

## **ECON 2100 (Fall 2024) Intermediate Microeconomics**

**Rakesh Vohra**

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**Lectures:** Two 1.5 hour lectures a week.

**Recitations:** For each section there is one recitation a week. In each, a TA will cover the solutions to some of the problems in the review packet that will be relevant for that week's homework. The remainder of the time is for Q&A.

**Office Hours:** Each TA will hold 2 hours of office hours each week (some of these will be conducted via Zoom) for a total of 8 hours a week. Times will be posted on CANVAS. If you plan to attend *please let the relevant person know in advance* so as to manage congestion.

My office hours are as follows:

Monday (in person): 4 pm- 5 pm

Wednesday (via Zoom): 10 am -11 am.

**Assessment:** The final grade will depend upon 6 homeworks, 3 in-class exams and one in-class final exam (**during finals week**).

**Acts of God and other Unanticipated Events:** Such as a global pandemic or illness on my part could necessitate a change. Therefore, I reserve the right to modify the syllabus to account for this.

## **Description**

Microeconomics is the formal study of how individuals respond to incentives and its effect on social outcomes. Attention will focus on how the terms of trade between buyers and sellers are set. The course emphasizes the development of the mathematical tools needed to think carefully about incentives and necessitates a taste for long chains of reasoning.

The course is *not* a laundry list of facts to be memorized or recipes to follow. Its purpose is to change the way you think. This will be accomplished by posing questions whose answers will challenge your intuition. This will require that one perform computations that, by themselves, are unimportant, but are useful to convince oneself of things that one might at first disbelieve. Regular homework assignments allow for practice at these things. Recitations will cover problems from

the file of review problems (with solutions) (*ReviewProb.pdf*) posted on CANVAS. The problems to be covered will be announced in advance via CANVAS. The problems for each session are selected to mirror those on the homework. Not all of them are of the cookbook variety. The non-cookbook problems are designed to tax your reasoning faculties rather than ability to pattern match. The class is not a spectator sport, don't approach it as such. Inspecting the answer to a problem or following the reasoning of another is insufficient to master the material; one needs to attempt problems and work through difficulties on one's own before turning to the solution. If thinking were easy, everyone would do it.

## Course Material

1. A copy of the entire slide deck is posted on CANVAS (which will be updated from time to time).
2. Optional for the course is:  
*Prices and Quantities: Fundamentals of Microeconomics*  
by yours truly. An electronic version is available through Penn libraries:  
[https://franklin.library.upenn.edu/catalog/FRANKLIN\\_9977809853803681](https://franklin.library.upenn.edu/catalog/FRANKLIN_9977809853803681)

CANVAS is used to post announcements, slides, homework assignments, video recordings 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. **These materials are *not* for distribution to those outside of the current class.** While they are for your use, they are not yours to do with as you wish. *Sic Vos Non Vobis*. The use of *Ed Discussion* for Q&A outside class and discussion of course material is encouraged but it is not to be used as a homework checking service.

**Grade:** It will depend on 6 Homeworks each graded out of 10 points (15 % of grade), three timed in-class exams graded out of 20 points (each worth 15% of grade) and one timed in-class final exam, graded out of 30 points. (40% of grade). No scores are dropped.

**Exams:** *Open book* with calculators (even scientific) permitted, but no 'smart' devices such as tablet, laptop or phone with intelligence exceeding that of a plant. Attendance is mandatory. Students who miss an exam for an allowable reason *must* report their absence on the Course Absence Reporting (CAR) System.<sup>1</sup> There are

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<sup>1</sup><https://economics.sas.upenn.edu/undergraduate/course-information/course-policies> has a list of valid excuses for missing an exam.

*no* make-up exams; students excused by me from an exam will see the weights on the *subsequent* exams and final adjusted upwards to account for the absence.

The final exam is given at the time and date set by the Registrar. No assistance may be given or received during an exam.<sup>2</sup> You are expected to abide by the Code of Academic Integrity in the completion of assignments, papers and exams.

