Econ 4490: The Digital Economy

University of Pennsylvania, Spring 2024

Course Syllabus

Instructor:	Juan Camilo Castillo	**Time:**	Tue & Thu 10:15 – 11:45 am
Email:	jccast@upenn.edu	**Location:**	TOWN 303

Teaching assistant

Eliana Sena
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Office hours

Instructor:
Thursdays 1:00-3:00 pm
PCPSE 629

Teaching assistant:
Mondays 9.30-11.30 am
PCPSE 500

Course description This is an advanced undergraduate course on the digital economy. Our two main goals are (a) to understand how people and companies interact in digital markets and (b) to understand how digital markets should be designed and regulated. The course uses a combination of theoretical modeling and empirical evidence in order to achieve those goals. We analyze some key features that are prevalent in digital markets, including price discrimination, network effects, two-sided markets, search and matching, reputation systems, and the use of data. We also zoom in on individual markets, such as e-commerce, media platforms, and the gig economy.

Prerequisites Econ 101 (Intermediate Microeconomics), Econ 104 (Introduction to Econometrics), Math 114 or 115 (Calculus, Part II)

Class structure The class and exams will take place in person. Canvas will be used as the main form of communication for the class as well as for problem sets.

Communication The official source of communication will be Canvas, where all course materials will be posted. All class announcements will be made through Canvas. If you have questions about content or logistics, you should ask them on Ed Discussion (you can post anonymously, but the TA and the instructor will be able to see your name). We will monitor Ed Discussion forums, but we expect fellow students to be active answering questions. If you have a question about a sensitive matter or something you prefer not to make public, you are welcome to reach out directly to the TA or instructor using the Canvas inbox.

We will stop answering substantive questions (as opposed to questions about logistics) about assignments *24 hours before the assignment is due*, and we will stop answering substantive questions about exams *24 hours before the exam*. The only exception will be clarifying mistakes or ambiguities in the description of assignment question or exam logistics.

Readings There will be no course textbook. The class will follow a variety of readings, including papers, newspaper articles, and book chapters. Students are expected to do the readings before the class. Reading content may be tested on exams. A reading list will be posted on Canvas and will be updated as the semester goes by. The list of readings for every lecture will be updated at least one week prior to the lecture.

Grading policy There will be three midterm exams, each one of which will determine 18% of the final grade. There will also be three problem sets, each one of which will determine 12% of the final grade. Participation will determine the remaining 10% of the grade.

Regrading You must first discuss the problem set or midterm with the TA during office hours. If you are not satisfied with the TA's explanation, you may submit a formal regrade request by email to the TA with copy to the instructor. The regrade request (a) must clearly state the specific item in dispute and contain a clear and persuasive explanation of the reason for your regrade request, and (b) must be submitted within one week (seven days) from the initial return of the problem set or exam. If the TA accepts your regrade request, he will then regrade the entire problem set or exam, not just the item in question.

Problem sets Assignments will be posted on Canvas at least three weeks before the due date. They must be submitted through Canvas before the beginning of the class (at 10:15 am). Late assignments will not be accepted. You should upload a scanned version of your writeup; you are responsible for ensuring your answers are legible. You are encouraged to consult with your classmates as you work on the problem sets. However, make sure that you work through problems yourself and ensure that any answers you submit for evaluation are the result of your own effort. Each student must submit individual write-ups of their problem set. In addition, you must list the names of students with whom you have collaborated.

Midterms Midterms will take place in person. They are closed book exams, and they are designed so you can do them in 80 minutes. If you miss one midterm because of one of the valid excuses according to the Economics Department course policies, each one of the other two midterms will count for 27% of your grade.

Participation Participation is an integral part of this course. I expect you to attend lectures, but that is not all I expect from you. I also expect you to participate actively, which can take different forms, especially asking and answering questions both during class and on Ed Discussion.

Class material The material from the class (slides, midterms, and assignments, among others) is not to be shared with anyone outside the class. In particular, you should not upload any material to any note sharing website like Course Hero.

Course outline

Preliminaries

1. Introduction (1 lecture)

Part 1: Market structure and pricing

2. IO summary (2 lectures)
3. Pricing and competition (4 lectures)
   (a) Pricing of information goods
   (b) Price discrimination and bundling
4. Platforms and network effects (4 lectures)
   (a) Network effects
   (b) Two-sided platforms

Part 2: Tools and market design

5. Data (4 lectures)
   (a) Prediction vs. causality
   (b) Machine learning and A/B testing
   (c) Privacy
6. Search and matching (1 lecture)
7. Reputation and ratings (1 lecture)
8. Auctions (1 lecture)

Part 3: Individual markets

9. Advertising (1 lecture)
10. E-commerce (1 lecture)
11. Media (1 lecture)
12. The sharing/gig economy (2 lectures)
    (a) Ride-hailing
    (b) Labor markets
    (c) Lodging
13. Generative AI (1 lecture)
14. Blockchain and cryptocurrencies (1 lecture)

Course schedule

Date	Lecture (Tuesday)	Date	Lecture (Thursday)
		Jan 18	1. Introduction
Jan 23	2. IO Summary 1	Jan 25	3. IO Summary 2
Jan 30	4. Pricing and competition 1	Feb 1	5. Pricing and competition 2
Feb 6	6. Pricing and competition 3	Feb 8	7. Pricing and competition 4
Feb 13	8. Plat. and net. effects 1 – **Pset 1**	Feb 15	9. Platforms and network effects 2
Feb 20	**Midterm 1**	Feb 22	10. Platforms and network effects 3
Feb 27	11. Platforms and network effects 4	Feb 29	12. Data 1
Mar 5	*Spring break*	Mar 7	*Spring break*
Mar 12	13. Data 2	Mar 14	14. Data 3
Mar 19	15. Data 4 – **Pset 2**	Mar 21	16. Search and Matching
Mar 26	**Midterm 2**	Mar 28	17. Reputation and Ratings
Apr 2	18. Auctions	Apr 4	19. Advertising
Apr 9	20. E-commerce	Apr 11	21. Media
Apr 16	22. Sharing/gig economy 1	Apr 18	23. Sharing/gig economy 2
Apr 23	24. Generative AI – **Pset 3**	Apr 25	25. Blockchain and cryptocurrencies
Apr 30	**Midterm 3**		

Departmental course policies All Economics Department course policies apply even if they are not explicitly listed here. Click this link to view full details.