

# 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 of these models to 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.

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

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, *Game Theory: Concepts and Applications*. Beverly Hills, CA: Sage, 1984.

Zagare, Frank C. and D. Marc Kilgour, *Perfect Deterrence*. New York: Cambridge University Press, 2000.

## Requirements:

There will be two or three examinations based on the assigned readings *and* the material covered in class. The examinations will count for 80% - 90% of the final grade. *There are no make-ups!* Missed examinations will be graded for no credit and averaged. All exams will be in-class.

Students are expected to attend class, to be on time, and to keep up with the reading assignments. Students should be prepared to discuss the reading assignments in class. Classroom participation, including attendance and homework assignments, will count for up to 20% of the final grade. Questions about the classroom material are encouraged. Homework assignments should be typed or neatly written. Please turn off all electronic devices, except for computers, during class.

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 statute 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.

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, “Introduction”  
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, pp. 11 – 15  
Straffin, Chapter 7  
Handout: The Battle of the Bismarck Sea\*

## **III. Representing Games II: The Normal Form**

Poundstone, Chapter 4  
Zagare, 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, 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, Chapter 3

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 and Kilgour, Section 2.5

## **VIII. Analysis Of Options**

Michael C. Shupe et al., (1980). “Nationalization of the Suez Canal,” *Journal of Conflict Resolution*, 24: 477 – 93.#

## **IX. Evolutionary Stable Strategies**

Poundstone, pp. Chapter 12 – 13

Straffin, pp. 78 – 79

\*“The Importance of Being Nice”

## **X. 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.\*

Frank C. Zagare, “A Game-Theoretic Evaluation of the Cease-Fire Alert Decision of 1973,” *Journal of Peace Research*, 20, number 1 (April 1983), pp. 73 – 86.\*

## **XI. Incomplete Information Games**

Zagare and Kilgour, Chapters 1 – 5, and 10.

## **XII. Voting Games**

Straffin Chapter 20

Zagare, p. 64 – 71

Frank C. Zagare, “A Game-Theoretic Analysis of the Vietnam Negotiations: Preferences and Strategies, 1968-1973,” *Journal of Conflict Resolution*, 21 (December 1977), pp. 663 – 84. #

\*Homework 4

## **XIII. Two-Person Nonzero-Sum Cooperative Games**

Straffin, Chapters 16 – 17

## **XIV. Introduction to N-Person Games**

Zagare, pp. 71 – 82

Straffin, Chapters 19, 21 – 25, and 29

\*“Harvard is Lone Bidder”

## **XV. Coalition Theory**

Zagare, pp. 82 – 85

Straffin, Chapter 30

\*“The Rochester School”

## **XVI. Power Indices**

Zagare, pp. 85 – 90

Straffin, Chapters 26 – 28



# = available at: <http://www.jstor.org/>

\* = available at: <http://www.acsu.buffalo.edu/~fczagare/GameTheoryHome.htm>