

ECON 445: Industrial Organization

University of North Carolina at Chapel Hill

Spring 2024

pink is for dates you might want to have in your calendar

yellow is for important highlights

Course Details

Instructor:	Hashem Amireh hamireh@unc.edu I will aim to respond to emails within 48 hours. If you don't receive a response by then, email me again.
Office Hours:	Th 12 - 2 pm or by appointment at the Econ Aid Center (Garnder basement) Note: If you want to meet one-on-one (e.g. to speak about a sensitive matter), please email me.
Prerequisites:	ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Credits:	3
Class	Mo We 2:30 - 3:45 pm Gardner 307

Course Description

The course covers the causes and consequences of firms' strategic behavior, focusing on situations in which firms have market power. The main analytical tools are microeconomic theory and game theory. Topics covered include: pricing, product design, imperfect competition, collusion and cartels, firm-to-firm supply relationships, mergers, and antitrust policy. A focus of this class is to understand the different forces at play and how they can affect different agents such as firms and consumers.

Course Goals

By the end of this course, students should:

- Understand the various forces present for different competing strategic agents (e.g. firms, consumers, and governments).
- Be familiar game-theoretic concepts that are useful to modeling strategic choices made by firms.
- Be familiar with the various fundamental models used in economics to model strategic behavior among firms.
- Be equipped with the necessary skills to implement the concepts discussed in class (e.g. Lagrangian optimization).
- Be able to think critically about the concepts taught in class and how they apply in the real world.
- Be able to challenge themselves to examine shortcomings that may be present in the simple models taught in class.
- Have the necessary skills to build their own models that may be used to answer questions about firms' choices, interactions, and possible policies.

Recommended Textbook

Introduction to Industrial Organization Hardcover by Cabral, Luis M.B.

This book shall serve only as a reference. You will not be assigned any readings or questions from the textbook.

Assessment and Grading

Midterm Exams (x2)	35%
Final Exam	30%
Problem Sets (x7)	15%
Group Final Paper	10%
Class Participation	10%

Assignments

The grade for the lowest assignment will be dropped. Note that 50% of an assignment's grades will be based on effort/completion while the remaining 50% will be based on the correctness of a subset of the assignment that will be chosen randomly. Assignments should be submitted on Gradescope. As of now, problem sets will be due on Sunday nights (but that might change if I have to move some due dates).

- Problem Set 1: due Jan. 28 @11:59 pm
- Problem Set 2: due Feb. 04 @11:59 pm
- Problem Set 3: due Feb. 11 @11:59 pm
- Problem Set 4: due Feb. 25 @11:59 pm
- Problem Set 5: due Mar. 10 @11:59 pm
- Problem Set 6: due Mar. 24 @11:59 pm
- Problem Set 7: due Apr. 07 @11:59 pm

Late Assignments: If you are unable to submit an assignment by the due date due to some extenuating circumstances, you will need to contact me ahead of time.

Group Final Paper

The final paper will be done in groups of three. If you would like to form your own group of three, please email by by 11:59 pm on April 8. Otherwise, I will assign you a group randomly. The group paper is due on April 25 at 2 pm.

The general idea for the paper is to write a model for a real life situation (or an interesting plausible situation) and solve it. More details to come.

Paper details:

- About 2-4 pages long (including equations).
- Single spaced.
- 11 pt. font size.

Exams

Note that the final exam is cumulative (with more weight for topics not covered by the midterms). Midterm 2 is largely non-cumulative, however some of the concepts and tools taught *before* might come up in relation to the topics covered *after* Midterm 1.

- Midterm Exam 1: Feb. 28
- Midterm Exam 2: Apr. 01
- Final Exam (cumulative): May 2 at 8 am

Make-up Policy: As a general rule, no make-up exams are provided without a University Excused Absence. If you have a University Excused Absence to miss an exam, email me in a timely manner to arrange a make-up exam.

Class Participation

Your class participation grade is based on two aspects:

1. General participation, attentiveness, and respect for other students.
2. Students will be randomly called upon in class to answer questions about the content of the class, including coming up to the board to answer homework questions. I do not care if you give the right or wrong answer; all I care about is that you put in a good faith effort. **If there are extenuating circumstances that prevent you from solving questions in front of the class, please email me by Jan. 20 and we can discuss making an exception.**

Course Policies

- **Attendance:** Regular attendance is expected. However, while I will not be actively checking attendance, consistent lack of attendance without an excuse will adversely affect your participation grade (see "class participation" section for more details).

