Economics GU 4251
Industrial Organization

Department of Economics, Columbia University
Pietro Tebaldi, Fall 2025
p.tebaldi@columbia.edu

Lectures: Monday and Wednesday 2:40pm-3:55pm in 517 Hamilton Hall.

Office Hours: By appointment (email instructor with subject: "***GU4251 Office Hours?***").

Graduate Student Teaching Assistants:

Gina Markov
e-mail: gm3071@columbia.edu
Recitation sections: **When scheduled - 9-10am in PUP 307**
Office Hours: Tuesday, 5-7pm, in Lehman Library (IAB), group study area.

Riccardo Martina
e-mail: rm4207@columbia.edu
Recitation sections: **When scheduled - 12-1pm in HAM 517**
Office Hours: Friday, 4-6pm, in IAB 1006A.

Course Description:

ECON GU 4251 is an intermediate (and at times advanced) undergraduate course introducing analytical tools to analyze markets for goods and services where the assumptions of perfect competition or perfect and complete information do not hold. The course uses calculus, simple geometry, and game theory to study firm pricing behavior, the determinants of market structure, how firms acquire and exploit market power, and whether these outcomes are likely to be socially optimal. Theoretical models are illustrated with real-world examples. Topics include monopoly pricing, price discrimination, oligopoly, collusion and cartel behavior, anti-competitive practices, the role of information, antitrust policy and regulation.

Some of the key concepts we will emphasize include economic incentives, marginal analysis, market efficiency (what does it mean for a market to work), strategic behavior (how to predict and respond to your rivals' decisions), and asymmetric information (what happens when others know something you do not). The hope is that the combination of theoretical structure and practical examples will be useful for understanding policy debates and thinking critically about economic policy.

Prerequisites:

ECON UN3211 and ECON UN3213 must be completed before you enroll in ECON UG 4251. Since this is a class about microeconomics it will heavily rely on concepts introduced in ECON UN3211. If you took this course a long time ago, it may be useful to refresh this material. In addition, you should be familiar with multivariate calculus and basic probability theory. If you find using mathematical notation to capture and logically refer to real-world concepts, some parts of this class might be difficult for you. Knowledge of basic econometrics will be helpful, but it is not required.

Format:

Course materials will be delivered through in-person meetings, and lectures will not be recorded. Attendance to lectures and sections is mandatory. When in class, students are expected to participate actively in discussions. The instructor highly recommends students to take notes, as this is a great first step toward learning class material. This material will be delivered through a combination of slides and blackboard notes. All materials discussed in class are subject of examinations. The content of exams is, therefore, not limited to the material posted on Coursework, but will be largely reflected in the homework assignments administered on a regular basis.

Communication:

The main channel of communication about course logistics and content will be the Canvas page:

https://courseworks2.columbia.edu/courses/226148

For assignments, TAs and instructor will stop answering substantive questions 24 hours before the due date, with the exception of clarifying questions or mistakes in the description of the assignment. Students should post their questions on the corresponding discussion forums on Canvas. Students are responsible for checking Canvas and their inbox for announcements on a regular basis. As a norm, responses to individual emails are not guaranteed unless these are to schedule office hours.

Readings:

The textbook for the course (which may be found freely available online as provided by the authors) is

Church, Jeffrey and Roger Ware, *Industrial Organization: A Strategic Approach*, 1st ed., 2000, McGraw-Hill

There may be additional readings that will be specified in class.

Evaluations:

Evaluations will be based on the four best out of five problem sets (10%), the midterm exam (40%), and the final exam (50%).

Problem sets. All assignments should be turned by uploading files on Coursework prior to the deadline. You should work on assignments in groups of two, and upload one copy of the answer listing the two names and uni of each student. You are invited to use the Canvas Ed Discussion "Looking for a HW partner" to match with your HW colleague. Late submissions will not be graded.

Midterm exam. It is going to be an in-class exam, on October 8th.

