

University of Pennsylvania  
Fall Term 2021

## **ECON 212- Game Theory**

**Lectures:** Tuesdays and Thursdays 8.30-10.00, in PCPE AUD.

**Professor:** David Dillenberger, 619 PCPSE, [ddill@sas.upenn.edu](mailto:ddill@sas.upenn.edu)  
Office hours: Tuesday 2.15-3.30

**TA:** Alice Gindin, [agindin@sas.upenn.edu](mailto:agindin@sas.upenn.edu)  
Office hours: Wednesday, 4.00-5:30

**Course home page:** usual Canvas: <https://canvas.upenn.edu/>

**Prerequisites:** Econ 101 and Math 114/115, in a *previous* semester.

**Required textbook:** Watson, J., ``Strategy: An Introduction to Game Theory'' (W.W. Norton) third edition. Copies of this book are available in the University of Pennsylvania book store.

**Lecture notes:** Slides will be posted the day before lecture.

There will be **no class** on Nov. 23 (Tuesday). The class of Sept 16 (Yom Kipur) will be recorded on Zoom and posted online so that you can view it at your convenience.

### **COURSE DESCRIPTION**

This course is about strategically interdependent decisions. In such situations, the outcome of your actions depends also on the actions of others. When making your choice, you have to think what the others will choose, who in turn are thinking what you will be choosing, and so on. As social scientists, we focus on human interaction, and we shall assume that people behave in a rational, deliberate manner. Game Theory offers several concepts and insights for understanding such situations, and for making better strategic choices. We study the theory and some of its applications to economics, political science, and law.

### **GRADING**

**Problem sets:** There will be **six** problem sets; your lowest problem set score will be dropped when computing your course grade. **The best five** problem sets **count for 20%** of the course grade (4% each). No late submissions are allowed.

**Exams:** There will be two (non-cumulative) in class midterm examinations and a (comprehensive) final examination. **Each midterm exam counts for 25% of the course grade. The final exam counts for 30%.** If you are unable to take one of the midterm exams *for an*

*excused reason*, the final exam will count for 55% of your course grade. All exams are closed book, notes, calculators, and mobile phones.

**Exams dates:** Midterm 1 on **October 5 (Tuesday)**; midterm 2 on **November 16 (Tuesday)**, in class. The lectures before the midterms (September 30 and November 11) will be reviews. Final exam PRELIMINARY date is **December 21, 9am-11am**. Please check <https://srfs.upenn.edu/sites/default/files/publisher/Fall-2021-Preliminary-Final-Examination-Schedule.pdf> for updates.

## THE FINE PRINT

- (1) Please read carefully the Departmental Policies at <https://economics.sas.upenn.edu/undergraduate/course-information/course-policies>
- (2) Students have two weeks from the day in which examinations are returned to report errors in grading and/or to request that problems be re-graded. If a student submits his/her exam for re-grading, then the student's entire exam will be re-graded (with no guarantee of a higher total score).
- (3) Students should attend and participate in class; their mobile phones and other devices should not. The professor will employ the necessary means to discourage classroom distractions.
- (4) **2021 Specific:** recall that all of us (including myself) are required to wear masks at **all** times. This also means that eating and drinking (except with a straw) are not permitted in classroom.

## COURSE OUTLINE (Not all topics/chapters will be covered)

### 1. Representing Games

#### Extensive form, strategies

Required reading: Watson, Chapters 1-3

#### Normal form, beliefs

Required reading: Watson, Chapter 3-4

### 2. Static Games

#### Best response, rationalizability, applications

Required reading: Watson, Chapters 6-8

#### Nash Equilibrium, applications

Required reading: Watson, Chapters 9-10

#### Mixed strategies, Minimax

Required reading: Watson, Chapters 11-12

#### Contract and law\*

Required reading: Watson, Chapter 13

### 3. Dynamic Games

#### **Extensive form, backward induction, SPE**

Required reading: Watson, Chapters 14-15

#### **IO applications**

Required reading: Watson, Chapters 16-17

#### **Bargaining**

Required reading: Watson, Chapters 18-19

#### **Negotiation equilibrium\***

Required reading: Watson, Chapters 20-21

#### **Repeated games, applications**

Required reading: Watson, Chapters 22-23

### 4. Information

#### **Random events and incomplete information**

Required reading: Watson, Chapters 24

#### **Risk and contracting**

Required reading: Watson, Chapter 25

#### **Bayesian equilibrium, applications**

Required reading: Watson, Chapters 26-27

#### **PBE, applications**

Required reading: Watson, Chapters 28-29