Strategic Reasoning
PPE 3001/Econ 0120

Edicson Luna

August 15, 2025

Class Organization

Instructors

- Instructor: Edicson Luna, third-year student in the Ph.D. in Economics.
  Research interests: Development, labor, urban economics.
  email: edicson@sas.upenn.edu

- TA: Julia Reynhold, third-year student in the Ph.D. in Economics.
  Research interests: Crime, urban economics.
  email: juliarei@sas.upenn.edu

Times

- Classes are 1 hour and 30 minutes long.
  + 40 minutes of asynchronous content designed to reinforce the material (clarifications and examples).
  Classes will be recorded to help people in different Time Zones. Link Recordings

- Links for classes and Edicson's office hours:
  Join Zoom Classes Meeting
  Classes: M/W/F 7 - 8:30 PM.
  OH: M/F 6:15 - 7 PM. (starting on June 2)

- Link for Julia's office hours:
  Join Zoom Julia's OH
  Tuesdays 7:00–8:30 PM

Ed Discussion

- We will use **Ed Discussion** as our main platform for Q&A. Both Julia and Edicson will be actively monitoring your posts. We strongly encourage you to participate and not be afraid of making mistakes—this is part of the learning process.

- Link: Ed Discussion

- Please do not email us with questions about course content. The purpose of using Ed Discussion is to allow everyone to benefit from shared questions and answers, improving overall efficiency.

- For personal matters—such as a medical emergency on the day of a quiz or midterm—please contact us directly via email.

Grading

- Problem Sets (2): 30%
  Deadlines: June 13 and June 27
- Midterm Exam 1: 25%
  Date: Weekend June 14-15
- Midterm Exam 2: 25%
  Date: Weekend June 28-29
- Quizzes (3): 15%
  Dates: June 2, June 9, June 23
- Presentations: 5%
  Dates: June 30 and July 2 (last two classes)
- Up to 5% bonus: Participation in Ed Discussion.

Grading

- You may post questions anonymously on Ed Discussion. However, we won't be able to identify you, and you will not receive bonus points for participation.

- Problem sets and midterms will be graded by Julia. Regrade requests should also be directed to her, and the entire assignment will be re-evaluated (note: the final grade may increase, decrease, or remain the same).

- Quizzes are 20 minutes long and must be completed within the designated time window. They are graded automatically and cannot be reviewed or regraded.

- Later, we will publish a guide for the presentations.

- approximately 40% of students will receive an A, around 50% a B, and the remaining students a C.

Policies

For university policies on attendance, exams, academic integrity, and grading, refer to:

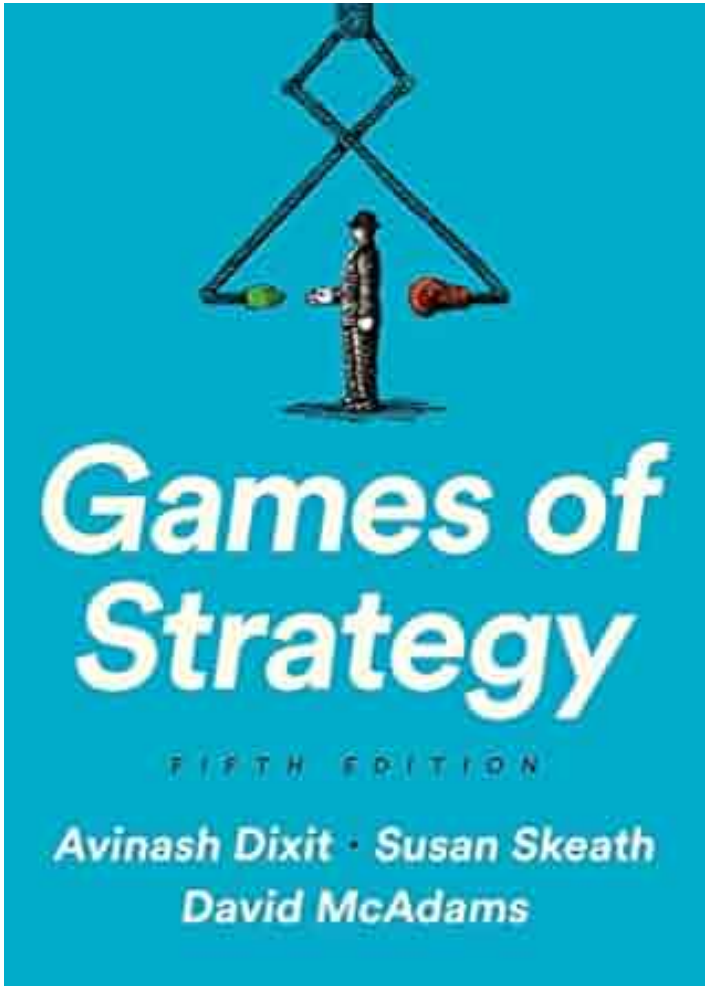
- `https://economics.sas.upenn.edu/undergraduate/course-information/course-policies`
- `https://ppe.sas.upenn.edu/study/curriculum/ppe-policies`

Questions?

Class Description

Book

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



What is a game of strategy?

