Syllabus
ECON 6100-001: Microeconomic Theory
Version: August 8, 2022

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

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  Office hours: TBA, and by appointment

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

Prerequisites. Multivarible calculus (*at least* through Math 114), 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 101). To determine if you have the mathematics prerequisites, take a look at Martin Osborne's online math tutorial: https://mjo.osborne.economics.utoronto.ca/index.php/tutorial/index/1/int/i. You should know much of the math covered in it, and feel comfortable with expecting to consult it when needed during the semester.

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

Emailing. Please include "ECON 6100" in the subject line of emails to us.

Class Structure. Lecture slides and 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 may have evolved since then. The lecture slides and videos for each class will be posted in advance – you should look at them before the class. In class we will also discuss examples and solve problems.

Assessment. Nearly weekly problem sets. Two midterms and one cumulative final exam. The homework counts 20% toward the course grade. Each of the two midterms counts 25%, and the final exam counts 30%. If you have an excused absence from one midterm,[1] your homework will count $26\frac{2}{3}$%, the other midterm $33\frac{1}{3}$%, and the final exam 40%.

Homework. There will be no problem sets in the weeks in which there is an exam. 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, and they will be due by 11:45 pm Fridays, via Canvas.

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[1]Excused absences and other course policies are defined at
https://economics.sas.upenn.edu/undergraduate/course-information/course-policies.

Textbooks.

Our main textbook is Jehle and Reny (JR), *Advanced Microeconomic Theory,* 3rd ed. We will cover selected topics from Chapters 1-5. The relevant portions of JR for each set of lecture slides will be stated on the first page of the slides. 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* book on the math used in economics is Simon and Blume, *Mathematics for Economists.*

Dates

- First Lecture: 8/30
- Fall Break and Thanksgiving (no class): 10/6 and 11/24
- Problem Set Due Dates: Sept 9, 16, 23; Oct 14, 21, 28; Nov 4, 18; Dec 2, 9
- Exam Dates: 9/29 (Mid 1), 11/10 (Mid 2), and 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