

Political Science H596 Honors Seminar. Winter 2010. OSU

MW 11:30-1:18 Baker Systems 0188

Game Theory Applications in Political Science: Game Theory of War and Democracy

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This course will focus on the key questions of comparative and international politics: why do states go to war, how can they deter nuclear war, how to curb nuclear proliferation, why do dictatorships exist, how democracies emerge, what makes democracy stable, what is the political rationale for terrorism, and so forth? In addition, you will be introduced to the fundamental concepts of game theory such as the Nash equilibrium, subgame-perfection, and Bayesian learning.

Game theory has revolutionized the study of politics, philosophy, economics, as well as evolutionary biology. It is also used by major investment houses, global consulting firms, and militaries worldwide to improve the effectiveness of their strategic decisions. This course will expose you to a vibrant intellectual tradition that spans many disciplines and will also give you a set of analytical tools of great practical relevance.

Game theory requires basic (7th grade) algebra. No prior knowledge of calculus or probability theory is required. I will explain all notations as we go along. You will read excerpts from various textbooks and classical texts (Thucydides' *History of the Peloponnesian War*, Thomas Hobbes' *Leviathan*, Thomas Schelling's *Arms and Influence*, and Carl Von Clausewitz's *On War*). The class has a site on Carmen. Class notes plus some reading material will be posted there.

You are required to solve three problem sets and take a final exam. Although each of you has to turn in your own answers to each problem set, I encourage you to work on the problem sets in groups of two or three maximum. (You can learn a lot by brainstorming an issue with a peer.) The final, in contrast, will take place in class and will be exclusively your own work. Each problem set will count for 1/6 of the grade, class participation will count for 1/10 and the final will represent 4/10.

The class format is two sessions per week of 1 hour and 48 minutes. Attendance to all sessions is mandatory and a requirement to pass the class.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/resource_csc.asp).

Disability Services

¹ The 2004 version of this class was initially designed and taught in collaboration with Jakub Zielinski.

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

Monday Jan 4. Introduction

Harrington ch. 1

Wednesday Jan 6. [1] The State of Nature (pure strategy Nash equilibrium)

Hobbes, posted material.
Harrington read ch. 2, 4

Monday Jan 11. [2] Nuclear Deterrence (mixed strategy Nash)

Schelling, posted material.
Harrington ch. 7

Wednesday Jan 13. [3] Social Contract (repeated PD)

Harrington ch.13
Distribution of the 1st problem set.

Monday Jan 18. Martin Luther King Day (NO CLASS)

Wednesday Jan 20. Correction of the 1st Problem Set

1st problem set due that day at beginning of seminar.

Monday Jan 25. [4] Democratic Stability (repeated game)

Harrington ch. 14

Wednesday Jan 27. [5] War as Commitment Problem (subgame perfection)

Thucydides, posted material
Harrington ch. 8

Monday Feb 1st. [6] Terrorism (subgame perfection)

Harrington ch. 9

Wednesday Feb 3rd. Repetition

Exercises TBA
Distribution of the 2nd problem set.

Monday Feb 8. Correction of the 2nd Problem Set

2nd problem set due that day at beginning of seminar.

Wednesday Feb 10. [7] Nuclear Non-Proliferation: The NPT (Bayesian)

Monday Feb 15. [8] Elections as Control Mechanism (Bayesian)

Harrington ch. 10.

Wednesday Feb 17. [9] Nuclear Non-Proliferation: Bush v. Saddam (Bayesian)

Monday Feb 22. [10] War as a Result of Incomplete Information (Perfect Bayesian Nash)

Harrington ch. 11

Wednesday Feb 24. Repetition

Exercises TBA

Distribution of the 3rd problem set.

Monday March 1st. *Correction of the 3rd Problem Set*

3rd problem set due that day at beginning of seminar.

Wednesday March 3rd. [11] Elections as Selection Mechanism (Perfect Bayesian Nash)

Harrington ch. 12

Monday March 8. [12] Massive Retaliation and Flexible Response (Perfect Bayesian Nash)

Clausewitz, posted material.

Wednesday March 10. Repetition

Exercises TBA