

University of Pennsylvania  
Fall Term 2023

**ECON 0120/PPE 3001 - Strategic Reasoning**

Lectures: Tuesday and Thursday 10:15-11:45AM, in [COLL 200](#).

Professor: David Dillenberger [ddill@sas.upenn.edu](mailto:ddill@sas.upenn.edu)

Office hours: Tuesday, 1.15-2.30 pm in PCPSE 619

TA1: Marcus Tomaino [tomaino@sas.upenn.edu](mailto:tomaino@sas.upenn.edu)

Office hours: Tuesday, 2:30-4:00PM in PCPSE 510

Recitation 1: Monday, 5:15-6:15PM in [MCNB 395](#)

Recitation 2: Tuesday, 7:00-8:00PM in [MCNB 309](#)

TA2: Joseph Huang [jhuangsa@sas.upenn.edu](mailto:jhuangsa@sas.upenn.edu)

Office hours: Wednesday, 3:30-5:00PM in PCPSE 625

Recitation 1: Wednesday, 8:30-9:30AM in [MCNB 410](#)

Recitation 2: Wednesday, 5:15-6:15PM in [MCNB 410](#)

Additional TAs: Natacha Spitzer [nspitzer@upenn.edu](mailto:nspitzer@upenn.edu) and Zhuoqun Hao  
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Course home page: usual Canvas: <https://canvas.upenn.edu/>

PLEASE READ CAREFULLY the Departmental Policies at both  
<https://economics.sas.upenn.edu/undergraduate/course-information/course-policies>  
and <https://ppe.sas.upenn.edu/study/curriculum/ppe-policies>

NOTE: This course may NOT be taken concurrently with or after ECON 4100 (formerly 212).

NOTE: You must have taken ECON 0100 (formerly 001).

**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. Game Theory offers several concepts and insights for understanding such situations, and for making better strategic choices. This course will introduce and develop some basic ideas from game theory, using illustrations, applications, and cases drawn from business, economics, politics, and sports. Some interactive games will be played in class. There will be little formal theory, and the only pre-requisite is some high-school algebra and having taken ECON 0100 (formerly 001). However, general numeracy (facility interpreting and doing numerical graphs, tables, and arithmetic calculations) is very important.

NOTE: This course will also be accepted by the Economics department as an Econ course, to be counted toward the Minor in Economics (or as an Econ elective).

## **TEXTBOOK**

Avinash Dixit, Susan Skeath and David McAdams (henceforth DSM), *Games of Strategy*, 5th edition, 2020

## **GRADING**

**Problem sets:** 5 homework assignments during the term, due about once every two weeks, depending on our progress. **The best 4** will comprise **15%** of the course grade.

**Midterm exams:** There will be two (non-cumulative) midterm examinations. **Each midterm exam** counts for **25%** of the course grade.

**Midterm exams schedule:** October 3 (Tuesday), November 14 (Tuesday).

**Final exam:** There will be a (comprehensive) final examination. **The final exam** counts for **35%** of the course grade.

**Final exam schedule:** TBA.

- If you are unable to take one of the midterm exams for **an excused reason**, as specified in the departmental policies, the final exam will count for 50% of your course grade and the other midterm for 35%. There will be no make-up exams or other accommodations. All exams are under the university's code of academic integrity

**The overall grading for the course will, roughly, be on a curve.** About 35%-40% of the students will be in the A's; about 45%-50% in the B's, and the rest in C's and under.

## **THE FINE PRINT**

- (1) Students have **one week** from the day in which examinations and problem sets 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).
- (2) 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.
- (3) Attendance is required but will not be recorded. You are responsible to ALL material that was covered in class and in the precepts.

## **COURSE OUTLINE (ORDER OF TOPICS MIGHT CHANGE)**

### **1. INTRODUCTION AND MOTIVATION**

Topics: Decisions (impersonal environment) and games (environment has other strategic actors whose choices interact with ours). Some dimensions of classification of strategic interaction

Required reading: DSM, Chapters 1 and 2

### **2. GAMES WITH SEQUENTIAL MOVES**

Topics: Game trees, Rollback equilibrium, Bargaining

Required reading: DSM, Chapter 3. DSM, Chapter 17 (sections 3-6)

### **3. SIMULTANEOUS-MOVE GAMES**

Topics: Dominant strategies, Dominated strategies, Nash equilibrium.

Required reading: DSM, Chapters 4-5

### **4. COMBINING SEQUENTIAL AND SIMULTANEOUS MOVES**

Topics: Moving advantage, Subgame perfect equilibrium.

Required reading: DSM, Chapters 6

### **5. RANDOMIZATION**

Topics: Mixed strategies. Their distinct roles in zero-sum and non-zero sum games.

Required reading: DSM, Chapter 7

## **6. SOCIAL COORDINATION AND CONFLICT**

Topics: Multi-person dilemmas. Harmful external effects: congestion and pollution. Beneficial externalities, strategic complementarity. Role of policy, social conventions etc.

Required reading: DSM, Chapter 11

## **7. THE PRISONERS' DILEMMA AND REPEATED GAMES**

Topics: Dominant strategy equilibrium in single play. Tacit cooperation in repeated play. Tit-for-tat and other strategies. Examples from business competition, international negotiations.

Required reading: DSM, Chapter 10

## **8. UNCERTAINTY AND INFORMATION**

Topics: Incentives to reveal and conceal private information, and strategies for doing so: signaling and screening. Design of contracts and incentives.

Required reading: DSM, Chapters 9 and 14

## **9. VOTING IN ELECTIONS AND LEGISLATURES**

Topics: The median voter theorem and its limitations. Agenda manipulation.

Required reading: DSM, Chapter 16

## **10. CONTRACTS, LAW, AND ENFORCEMENT IN STATIC SETTINGS**

Topics: Complete contracting in discretionary environments. Contracting with court-imposed breach remedies. Expectation damages, Reliance damages.

Required reading: Lecture notes

## **11. (if time permits) AUCTIONS**

Topics: Different types of auctions. Strategies for bidders and sellers. Truthful revelation of preferences

Required reading: DSM, Chapter 15