If you miss a class, it is your responsibility to catch up on the material covered and obtain any missed assignments or announcements from your classmates.

- **Changes to syllabus:** The instructor reserves the right to make changes to the syllabus including project due dates and test dates. These changes will be announced as early as possible.
- **Honor code:** All students are expected to follow the guidelines of the UNC honor code. In particular, students are expected to refrain from "lying, cheating, or stealing" in the academic context. If you are unsure about which actions violate that honor code, please see me or consult honor.unc.edu.
- **Generative AI:** You may use generative AI services such as ChatGPT in any capacity you want. You DO NOT need to disclose whether you have used any such services in your work.

However, you are liable for the content that these services produce (e.g. if you include text in your work that is produced by generative IA but the text includes plagiarism, lack of citations, factual mistakes, or logical fallacies, then you will be liable for those as if they are your own).

- **Accessibility:** If you have a disability and require accommodations, please contact the instructor as early as possible to make appropriate arrangements.

Course Topics and Schedule

The following is a tentative schedule of topics to be covered in this course:

Date	Day	Topic
Jan. 10	Wed	Course Introduction and Math Review
Jan. 15	Mon	No class: MLK Day
Jan. 17	Wed	Demand, production, and cost functions (and Optimization)
Jan. 22	Mon	Demand, production, and cost functions (and Optimization)
Jan. 24	Wed	Perfect competition & Monopoly
Jan. 29	Mon	Price Discrimination I: 3DPD (linear)
Jan. 31	Wed	Price Discrimination II: 1DPD (nonlinear)
Feb. 05	Mon	Price Discrimination IIIa: 2DPD (nonlinear)
Feb. 07	Wed	Price Discrimination IIIb: 2DPD (nonlinear)
Feb. 12	Mon	No class: Wellness Day
Feb. 14	Wed	Bundling
Feb. 19	Mon	Game Theory I: Simultaneous-move games
Feb. 21	Wed	Game Theory II: Sequential games
Feb. 26	Mon	<i>Review</i>
Feb. 28	Wed	Midterm 1
Mar. 04	Mon	Competition w/ homog. products I: Cournot
Mar. 06	Wed	Competition w/ homog. products II: Cournot variations
Mar. 11	Mon	No class: Spring break
Mar. 13	Wed	No class: Spring break
Mar. 18	Mon	Competition w/ homog. products III: Stackelberg
Mar. 20	Wed	Competition with homog. products IV: Bertrand
Mar. 25	Mon	Competition w/ diff. products I: Hotelling I
Mar. 27	Wed	<i>Review</i>
Apr. 01	Mon	Midterm 2
Apr. 03	Wed	Competition w/ diff. products I: Hotelling II
Apr. 08	Mon	Market Structure and Outcomes
Apr. 10	Wed	Entry and Foreclosure
Apr. 15	Mon	Game Theory III: Repeated Games
Apr. 17	Wed	Collusion
Apr. 22	Mon	Mergers and Firm Relationships
Apr. 24	Wed	Mergers and Firm Relationships
Apr. 29	Mon	<i>Review</i>

Student Support

Accessibility Resources and Service (ARS)

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with a disability and/or a chronic health diagnosis resulting in barriers to fully accessing University courses, programs and activities.

Accommodations are determined by the Office of Accessibility Resources and Service (ARS) through their Student and Applicant Accommodations Policy, which documents qualifying disabilities in accordance with applicable state and federal laws. See the ARS website (<https://ars.unc.edu>) for contact information or email ars@unc.edu.

Counseling and Psychological Services (CAPS)

UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The Heels Care Network website is a place to access the many mental health resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

Title IX Resources

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/>. Please contact the University's Title IX Coordinator (Elizabeth Hall, titleixcoordinator@unc.edu), Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators (gvsc@unc.edu; confidential) to discuss your specific needs. Additional resources are available at safe.unc.edu.

Policy on Non-Discrimination

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's Policy Statement on Non-Discrimination offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered, and that equitable and consistent standards of conduct and performance are applied.

If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (email reportandresponse@unc.edu or see additional contact info at safe.unc.edu) or the Equal Opportunity and Compliance Office at <https://eoc.unc.edu/report-an-incident/>.

Diversity Statement

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve. I appreciate any suggestions.