Econ 0445: Introduction to the Digital Economy

University of Pennsylvania, Spring 2025

Course Syllabus

Instructor:	Juan Camilo Castillo	**Time:**	Tue & Thu 1:45 – 3:15 pm
Email:	Canvas inbox	**Location:**	COHN 402

Teaching assistant

Eliana Sena Sarmiento
Email: Canvas inbox

Office hours

Instructor:
Thursday 3:30 - 5:30 pm
PCPE 629

Teaching assistant:
Friday 9.30 - 11:30 pm
PCPE 141

Course description This is an introductory 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 microeconomic analysis as the main tool to achieve this goal. We analyze some key features that are prevalent in digital markets, including price discrimination, network effects, two-sided markets, search and matching, and the use of data. We also zoom in on individual markets, such as e-commerce, media platforms, and the gig economy.

Prerequisites Econ 0100 (Introduction to Microeconomics). We won't use calculus but I expect you to be comfortable with high school algebra and working with graphs and tables.

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 also 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 not answer if you write to us by email.*

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 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 15% of the final grade. There will also be six problem sets, each one of which will determine 5% of the final grade. An end-of-term paper will determine 15% of the 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 noon). 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, the other midterm will count for 20% of your grade.

Term paper Detailed information will be given closer to the deadline.

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.

Accommodations If you require any accommodations for exam taking, it is your responsibility to talk to me at least two weeks prior to the exam. If you need to make arrangements with the Weingarten Center, it is your responsibility to reach out to them well in advance (following their policy).

Course outline

Preliminaries

1. Introduction (1 lecture)

Part 1: Market structure and pricing

2. Markets and competition (2 lectures)
3. Price discrimination (2 lectures)
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 (2 lectures)
   (a) Search engines
   (b) Low search costs and prices
   (c) Matching
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. Cryptocurrencies (1 lecture)

Course schedule

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

End of term paper due May 7 at midnight

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