSM, chapter 4 (pp. 85–129)
Homework #2 Due

4. Simultaneous Move Games: Mixed Strategy (May 19)
DSM, chapter 7 (pp. 212–263)
Homework #3 Due

5. Review (May 20)
Homework #4 Due

6. IN-CLASS MIDTERM (May 23)
Movie: "A Beautiful Mind"

7. Uncertainty and Information (May 24)
DSM, chapter 9 (pp. 308–374)

8. The Prisoners' Dilemma and Repeated Games (May 25)
DSM, chapter 10 (pp. 375–419)

9. Strategy and Voting (May 26)
DSR, chapter 16 (pp. 627–671)
Homework #5 Due

10. Review (May 27)
Homework #6 Due

11. IN-CLASS FINAL (May 31)