

ECONOMICS 445  
INDUSTRIAL ORGANIZATION  
FALL 2022

Instructor:	Marco Duarte ( <i>he/him/his</i> )
Email:	duartema@unc.edu
Office:	Gardner Hall 305-A
Office Hours:	Wed. 9–12pm, in person (you <b>must</b> have an appointment: sign up <a href="#">here</a> )
Class time & location:	TR 2:00–3:15pm, Gardner Hall 209 (Section 001) TR 3:30–4:45pm, Gardner Hall 307 (Section 002)
Midterm Exams	Midterm 1: Sept. 27th Midterm 2: Nov. 1st
Final Exam	Saturday, Dec. 3th, 8:00am (Section 001) Monday, Dec. 5th, 8:00am (Section 002)

## Overview

**Prerequisites:** ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.

In this class we will study the causes and consequences of firms' strategic behavior, focusing on situations in which the assumptions behind perfect competition do not hold. Our main analytical tools will be microeconomic theory and game theory. We will supplement our theoretical work with empirical evidence from academic research and popular media.

The topics we will study include: pricing, product design, imperfect competition, collusion and cartels, firm-to-firm supply relationships, and mergers. Within each topic we will consider the impact of firms' actions on consumer welfare. We will also consider the motivation for and impact of US antitrust law on these settings.

Economics is more a way of thinking rather than a collection of facts, and industrial organization (IO) is no exception. Our main objective is to develop the ability to use economic models to understand a broad range of problems. These models, when constructed well, can be both simple and powerful. Your ability to construct, analyze, and interpret models is best developed through practice, and our class meetings, assignments, and exams will focus on providing this practice.

I will require you to use basic calculus during this course. If you remember what a **derivative** is and how to obtain one, you will not have any problems with the math that we use here.

## Readings

There is no required textbook for this class. Your notes from class together with lecture slides will be sufficient to keep up with the course. However, if you would like to have an external reference, previous versions of this class used Introduction to Industrial Organization by Luis Cabral (2nd edition).

We will often supplement class notes with readings collected from popular media (newspapers, magazines, etc.). When assigned, these readings are **mandatory**, and you must write a **short** text (at most three paragraphs) that contains a summary and a discussion about the reading (completed before class and submitted through Canvas). I will use Canvas to distribute and collect notes, readings, homework assignments, etc. Please get familiar with Canvas ([Canvas' help page](#)) and verify that you can log on to the course page.

I also encourage you to keep up with current economics-related events. Good popular press sources for economic content include the Economist, and the Wall Street Journal, but you can find plenty of economic content on virtually any newspaper. There are also many online news sources and podcasts that are worth checking out: Planet Money, Freakonomics, FiveThirtyEight, and many more. While not all of these resources focus on IO, they are likely to provide interesting opportunities to think about the economic forces common to IO and other microeconomics areas.

## Grading

Your grade will be based on three exams and homework assignments using the following breakdown:

Midterm 1	15%
Midterm 2	20%
Final Exam	40%
Problem Sets (5x) + Writing (~9x)	25%

- Exams will be closed books and notes, and cumulative: all material that has been covered in class up to that point is fair game.
- I will not reschedule exams other than for University Approved Absences (also refer to the Attendance policy section)
  - The University Approved Absence process has been streamlined for students who test positive and must isolate due to COVID-19. Any student who tests positive at Campus Health or who reports a positive test to Campus Health will be instructed to isolate. Since this inhibits in-person attendance and can lead to incomplete coursework, students should submit a request to the University Approved Absence Office. Tests conducted at Campus Health will automatically generate a UAA form.
- In the case of a student with a University Approved Absence justification missing one of the two midterms, the final grade will be based on a reweight using only one midterm and the final exam (use this exception as a way to increase your final grade is **not** a good strategy).
- I will post problem sets on Canvas at least one week before they are due. You must upload your solution before noon of the due date using Canvas. Collaboration (in groups of at most four students) is encouraged, as long as you indicate on you submit your own writeup and indicate who you collaborated with.

- Problem sets and writing grades are based on completion. You will receive full credit (1 point) for (honestly) attempt, 0 for incomplete/missing. I will randomly select a subset of question/submission for a more detailed evaluation.
- I will post solutions for each problem set on Canvas at the same time the assignment is due. As a consequence, **no late work will be accepted**. However, you will be allowed to drop your lowest problem set and writing score (so you have the option not to turn in one).

All course grades will be stored and displayed on Canvas. It is your responsibility to insure that the grades on this course page are accurate. Re-grade requests must be provided within one week of receiving your score, and accompanied by a **written** explanation of why you think you deserve a higher score. When you submit an assignment for a re-grade, everything will be re-scored and your grade may go up or down.

Grades will be curved so that final course grades have a similar distribution to previous versions of this class.

## Policies and expectations

### Attendance policy

Engagement in the course (demonstrated through attention, comments, questions, active listening, and participation in in-class activities) is expected and a part of the learning experience. While I understand that students may not be able to attend every class, students must likewise understand that an absence from class may result in missed information and, consequently, a lower grade.

**Repeated absences** will adversely affect your grade unless they fall under one of the three categories of University Approved Absences:

1. Authorized University activities
2. Disability/religious observance/pregnancy, as required by law and approved by Accessibility Resources and Service and/or the Equal Opportunity and Compliance Office (EOC)
3. Significant health condition and/or personal/family emergency as approved by the Office of the Dean of Students, Gender Violence Service Coordinators, and/or the Equal Opportunity and Compliance Office (EOC).

