

Summer Session I: May 23–June 29, 2022

Economics 2100: Intermediate Microeconomics

April 6, 2022

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Office Hours: TBD

Description

Scarcity implies the need to make choices. Microeconomics is the study of how individuals and society make choices. That is, the study of how individuals respond to incentives and the resulting impact on social outcomes. This course focuses on how the terms of trade between buyers and sellers are set. This course emphasizes the development of the mathematical tools needed to reason carefully about incentives and necessitates a taste for long chains of reasoning (see below for prerequisites).

This is a challenging course, and it is important that you remain actively engaged. There is no laundry list of facts or recipe to follow. Some, but not all, of the problems are of the cookbook variety. However, the non-cookbook problems are designed to challenge your reasoning faculties rather than your ability to pattern match. The purpose is to change the way you *think*. This will be accomplished by posing questions with answers that will confound your intuition. You will need to work hard and struggle on your own with these questions before consulting the solutions. Simply inspecting the answer to a problem or following the reasoning of another is insufficient for mastering the material. True learning will arise by discovering the reasoning for yourself.

I am excited to be your instructor and look forward to supporting each of you along the way. Please do not hesitate to email me with any questions or comments. I will hold office hours via Zoom and am also available by appointment. I reserve the right to make modifications to the syllabus as needed throughout the course.

Course Material

1. *Prices and Quantities: Fundamentals of Microeconomics* by Rakesh V. Vohra.
2. Slides for each lecture will be posted on Canvas.
3. Optional for the course is: *Microeconomics: Theory and Applications with Calculus*, by Jeffrey M. Perloff, 4th or 5th Edition.
4. Perloff is not the only textbook of its kind available. There are many substitutes. For example, *Introduction to Economic Analysis* by McAfee, Lewis and Dale which is a free, open source text book available at <https://www.kellogg.northwestern.edu/faculty/dale/ieav21.pdf>

Lectures. Lectures will be pre-recorded and available on Canvas. I will post each lecture by 12:00am (Philadelphia time) on the day it is assigned (see Tentative Course Outline at the end of the syllabus). We will use in-person class times to answer questions and solve problems.

Canvas. Canvas is used to post announcements, lectures, slides, problem sets, solutions, additional handouts, and other important materials. You are responsible for regularly checking, downloading, and reading materials posted on the site, as they form an integral part of the class. **Handouts, problem sets, solutions and other material by me are *not* for distribution to those outside of the current class.** Many of these materials are on loan from professors who use them to write their textbooks. Sic Vos Non Vobis.¹

Piazza. Piazza will be used for all class discussions and questions. Any questions to do with class material and organization should be posted there. Post all content-related questions about problem sets, lectures, and the course on Piazza. This is a great way to collaborate with classmates. I will monitor, and occasionally post, on this forum. Piazza participation in answering questions (not asking) will count for 10% of your final grade.

Email. Use for correspondence that is not appropriate for Piazza. Emails will receive a response within 24 hours Monday through Friday. *Please include Econ 2100 in the subject line.*

Office Hours

I will announce a schedule for office hours when the course begins and I have a better idea of students' schedules, time zones, and needs.

Prerequisites

Introductory microeconomics and macroeconomics (Econ 1 and 2); Math 104 and Math 114 or 115 or students who have received a B+ or better in Math 104 may take Econ 101 and Math 114 or 115 concurrently. Transfer students for Math 104 must complete Math 114 or 115 before enrolling in Econ 101. All enrollment is through permission of the department.

The course assumes multivariate calculus, and a **strong** understanding of these mathematical tools is crucial to success in the course.

1. Functions and Properties of Functions

- Monotonicity
- Continuity
- Concavity and Convexity
- Logarithmic functions
- Homogeneous functions

2. Derivatives

- How to take a derivative
- Product and Quotient Rules
- Chain Rule
- Partial derivatives

3. Solving optimization problems

- Unconstrained optimization: find the extrema of a function (maxima/minima)

¹"For you, but not yours," written by Virgil in response to plagiarism by Bathyllus.

- Constrained optimization: Substitution method
- Constrained optimization: Lagrange's method
- Comparative statics of solution functions
- Comparative statics of optimal value functions

Grading

The final grade will depend on

- Problem sets. (60%)
- Piazza participation. (10%)
- Cumulative oral exam.² (30%)

Assignments

Problem sets must be submitted on Canvas by the due date and time. **No late work is accepted.** I will randomly select a question or two to grade. Grades will be posted in a timely fashion. I highly recommend that you use overleaf.com to typeset your solutions in LaTeX.

Write-ups must be your original work. You may not use materials containing solutions or partial solutions to the assignments (including solutions prepared by current or former students). If your analysis contains information from outside sources, you should properly cite those sources.

While you are required to complete the assignments individually, I encourage learning from your peers. However, this leaves room for ambiguity, so I will try to make expectations as clear as possible. In brief:

1. Discussing the *general* ideas behind the problems is permitted.
2. Writing formal solutions should be *completely individual*, done in the equivalent of separate rooms.