**Homework:** Homework assignments to be submitted via CANVAS as a single PDF file on the due date. Use a scanning app like Dropbox or Genius to create the single PDF. **No late work is accepted** and there are *no* make-up homeworks. Students excused by me (see above) from an exam or homework will see the weights on the *subsequent* homeworks adjusted upwards to account for the absence.

Write-ups must be your original work. The use of materials containing solutions or partial solutions to the assignments (including solutions prepared by current or former students) is contrary to Penn's code of academic integrity.<sup>3</sup> If your solutions contain information from outside sources, you should properly acknowledge this.

While you are required to complete the assignments individually, I don't wish to discourage learning from one's peers. 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.

**Use of Algorithmic Assistants:** You may use such assistants for preparatory and proofing work. If used on an assignment, you must indicate where and how you used such tools.

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<sup>2</sup>The Economics Department Course Policies, which include rules about exam attendance, make-up exams, grading appeals, etc., are available at: <http://economics.sas.upenn.edu/undergraduate-program/course-information/guidelines/policies>

<sup>3</sup><https://catalog.upenn.edu/pennbook/code-of-academic-integrity/>

## Course Calendar

These are not fixed in stone. I reserve the right to change them to adjust to the pace of the class.

- Sept 5: Homework 1 due
- Sept 12: **Exam #1**
- Sept 26: Homework 2 due
- Oct 3: No class
- Oct 4 & 7: No recitation
- Oct 7: **Drop period ends**
- Oct 10: Homework 3 due
- Oct 17: Homework 4 due
- Oct 24: **Exam #2**
- Nov 4: **Last day to withdraw**
- Nov 7: Homework 5 due
- Nov. 14: Homework 6 due, No class
- Nov 21: **Exam #3**
- Nov. 28: No class
- Nov 29 & Dec 2: No recitation
- **Final Exam** in finals week (Dec 12-19) on the date set by the registrar.

Don't make travel or other plans before knowing when your final exam will be held.

The tentative final exam schedule will be posted here:

<https://www.registrar.upenn.edu/finals/index.html>.

## Prerequisites

Introductory microeconomics and macroeconomics (Econ 0100 and 0200); Math 1400 and Math 1410 or 1510 or students who have received a B+ or better in Math

1400 may take Econ 2100 and Math 1410 or 1510 concurrently. Transfer students for Math 1400 must complete Math 1410 or 1510 before enrolling in Econ 2100. This 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
- Total derivatives

3. Solving optimization problems

- Unconstrained optimization: find the extrema of a function (maxima/minima)
- Constrained optimization: Method of substitution and Lagrange
- Second order conditions
- Comparative statics of solution and optimal value functions

## Course Outline

**Week 1: Rational Buyer Model** Chapter 1 of *Prices & Quantities*.

**Week 2: Monopoly Pricing & Elasticity** Chapter 2 of *Prices & Quantities*.

**Week 3: Monopoly Pricing & Costs** Chapter 1 & 2 *Prices & Quantities*.

**Week 4: Welfare & Price Discrimination** Chapter 3 from *Prices & Quantities*.

**Week 5: Bundling & Versioning** Chapter 3 from *Prices & Quantities*.

**Week 6 & 7: Imperfect Competition** Chapter 4 from *Prices & Quantities*.

**Week 8 & 9: Imperfect Competition** Chapter 4 from *Prices & Quantities*.

**Week 10: Consumer Theory** Chapter 5 from *Prices & Quantities*.

**Week 11: Perfect Competition** Chapter 6 from *Prices & Quantities*.

**Week 12: Perfect Competition** Chapter 6 from from *Prices & Quantities*.

**Week 13: Perfect Competition** Chapter 6 from from *Prices & Quantities*.

**Week 14: Externalities** Chapter 7 from *Prices & Quantities*.

**Week 15: Externalities** Chapter 7 from from *Prices & Quantities*.

## How to Master the Material

1. Space your practice out rather than compressing it 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.<sup>4</sup> 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 yet has learnt how to swim from YouTube. Study for an exam by testing yourself by writing out full answers under exam conditions.

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<sup>4</sup>It works in reverse for chocolate.