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:**	TBD

Note: This syllabus is provisional and is subject to change.

Teaching assistant

TBD
Email: TBD

Office hours

Instructor:	*Teaching assistant:*
TBD	TBD
PCPSE 629	TBD

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 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 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 20% of the final grade. There will also be three problem sets, each one of which will determine 13.33% of the final grade. Extra credit will be given to students that actively ask and respond questions on Ed Discussion.

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, each one of the other two midterms will count for 30% of your grade.

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. Artificial Intelligence (1 lecture)

14. Cryptocurrencies (1 lecture)

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