Final exam. Scheduled by the University on Wednesday, December 17th, from 1:30-3:00 PM (2.5 hours long).

Exams and re-grading:

You are responsible for checking the exam dates and avoid any conflict with other commitments. During exams, you are not allowed to consult class notes, books, cellphones, calculators, or any other material. If you notice *obvious* errors with the grading of your exam (such as errors in adding up points), let me or the TAs know. For subjective matters, I ask that you submit your regrade request in writing. The entire exam will be regraded by the instructor.

Students with Disabilities:

If you have a qualified disability and will require academic accommodation during this course, please contact the Disability Services office and provide me with a letter from them outlining the accommodations they recommend. Please do this as soon as possible after you have determined that you will take this class.

Diversity, Equity, and Inclusion:

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it.

Outline of Topics (will be updated throughout the semester):

3-Sep	Lecture		Introduction **(notes, CW 2+4.4,4.5)**
8-Sep	Lecture		The firm, demand and profit **(notes, CW 2+3)**
10-Sep	Lecture	HW 1 handed out	The firm, cost functions **(notes, CW 2+3)**
15-Sep	Lecture		Competition and monopoly **(notes, CW 2+4)**
17-Sep	Lecture		Price discrimination (1st and 3rd) **(notes, CW 5)**
22-Sep	Lecture	HW 1 due (11:59pm)	Price discrimination (2nd) **(notes, CW 5)**
23-Sep	Recitation 1.1		9-10am in PUP 307
24-Sep	Lecture	HW 2 handed out	Game theory and Nash equilibrium **(notes, CW 7)**
26-Sep	Recitation 1.2		12-1pm in HAM 517

29-Sep	Lecture		Cournot models **(notes, CW 8.2.1,8.2.2,8.2.3)**
1-Oct	Lecture		Bertrand models **(notes, CW 8.3)**
3-Oct	Recitation 2.1		12-1pm in HAM 517
6-Oct	Review	HW 2 due (11:59pm)	Pre-Midterm Review
7-Oct	Recitation 2.2		9-10am in PUP 307
8-Oct	In-Class Midterm		Midterm
13-Oct	Lecture	HW 3 handed out	Game theory and dynamic games **(notes, CW 9)**
14-Oct	Recitation 3.1		9-10am in PUP 307
15-Oct	Lecture		Repeated games and collusion
17-Oct	Recitation 3.2		12-1pm in HAM 517
20-Oct	Lecture		Measuring market power **(notes, CW 12)**
22-Oct	Lecture		Product differentiation I **(notes, CW 11-11.4)**
27-Oct	Lecture	HW 3 due (11:59pm)	Product differentiation II **(notes, CW 11.5-11.8)**
28-Oct	Recitation 4.1		9-10am in PUP 307
29-Oct	Lecture	HW 4 handed out	Mergers and horizontal antitrust **(notes, CW 23)**
31-Oct	Recitation 4.2		12-1pm in HAM 517
5-Nov	Lecture		Entry **(notes, CW 8.2)**
10-Nov	Lecture		Vertical relations and antitrust **(notes, CW 22)**
12-Nov	Lecture	HW 4 due (11:59pm)	Advertising **(notes, CW 17)**
17-Nov	Lecture	HW 5 handed out	Platforms and digital economy **(notes)**
18-Nov	Recitation 5.1		9-10am in PUP 307

19-Nov	Lecture		Innovation **(notes, CW 18)**
21-Nov	Recitation 5.2		12-1pm in HAM 517
24-Nov	Lecture		R&D and patents **(notes, CW 18)**
1-Dec	Lecture	HW 5 due (11:59pm)	Asymmetric information **(notes)**
2-Dec	Recitation 6.1		9-10am in PUP 307
3-Dec	Review		Review
5-Dec	Recitation 6.2		12-1pm in HAM 517
8-Dec	Mock exam		

Acknowledgments:

To prepare the class I used some materials kindly provided by Nano Barahona and Ignacio Cuesta.
All errors are my own.

Last update: September 10, 2025