As discussions of general ideas gradually become more specific, some judgment is unavoidable, but here's the kind of interaction I have in mind: if a peer conveys an idea which seems central to the solution, *do not write it down.....immediately*. Approach the problem again on your own as if afresh, influenced by however much of their idea you remember. If you can re-create it without notes, you have mastered it, and I'm happy to give you credit. In this way we can let everyone help each other learn, while steering a wide berth around simple copying.

Oral Exams

Oral exams will be scheduled with each student during the final week of the course. These may be in-person or via Zoom depending on whether the student resides in the United States. The format is not yet finalized, but what I have in mind is the following: I will invite you to present your solutions to a handful of randomly chosen homework problems, and then I will ask you how you might deal with a variation. The goal of these oral exams is to assess your intuition of the core concepts covered in the course. Each meeting should last no longer than 30 minutes. More details will be provided.

²I reserve the right to administer in-person, written exams, but my intention for now is to host oral exams as done in previous summers.

How to Prepare for Exams

1. Space out your practice rather than compress into a short period. If you spread five hours of study into one hour a day, you'll remember more than if you study for five hours on one day. Memories have a short half-life and need reinforcement.
2. Practice retrieving information rather than recognizing it. Don't mistake the ability to recognize something for an ability to recall it. In an exam you don't get marks for things being familiar, you get marks for recalling relevant information and using it to answer the question.
3. Figure out what you don't know. Revision is not for reassurance but to identify what you don't know or understand.
4. Rehearse. No one has learned how to swim from YouTube. Study for an exam by writing full answers under timed conditions and then practice explaining your solution.
5. Be kind to yourself. This material is challenging, and it is perfectly normal to struggle. Stay persistent, don't give up, and eventually you will grasp the intuition. If thinking were easy, anyone could do it.

Tentative Course Outline³

DAY	DATE	TOPIC AND READINGS
Monday	5/23	Lecture 1: Introduction and the Rational Buyer Model Vohra (V): §1.1-1.4
Tuesday	5/24	Lecture 2: Monopoly, Demand Sensitivity, and Consumer Surplus V §1.5-1.7, 2.1-2.5 Perloff (P) §5.1, Chapter 11
Wednesday	5/25	Lecture 3: Monopoly (cont.) and Costs V §2.8, 2.10 P §7.1, 7.2
Thursday	5/26	Lecture 4: Costs (cont.) and Welfare V §2.6 P Chapter 11
Friday	5/27	Lecture 5: Welfare (cont.), Regulating Monopoly, and Sales Homework Assignment 1 due V §2.7, 2.11, Chapter 3 P Chapter 12
Monday	5/30	NO CLASS (Memorial Day)
Tuesday	5/31	Lecture 6: Sales (cont.) and Price Discrimination V Chapter 3 S Chapter 12
Wednesday	6/01	Lecture 7: Price Discrimination (cont.) and Strategic Behavior V Chapter 4 P Chapter 13
Thursday	6/02	Lecture 8: Game Theory V Chapter 4 P Chapter 13

³This schedule may change as the course proceeds and will be updated as needed.

Friday	6/03	Lecture 9: Imperfect Competition Homework Assignment 2 due V Chapter 4 P Chapter 14
Monday	6/06	Lecture 10: Sequential Games V Chapter 4 P Chapter 14
Tuesday	6/07	Lecture 11: Collusion V Chapter 4 P Chapter 14
Wednesday	6/08	Lecture 12: Product Differentiation Homework Assignment 3 due V Chapter 4 P Chapter 14
Thursday	6/09	Lecture 13: Preferences and Utility V Chapter 5 P Chapter 3
Friday	6/10	Lecture 14: Utility Maximization I V Chapter 5 P Chapter 3, §5.2, 5.4
Monday	6/13	Lecture 15: Utility Maximization II V Chapter 5 P Chapter 3, §5.2, 5.4
Tuesday	6/14	Lecture 16: Utility Maximization III and Perfect Competition V Chapters 5, 6 P Chapters 2, 9
Wednesday	6/15	Lecture 17: Exchange Economy Homework Assignment 4 due V Chapter 6 P Chapter 2, 9
Thursday	6/16	Lecture 18: Competitive General Equilibrium V Chapter 6 P Chapter 10
Friday	6/17	Lecture 19: Competitive Equilibria II V Chapter 6 P Chapter 10
Monday	6/20	NO CLASS (Juneteenth)
Tuesday	6/21	Lecture 20: Competitive Equilibria with Production Homework Assignment 5 due V Chapter 6 P Chapter 10
Wednesday	6/22	Lecture 21: Externalities V Chapter 7 P Chapter 17
Thursday	6/23	Lecture 22: Review Homework Assignment 6 due
Friday	6/24	Reading day
Monday	6/27	Oral Exams
Tuesday	6/28	Oral Exams
Wednesday	6/29	Oral Exams