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## Politics and Game Theory (POLS385)

Fall 2014

Location: Tarbutton Hall 105

Hours: Mondays and Wednesdays 5:30-6:45pm

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### Description

Game Theory studies how individuals pursue their goals in situations in which the best course of action depends on the behavior of others. Games like tic-tac-toe, chess, and poker are examples of interactions that can be examined using Game Theory. However, the tools that we will learn in this course can be more broadly applied to many political and economic phenomena. Candidates competing for votes, arms races, public good provision, and bargaining are some of the many applications that we will study.

### Prerequisites

In principle, anyone who attends class regularly, reads the assigned book sections, works through the problem sets, and asks for help when something is not clear, should do well in this class. This course assumes no prior mathematical knowledge beyond high school algebra. However, we will be applying rigorous reasoning and the more comfortable you feel with logical analysis, the easier it will be to understand the class material.

### Grading

- 20% Homework assignments: There will be (approximately) eight problem sets that will be due in class. No late homework will be accepted. Every two problem sets I will randomly select one of them to be graded (the other will not be graded). At the end of the semester, you may drop one of the four graded assignments to calculate your grade.
- 50% Midterms: There will be two midterms (25% each). Both of them will take place in class: the first one on Wednesday, October 1, and the second on Monday, November 3.
- 30% Final: There will be a non-cumulative final on Wednesday, December 17.

### Collaboration

You are allowed to discuss problem sets in small groups. However, each student must turn in their own work. Do not simply copy the work of others. It does you, the person who gives you his or her homework, or me, no good. I am required to report such cases to the Honor Council.

## Readings

There is one required textbook:

- Osborne, Martin J. *An Introduction to Game Theory*. Oxford University Press.

Optional textbooks that you may consult are,

- Watson, Joel. *Strategy: An Introduction to Game Theory*. W.W. Norton & Company.
- Dutta, Prajit K. *Strategies and Games: Theory and Practice*. MIT Press.

## Outline

- Topic 1. Strategic Form Games (8/27-9/29)
  - Dominated actions
  - Nash equilibrium
  - Mixed strategies

Midterm 1 (10/01)

- Topic 2. Extensive Form Games (10/06-10/22)
  - Strategies
  - Subgame perfect Nash equilibrium
  - Backward induction
- Topic 3. Games of Imperfect Information (10/27-10/29)
  - Information sets
  - Equivalence between extensive and strategic forms

Midterm 2 (11/03)

- Topic 4. Games of Incomplete Information I (11/05-11/10)
  - Bayesian games
- Topic 5. Games of Incomplete Information II (11/12-11/24)
  - Weakly sequential equilibrium
  - Signaling games
- Topic 6. Repeated Games (12/01-12/08)
  - Finitely repeated games
  - Infinitely repeated games

Final (12/17)