**ECON 6100-001: Microeconomic Theory**

University of Pennsylvania

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Office hours: 3:45-4:45 pm Thursdays in 618 PCPE, and by appointment

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Office hours: 4-5 pm Wednesdays, and by appointment

**Emailing.** Please include “ECON 6100” in the subject line of emails to us.

**Description.** The course is designed for Wharton PhD students and undergraduate math econ majors. Its topics are listed below. The goal is to provide a solid grasp of the methods and models used in neoclassical microeconomic theory.

**Prerequisites.** Multivariable calculus (*at least* through Math 1080 or 1410), some real analysis (open, closed and compact sets, convergence, continuity), probability theory (continuous distributions, expectation), optimization (first-order, second-order conditions for constrained optima), and intermediate micro (Econ 2100). To determine if you have the mathematics prerequisites, make sure you can readily the Mathematical Appendices in our textbook *JR* (see below). Some of the basics are well covered in Martin Osborne’s math tutorial:

https://mjo.osborne.economics.utoronto.ca/index.php/tutorial/index/1/int/i

**Lectures.** TR, 1:45-3:14 pm, location TBA

**Class Structure.** Lecture slides and often corresponding lecture videos will be posted on Canvas. Most of the videos were recorded in Fall 2020, so be aware that some of the lecture material has evolved since then – I’ll alert you to major departures. I suggest you look at the slides for each class before coming to the class.

**Assessment.** Two midterms and one cumulative final exam. Eight problem sets. Each midterm counts 25% toward the course grade, the final exam 30%, and the homework 20%. If you miss one midterm for an excused absence the other midterm will count $33 \frac{1}{3} \%$, the final exam 40%, and the homework $26 \frac{2}{3} \%$.

**Homework.** No problem sets in the weeks in which there is an exam or class holiday. Study groups for doing the problems sets are encouraged, but they should be written up individually. Problem sets will be posted about a week before they are due, which will by 11:45 pm Fridays, via Canvas. Each problem set will be graded coarsely on a 0-3 scale. Late homework will not be graded. However, one of your problem sets with the lowest score will not be counted when calculating your homework score.

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1Excused absences and other course policies are discussed in detail at https://economics.sas.upenn.edu/undergraduate/course-information/course-policies
Textbooks.

The main textbook is Jehle and Reny (JR), *Advanced Microeconomic Theory*, 3rd ed. Lectures will be taken from selected topics in Chapters 1-5, as well as some outside material. JR has an excellent Mathematical Appendix — please spend time with it.

If you want to consult supplementary texts, I suggest the encyclopedic Mas-Colell, Whinston and Green, *Microeconomic Theory*. Another good one is *Microeconomic Analysis*, 3rd ed., by Hal Varian.

A very useful complete textbook on the math is Simon and Blume, *Mathematics for Economists*.

Dates

- First Lecture: 8/29
- Fall Break and Thanksgiving (no class): 10/12 and 11/23
- Problem Set Due Dates: Sept 8, 22; Oct 6, 20, 27; Nov 17; Dec 1, 8
- Exam Dates: 9/28 (Mid 1), 11/2 (Mid 2), TBA (Final Exam)

Topics

1. Introduction: Economics and Mathematics
2. Consumer Theory
   (a) Preferences and utility maximization
   (b) Expenditure minimization and duality
   (c) Demand functions: Slutsky equation and matrix
   (d) Consumer surplus and compensating variation
3. Choice Under Uncertainty
   (a) Expected utility
   (b) Risk aversion
4. Producer Theory
   (a) Technology
   (b) Profit maximization
   (c) Cost minimization and duality
5. Competitive Equilibrium
   (a) Edgeworth boxes
   (b) Existence and welfare theorems
   (c) Arrow-Debreu and incomplete markets
6. Externalities and Public Goods
   (a) Bargaining
   (b) Pigouvian taxes
   (c) Voluntary contribution
   (d) Lindahl equilibrium