

Fall 2024

## Economics 4450: Industrial Organization

This is an advanced undergraduate course studying firm decision-making, with a focus on the role of information in markets and the technology and e-commerce sectors. We will explore how information enhances the scope for trade, including how firms collect and aggregate information about consumers' preferences to price discriminate and tailor product recommendations, how designing rating systems that facilitate communication between consumers can overcome moral hazard and improve trade, and how information affects firms' abilities to compete and collude with each other. We will also discuss the unique features of information goods—for example, online content, music or data about consumer behavior—including how to produce, price and sell information. Material will be a combination of economic models and applications to specific firms or industries. The goal is to provide a solid theoretical base to rigorously analyze firms and industries, identify distinct features of technology and e-commerce industries, discuss real-world applications of these formal models, and develop your analytical skills.

The intersection of information and technology in markets is an exciting topic, and an active area of research within microeconomics. I hope that you will come to share my excitement for the novel questions and insights that arise in these settings!

### Instructors.

**Professor:** Aislinn Bohren, [abohren@sas.upenn.edu](mailto:abohren@sas.upenn.edu)

**TA:** Natacha Spitzer, [nspitzer@sas.upenn.edu](mailto:nspitzer@sas.upenn.edu)

### Important Dates.

- Midterm 1 October 14 (in class)
- Midterm 2 November 25 (in class)
- No class 9/16, 11/27 (Friday schedule)
- Presentations December 9 and course final exam slot (TBD)
- Final project due December 19 at 11:59pm

### Class Structure.

Each week will consist of a unit that includes a mix of required readings from academic journals, review articles, and the news. Practice problems will accompany the instruction. All material will be posted on Canvas.

- **Lecture:** Mon and Wed 3:30-5:30pm
  - Accompanied with lecture notes and slides.
  - Lectures will be recorded, but in person attendance is strongly recommended and participation is a component of the grade.

- **Office Hours:**
  - Professor Bohren: Tuesday 1-2pm (PCPSE 501)
  - Natacha: Friday 9:30-11:30am (PCPSE 500)

## **Assignments.**

Submit all assignments on Canvas.

**Problem Sets.** There will be four problem sets. These assignments will develop your problem solving skills and build the skills you need to succeed on the exams. The assignments can be discussed with classmates, but should be written and submitted individually. Answers will typically be posted to canvas the day the problem set is due. As a result, late problem sets will not be accepted.

- **Due Mondays:** 9/16, 9/30, 11/4, 11/18 at 3:15pm

**Exams.** There will be two in-class midterms. There is no final exam, but presentations will be held during the final exam slot.

- **Midterm 1:** Monday October 14
- **Midterm 2:** Monday November 25

**Final Project (in groups).** A main requirement for the class is a case-study project. The paper portion of the project is due on December 19. A shorter proposal of what your plan for the project is due October 23. Students will present their projects during the last class and final exam period. Details on what is expected for this project will be provided in a separate handout.

- Group and Firm Selection: by September 20
- Proposal: due October 23
- Presentations: December 9 (in class) and final exam period
- Final Paper: due December 19

**Participation.** You will receive credit for participation, including during class discussions and activities and on piazza.

## **Grade Breakdown.**

- Problem Sets: 20%
- Midterms: 50% (25% each)
- Final Paper & Presentation: 25%
- Participation: 5%

## Other Details.

**Correspondence.** We will use piazza to facilitate communication with your classmates. Post all content-related questions about problem sets, projects and lecture on piazza. This is a great way to collaborate with classmates. Course instructors will monitor, and occasionally post, on the forum. Piazza will also help instructors to identify areas of difficulty or interest for students and hone lecture to focus on these areas.

<https://piazza.com/upenn/fall2024/econ4450>

Use email for correspondence that is not appropriate for piazza. *Include Econ 4450 in the subject line.*

**Text.** There is no required textbook for the class. The optional textbook is:

Lynne Pepall, Dan Richards and George Norman, *Contemporary Industrial Organization: A Quantitative Approach*, 1st Edition.

**Prerequisites** Econ 2100 (intermediate microeconomics); Math 1410 or 1510 or 1080. Econ 2300 is recommended. Econ 4450 assumes that students have taken multivariate calculus and have basic knowledge of probability. A strong understanding of these mathematical tools is crucial to succeed in the course.

**Course Policies & Support.** The [Economics Departmental Course Policies](#) outline rules about missed assignments, grading appeals, academic integrity, etc. You are responsible for familiarizing yourself with these policies.

If anything arises that impacts your ability to complete an assignment or participate in the course, please reach out to me. If you are feeling overwhelmed or having difficulty coping at any point, Penn has resources available to help you. CAPS is providing virtual counseling (<https://caps.wellness.upenn.edu/>).

## Outline of Topics.

Below is a brief overview of the main topics that we will cover in the course. A detailed schedule of the topic for each week will be posted on the Canvas homepage and updated throughout the semester.

1. **Market Structure:** an overview of market structure and market power, including monopoly, monopsony and Antitrust Law.
2. **Internet Markets and Information Goods:** how information as a good differs from standard consumer goods, new issues that arise for internet firms, the Long Tail Theory of Demand, utilizing the vast troves of data generated by online consumers.

3. **Pricing in Online Markets:** using consumer data to price discriminate, peak-load pricing, experience goods, product differentiation as a means of price discrimination, dynamic pricing.
4. **Product Differentiation:** how a firm decides which products to offer, both in terms of quality and variety.
5. **Switching Costs and Lock-in:** creating barriers to switching products, bargaining to acquire new customers.
6. **Advertising:** providing information to consumers to expand reach or increase value, branding and persuasive advertising.
7. **Reputation and Ratings Systems:** reputation as a means to overcome moral hazard by providing incentives for high effort or adverse selection by providing information about quality, key features of online rating systems, the value of a good reputation.
8. **Collusion and Cartels:** oligopoly models (Bertrand, Cournot); how firms can collude to set higher prices.