The games include three components: *skill*, *chance*, and *strategy*.
Think about a soccer player during a free kick

- **Skill:** Scoring from a free kick requires the ability to curve the ball over the defensive wall while still keeping it on target.
- **Chance:** A ball aimed at the top corner of the goal might hit the crossbar, the goalposts, or go in — all depending on luck.

  What's the difference between the following two cases?
  Link 1, Link 2
- **Strategy:** The free-kick taker has several options and must use strategy to mislead the defense and goalkeeper.
  What strategy did the player use? Link 3

Strategy

Strategic thinking is about making decisions while anticipating how others—who are also thinking strategically—will act in the same situation.

Rationality means thinking before acting, based on clear objectives and reasoning.

This class is about game theory—the study of how rational individuals interact and choose strategies in settings where the outcome depends on the choices of others.

Some examples of strategic games

Some examples of strategic games

- Two students are on a trip and decide they're too tired to study. Strategically, they agree not to take the exam and plan to tell the professor they had a flat tire.

  The professor suspects they might be lying and comes up with a clever way to test their honesty. He writes just one tricky question on the makeup exam. What do you think it is?

  "Which tire?"

  What's the moral of the story?

Some examples of strategic games

Our Approach

One way to learn is through stories or examples that follow familiar patterns. The goal is that when you face a similar situation, you'll know *how* to act. This is the logic behind the *case study* approach, widely used in Law and Business schools.

Another path is to build a general *theory* of strategic interaction—what economists and political scientists typically do. The challenge is connecting theory to real life.

Yet theory has a key advantage: it helps you understand the *why* behind outcomes. With that insight, you don't need dozens of examples to act wisely.

Although the book suggests it follows a balanced route between case studies (*how*) and theory (*why*), my impression is that this class leans more toward the latter.

Games of Strategy

Classifying Games

Games can be classified along several key dimensions:

- Is there alignment of interests, or is there conflict?
- Are moves made sequentially or simultaneously?
- Are the rules fixed, or can they be manipulated?
- Do players have complete information? Is it equally distributed?
- Is the game static (one-shot) or dynamic (repeated/intertemporal)?
- Is there any form of enforcement or punishment mechanism?

Alignment vs. Conflict

Example: Paris Agreement.

- **Alignment:** All countries benefit from preventing climate change — a stable environment, fewer disasters, and long-term sustainability.
- **Conflict:** Emission reductions are costly in the short run. Poorer countries, in particular, may prioritize growth and development over environmental goals.
- **Strategic Challenge:** Each country prefers others to act while it reaps the benefits — a classic free-rider problem. Without enforcement or penalties, cooperation may unravel.

Sequential vs. Simultaneous Games

- **Sequential Game: Asking Someone Out**
  A guy decides whether to ask a girl out. She then responds after observing his action. He can anticipate her likely reaction based on signals or past behavior.
  One player moves first; the other reacts.

- **Simultaneous Game: Penalty Kick in Soccer**
  The kicker and the goalkeeper both choose their action (left, center, right) at the same time. Neither sees the other's choice before acting.
  Both players move without knowing the other's choice — pure strategy interaction.

Fixed vs. Manipulable Rules

- **Fixed Rules:** Think of games like Chess or Monopoly - all players know the rules from the start, and no one can change them mid-game. Strategy happens within the structure.

- **Manipulable Rules:** In international trade or politics, powerful players may change the rules. For example, a country may raise tariffs or rewrite regulations to protect its own industries, shifting the structure of the game in its favor.

  When players can influence the rules themselves, the strategic game becomes even more complex — it's not just about playing well, but about shaping the game.

Information: Incomplete vs. Unequally Distributed

- **Incomplete Information: Weather and Outdoor Plans**
  You plan a picnic but don't know whether it will rain. Everyone is equally uncertain — the information is simply unavailable to all.
  The game is played under uncertainty.

- **Unequally Distributed Information: Job Hiring**
  An employer must decide whether to hire a candidate. The candidate knows their own true abilities and motivation — the employer does not.
  One player has private information — creating strategic asymmetries.

One-shot vs. Repeated Games

- **One-shot Game: Selling a used phone online**
  You sell a phone on a platform where you'll never interact with the buyer again. There's a temptation to exaggerate the quality — no long-term consequences.
  No future interaction means little incentive to build trust.

- **Repeated Game: Running a small shop in your neighborhood**
  Customers come back regularly. If you cheat or overcharge, they'll stop coming — and may tell others.
  Long-term relationships create incentives to be honest and build a good reputation.

- **Question:** Why might players behave more cooperatively when they expect to interact again?

Cooperative vs. Noncooperative Games

- **Cooperative Games:** Players can form binding agreements and coordinate strategies. The focus is on what coalitions will form and how gains will be divided.
  Example: Two firms legally forming a cartel to fix prices.

- **Noncooperative Games:** Players act independently and cannot make enforceable agreements. The focus is on strategic choices given the incentives of others.
  Example: Firms choosing prices in a Cournot setting.

- **Important Caveat:** Cooperation can still emerge in noncooperative games — especially in repeated interactions or when trust and reputation matter.
  Example: In repeated Prisoner's Dilemma, players may choose to cooperate to sustain long-term benefits.