

Political Science 4893H. autumn 2013. OSU

WF 5:30-6:50 Derby 0048

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

Daniel Verdier

verdier.2@osu.edu

Office phone: 292-8130

Office hours: Thursdays at 3-5 or at any pre-arranged time in 2068 Derby Hall

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.

The course 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 classical texts (Thucydides' *History of the Peloponnesian War*, Thomas Hobbes' *Leviathan*, Thomas Schelling's *Arms and Influence*, and Carl Von Clausewitz's *On War*). These readings will be posted on Carmen.

You will also work on a textbook by Joseph E. **Harrington**, Jr. 2009 (there is only one edition), entitled *Games, Strategies, and Decision Making* (New York: Worth Publishers). The first three weeks of assigned readings will be posted on Carmen to give you enough time to acquire the book.

The seminar is made up of two modules: 14 lectures, using PowerPoint™, and 13 exercise/correction/review sessions, using the blackboard. Lecture notes will be posted on Carmen after every lecture.

Were you to have questions that cannot be asked during class or would you need individualized help, I am available at my office in Derby 2068 during office hours or at any pre-arranged time.

Grading:

You are expected to:

- 1) **attend** every class (each unmotivated absence costs 1% of the grade up to 10 absences; beyond 10, you will *not be allowed to take the final exam*) and **participate**; participation will include solving exercises on the blackboard (the grade will not directly sanction the degree or quality of participation).
- 2) answer 6 Carmen-administered **quizzes** from home; each quiz will typically bear on the readings assigned for the upcoming lecture and must be completed before the lecture (the 6 quizzes together are worth 30% of the grade).
- 3) solve 5 **problem sets** at home (together worth 30%).

- 4) take an in-class, closed-book **final** exam (worth 30%).

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

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/>.

8/21. Introductory lecture

8/23. *lecture 1. The State of Nature* (pure strategy Nash equilibrium)

Hobbes, posted material
Harrington CH 4
QUIZZ 1 on CH 4 due before class.

8/28. *exercises from CH 4 and 5*

Harrington CH 5.

8/30. *no class (American Political Science Association annual meeting)*

9/04. *lecture 2. Nuclear Deterrence* (mixed strategy Nash)

Schelling, posted material
Harrington CH 7.

9/06. *lecture 3. Civil War* (mixed strategy Nash)

QUIZZ 2 on CH 7 due before class.

9/11. *exercises from CH 7*

Distribution of the 1st problem set.

9/13. *correction of 1st problem set*

1st PROBLEM set due at beginning of class.

9/18. *lecture 4. The Social Contract* (repeated PD)

Harrington CH 13.

9/20. *lecture 5. Democratic Stability* (repeated game)

Harrington CH 14
QUIZZ 3 on CH 13 and 14 due before class.

9/25. *exercises from CH 13 and 14*

Distribution of the 2nd problem set.

9/28. *correction of 2nd problem set*

2nd PROBLEM set due at beginning of class.

10/02. *lecture 6. War as Commitment Problem* (subgame perfection)

Thucydides, posted material

Harrington CH 8.

10/04. *lecture 7. Terrorism* (subgame perfection)

Harrington CH 9

QUIZZ 4 on CH 8 and 9 due before class.

10/09. *exercises from CH 8 and 9*

Distribution of the 3rd problem set.

10/11. *correction of 3rd problem set*

3rd PROBLEM set due at beginning of class.

10/16. *lecture 8. Nuclear Non-Proliferation: The NPT* (Bayesian)

Harrington CH 10.

10/18. *lecture 9. Elections as Control Mechanism* (Bayesian)

QUIZZ 5 on CH 10 due before class.

10/23. *lecture 10. Nuclear Non-Proliferation: Bush v. Saddam* (Bayesian)

10/25. *exercises from CH 10*

Distribution of 4th problem set.

10/30. *correction of 4th problem set*

4th PROBLEM set due at beginning of class.

11/01. *lecture 11. War as a Result of Incomplete Information* (Perfect Bayesian Nash)

Harrington CH 11

QUIZZ 6 on CH 11 due before class.

11/06. *exercises from CH 11*

11/08. *lecture 12. Elections as Selection Mechanism* (Perfect Bayesian Nash)

11/13. *lecture 13. Massive Retaliation and Flexible Response* (Perfect Bayesian Nash)

Clausewitz, posted material.

11/15. *exercises*

Distribution of 5th problem set.

11/20. *correction of 5th problem set*
5th PROBLEM set due at beginning of class.

11/22. *review*

12/?? *final examination*