**Mask use.** UNC-Chapel Hill is committed to the well-being of our community – not just physically, but emotionally. The indoor mask requirement was lifted for most of campus on March 7, 2022. If you feel more comfortable wearing a mask, you are free to do so. There are many reasons why a person may decide to continue to wear a mask, and we respect that choice.

### Honor code

I expect all students 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. You can read more about the honor code at [studentconduct.unc.edu](http://studentconduct.unc.edu). In any course, including mine, what constitutes cheating can change from one activity to another. For example, collaboration may be encouraged for an assignment but qualify as cheating during an exam. Please see my guidelines for each activity, and if you are unsure, please ask me to clarify. In remote classes, there may be many temptations for using online exchange sites, such as Chegg. Note that these sites provide

names of students who have used their materials, and they routinely cooperate with institutions around academic integrity issues. Please don't get caught up with honor code issues just because it appears to be simple and untraceable. It is not!

### **Accessibility Resources and Services**

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities.

Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Website for contact information: <https://ars.unc.edu> or email [ars@unc.edu](mailto:ars@unc.edu).

### **Counseling and Psychological Services**

If you or anyone you know is struggling with mental health, I encourage you to seek counseling. CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more. (source: Student Safety and Wellness Proposal for EPC, Sep 2018). As a prize for reading to the end of the syllabus I will add 0.5 points to the overall course score of the first five students who email me the title of their favorite book or movie.

### **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, interim – [titleixcoordinator@unc.edu](mailto:titleixcoordinator@unc.edu)), Report and Response Coordinators in the Equal Opportunity and Compliance Office ([reportandresponse@unc.edu](mailto:reportandresponse@unc.edu)), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators ([gvsc@unc.edu](mailto:gvsc@unc.edu); confidential) to discuss your specific needs. Additional resources are available at <https://safe.unc.edu>.

### **Syllabus changes**

I reserve the right to make changes to the syllabus, including assignment due dates and test dates. These changes will be announced as early as possible.

### **Course Outline**

Below is a tentative schedule for the semester. Exact dates for topics and assignments may change. If that's the case I will try to give as much advance notice as possible.

Date	Topic	Assignments	LC chapter
<b>PART 1: INTRODUCTION AND CONCEPTUAL FOUNDATIONS</b>			
Aug. 16	Course objectives and introduction		
Aug. 18	Demand, production, and cost functions	Reading 1 assigned	2, 3
Aug. 23	Perfect competition & Monopoly	PS1 assigned, <b>Writing 1 due</b>	4.1-4.4, 5.3-5.5
Aug. 25	Price Discrimination I: 3DPD (linear)	Reading 2 assigned	6.1-6.4
<b>PART 2: PRICE DISCRIMINATION</b>			
Aug. 30	Price Discrimination II: 1DPD (nonlinear)	<b>Writing 2 due</b>	6.1-6.4
Sep. 1	Price Discrimination IIIa: 2DPD (nonlinear)	<b>PS1 due</b>	6.1-6.4
Sep. 6	*** Well-being day ***		
Sep. 8	Price Discrimination IIIb: 2DPD (nonlinear)	PS2 & Reading 3 assigned	6.1-6.4
Sep. 13	Bundling	<b>Writing 3 due</b>	6.2
<b>PART 3: STATIC OLIGOPOLY THEORY</b>			
Sep. 15	Game Theory I: Simultaneous-move games	Reading 4 assigned	7.1-7.3
Sep. 20	Game Theory II: Sequential games	<b>Writing 4 due</b>	7.1-7.3
Sep. 22	<i>Review</i>	<b>PS2 due</b>	
Sep. 27	*** MIDTERM I ***		
Sep. 29	Competition w/ homog. products I: basic Cournot		8.2-8.3
Oct. 4	Competition w/ homog. products II: Cournot variations	PS3 assigned	8.2-8.3
Oct. 6	Competition w/ homog. products III: Stackelberg	Reading 5 assigned	
Oct. 11	Competition with homogeneous products IV: Bertrand	<b>PS3 due &amp; Writing 5 due</b>	8.1
<b>PART 4: DYNAMIC OLIGOPOLY THEORY</b>			
Oct. 13	Competition w/ diff. products I: Hotelling I	PS4 & Reading 6 assigned	14.1-14.2
Oct. 18	Competition w/ diff. products I: Hotelling II	Reading 7 assigned, <b>Writing 6 due</b>	14.1-14.2
Oct. 20	*** FALL BREAK ***		
Oct. 25	Market Structure and Outcomes	<b>Writing 7 due</b>	
Oct. 27	<i>Review</i>	<b>PS4 due</b>	
Nov. 1	*** MIDTERM II ***		
Nov. 3	Game Theory III: Repeated Games	Reading 8 assigned	7.3
Nov. 8	Collusion I	PS5 assigned, <b>Writing 8 due</b>	9
Nov. 10	Horizontal Mergers	Reading 9 assigned	11
Nov. 15	Vertical Relationships	<b>Writing 9 due</b>	13.1-13.2
Nov. 22	Misc. Topics	<b>PS5 due</b>	
Nov. 29	<i>Review</i>		