

Econ 239: The Digital Economy
University of Pennsylvania, Spring 2021

Course Syllabus

Instructor: Juan Camilo Castillo	Time: Tue & Thu 1:30 – 3:00 pm
Email: jccast@upenn.edu	Location: Zoom link on Canvas

Teaching assistant

Zhemin Yuan

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Office hours

Instructor:

Tuesdays 5:00 – 6:00 pm

Fridays 11:00 am – 12:00 pm

Teaching assistant:

Wednesday 8:00 – 9:00 am

Wednesday 9:00 – 10:00 am

Zoom links at the home page of the [Canvas](#) website

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 network effects, two-sided markets, search and matching, reputation systems, and the use of data. We also zoom in on individual markets, such as search engines, e-commerce platforms, and the gig economy.

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

Class structure

Synchronous activities: Lectures will take place on Zoom during the scheduled class times (Tuesdays and Thursdays 1:30–3:00 pm ET). Office hours by the instructor and the TA will take place at different times to accommodate students in different time zones.

Asynchronous activities: Lectures will be recorded and posted on Canvas so students can view them any time. Problem sets will also be posted and turned in on Canvas. We will use Piazza for online discussion.

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 Piazza (you can post anonymously, but the TA and the instructor will be able to see your name). We will monitor

Piazza 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 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 four midterm exams, each one of which will determine 15% of the final grade. There will also be four problem sets, each one of which will determine 10% of the final grade. Extra credit will be given to students that actively ask and respond questions on Piazza.

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 (1:30 pm ET). 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 during the time of the lecture. A pdf with the exam questions will be available on Canvas at the time the class starts (1:30 pm ET), and you must submit it by the time the class ends (3:00 pm ET). If you are in Asia and Oceania, please reach out at least one week before the exam so we can set up a convenient time for you to do it. Midterms are designed so you can do them in 80 minutes, with 10 extra minutes to allow for technical glitches while submitting the exam. You should upload a scanned version of your writeup. You are responsible for ensuring your answers are legible, so make sure you have downloaded and tested a scanning app before the exam starts (the Canvas mobile app has a tool to scan documents). The midterms are open book: you can use any class materials or anything on the internet, but no communication is allowed between students. If you miss one midterm because of one of the valid excuses according to the [Economics Department course policies](#), each one of the other three midterms will count for 20% of your grade.

Class material The material from the class (slides, midterms, assignments, and class recordings) 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**PART 1: GENERAL FEATURES OF THE DIGITAL ECONOMY**

1. Introduction (1 lecture)
2. Pricing and competition (4 lectures)
 - (a) IO summary
 - (b) Pricing with zero marginal costs
 - (c) Product differentiation and customer lock-in
 - (d) Price discrimination and bundling
3. Platforms and network effects (3 lectures)
 - (a) Network effects
 - (b) Two-sided markets
4. Search and matching (3 lectures)
 - (a) Low search costs and prices
 - (b) Search engines
 - (c) Recommendations and matching
5. Reputation and ratings (1 lecture)
6. Data (3 lectures)
 - (a) Prediction vs. causality
 - (b) Machine learning and A/B testing
 - (c) Privacy

PART 2: INDIVIDUAL MARKETS

7. Media (2 lectures)
 - (a) Copyrights and streaming
 - (b) News and social media
8. Advertising (1 lecture)
9. E-commerce (2 lectures)
 - (a) Customization
 - (b) Auctions
 - (c) Payment systems
10. The sharing/gig economy (2 lectures)
 - (a) Ride-hailing
 - (b) Labor markets
 - (c) Lodging

Course schedule

Date	Lecture (Tuesday)	Date	Lecture (Thursday)
		Jan 21	1. Introduction
Jan 26	2. Pricing and competition 1	Jan 28	3. Pricing and competition 2
Feb 2	4. Pricing and competition 3	Feb 4	5. Pricing and competition 4
Feb 9	6. Plat. and net. effects 1 – Pset 1	Feb 11	7. Platforms and network effects 2
Feb 16	Midterm 1	Feb 18	8. Platforms and network effects 3
Feb 23	9. Search and matching 1	Feb 25	10. Search and matching 2
Mar 2	11. Search and matching 3 – Pset 2	Mar 4	12. Reputation and ratings
Mar 9	Midterm 2	Mar 11	<i>Spring Break</i>
Mar 16	13. Data 1	Mar 18	14. Data 2
Mar 23	15. Data 3	Mar 25	16. Media 1
Mar 30	<i>No class</i> – Pset 3	Apr 1	17. Media 2
Apr 6	Midterm 3	Apr 8	18. Advertising
Apr 13	19. E-commerce 1	Apr 15	20. E-commerce 2
Apr 20	21. Sharing/gig economy 1 – Pset 4	Apr 22	22. Sharing/gig economy 2
Apr 27	Midterm 4		

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