PSC 393: Game Theory and Politics

Department of Political Science
University at Buffalo
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Description:

This course provides an introduction to game-theoretic models in political science, with a special, though not exclusive, emphasis on applications in international politics. It examines political, military, and economic choices under conditions of certainty, risk, and uncertainty. Topics include game-theoretic treatments of battles and warfare, arms races, crises, deterrence, superpower conflict, international negotiations, power, and alliance and coalition politics.

Required Texts:

Avinish Dixit and Barry Nalebuff, *The Art of Strategy*. New York: Norton, 2008.

William Poundstone, *Prisoner's Dilemma*. New York: Anchor Books, 1992.

Philip Straffin, *Game Theory and Strategy*. Washington, DC: Mathematical Society of America, 1995.

Frank C. Zagare (1984), *Game Theory: Concepts and Applications.* Beverly Hills, CA: Sage, 1984.

Frank C. Zagare (2019), *Game Theory, Diplomatic History and Security Studies.* Oxford: Oxford University Press, 2019.

Strongly Suggested:

Itzhak Gilboa, *Rational Choice*. Cambridge: MIT Press, 2010.

Requirements:

There will be two examinations based on the assigned readings *and* the material covered in class. The examinations will count for 100% of the final grade. *There are no make-ups*! Missed examinations will be graded for no credit and averaged.

All exams will be on-line. The examinations will require students to compose answers in MS Word (or pdf) format and submit these answers to UB Learns. Some responses will require a graphical answer which may be composed either by using Word's drawing tools or by drawing figures by hand and submitting them electronically. Students who are unable to answer these questions will not be able to complete the course successfully.

Students are expected to review all the lectures and complete all the homework assignments. Participation in the Zoom meetings is strongly encouraged but not required.

Learning Outcome	Assessment Measures:
Be able to identify, discuss, and apply key concepts and major approaches in game theory	Participation in class discussion In-class exams
Demonstrate the ability to think theoretically about politics	Participation in class discussion In-class exams

Academic misconduct: Academic misconduct will not be tolerated in this course. A student with a documented case of plagiarism, cheating, or another form of academic dishonesty will receive the grade of "F" for the course and might face other disciplinary action under University regulations.

Students with disabilities policy: The Americans with Disabilities Act (ADA) is a federal stature that provides comprehensive civil rights protection for persons with disabilities. This legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring accommodation, please notify the instructor immediately.

Intellectual Property: Course materials that I (Frank C. Zagare) have prepared, together with the content of all lectures and materials presented and prepared by me in this course are my intellectual property. Video, audio, and photographic recording of lectures is prohibited without my explicit permission. The selling or dissemination of exams, study guides, homework assignments and handouts is prohibited without my explicit permission. The selling or dissemination for commercial purposes of notes derived from my lectures is also prohibited without my explicit permission.

It is in the world of things and places, times and troubles and turbid processes, that mathematics is not so much applied as *illustrated*.
David Berlinski, *A Tour of the Calculus*

The following is a chronological list of topics and suggested readings. The amount of time spent on each topic depends on the ability of the class to absorb and understand the material.

I. Introduction

Dixit and Nalebuff, Chapter 1
Poundstone, Chapters 1 – 2
Zagare (1984), "Introduction"
Zagare (2019), pp 7 – 8.
Straffin, Chapters 10 and 33
Gilboa, Chapter 1; Chapter 6 (suggested)
Handout: "The Game Theorist" (*New York Times*, February 11, 1977)*

II. Representing Games I: The Extensive Form

Dixit and Nalebuff, Chapter 2
Poundstone, Chapter 3
Zagare (1984), pp. 11 – 15
Straffin, Chapter 7
Handout: The Battle of the Bismarck Sea*

III. Representing Games II: The Normal Form

Poundstone, Chapter 4
Zagare (1984), pp. 16 – 21
Homework 1*
"Extensive Form of Asymmetric Escalation Game"*

IV. Two-Person Zero-Sum Games

Dixit and Nalebuff, Chapters 3 and 7
Poundstone, Chapter 5
Zagare (1984), Chapter 2
Straffin, Chapters 1 – 6, and 8
Homework 2 and 3*
Exercise 4.3*

V. Introduction to Utility Theory

Straffin, Chapter 9
Gilboa, Chapters 2 – 4; Chapter 5 (suggested)

VI. Two-Person Nonzero-Sum Non-cooperative Games

Dixit and Nalebuff, Chapters 4 – 6 and 8 – 13
Poundstone, Chapters 6 – 11
Straffin, Chapters 11 – 15
Zagare (1984), Chapter 3
Zagare (2019), pp: 9 – 19, Chapters 2 and 8.
Gilboa, Chapter 7; Chapter 8 (suggested)
Handout: "Game Theory Wins a Nobel" (*New York Times*, October 12, 1994)*
*Exercise 5.2

VII. The Theory Of Metagames

Straffin, pp. 76 – 78
Poundstone, pp. 226 – 28
Zagare (2019), pp. 61 – 71.

VIII. Analysis Of Options

Michael C. Shupe et al., (1980). "Nationalization of the Suez Canal," *Journal of Conflict Resolution*, 24: 477 – 93.#
Zagare (2019), pp. 71 – 75.

IX. The Theory of Moves

Steven J. Brams, "Theory of Moves" *American Scientist*, 81 (November–December 1993), pp. 562 – 70.*
Itzhak Gilboa (1995). "Review of *Theory of Moves,*" *Games and Economic Behavior*, 10: 368 –72.*
Zagare (2019), pp. 75 – 78.

X. Incomplete Information Games

Zagare (2019), pp. 19 – 24, 78 – 81, Chapters 3 – 7.

XI. Introduction to N-Person Games

Zagare (1984), pp. 71 – 82
Straffin, Chapters 19, 21 – 25, and 29

XII. Coalition Theory

Zagare (1984), pp. 82 – 85
Straffin, Chapter 30
S. M. Amadae and Bruce Bueno de Mesquita "The Rochester School: The Origins of Positive Political Theory." *American Review of Political Science*, 2: 269—95.*

= available at: http://www.jstor.org/
* = available at: http://www.acsu.buffalo.edu/~fczagare/GameTheoryHome.htm