

**Syllabus**  
**Econ 6100: Microeconomic Theory**  
**University of Pennsylvania**  
**This Version: August 16, 2024**

## 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.

## Logistics

**Professor:** Steven Matthews <stevenma@econ.upenn.edu>, office PCPE 618

- **Communication Protocol:** Feel free to email me, but be sure to put the course number, 6100, in the subject heading
- **Office Hours.** Fridays 1:30-2:45pm in PCPE 618, or email me for an appt

**Teaching Assistant:** Artemii Korolkov <korolkov@upenn.edu>

- **Office Hours.** TBA

**Class Time and Place.** TR 1:45-3:15am, PCPE 200.

**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>.

**Teaching Methodology.** Lectures and problem solving. Notes/slides on Canvas.

**Assessment.** Homework and three in-class exams. Each exam will count 25%, and the homework will count 25% towards the course grade. If you are unable to take an exam for an excused reason,<sup>1</sup> the other two exams and the homework will each count for 33. $\bar{3}$ %. Class participation will count in borderline cases.

**Homework Policy.** Study groups for doing the problems sets are encouraged, but they should be written up individually. There will be six problem sets. Each one will be graded coarsely on a 0-5 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. Upload to Canvas, as one pdf file, your problem set solutions by 11:45pm of the Friday due dates (see below).

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<sup>1</sup>The definition of an excused absence, departmental regrade policies, and so on can be found at <https://economics.sas.upenn.edu/undergraduate/course-information/course-policies>.

**Textbooks.** The main textbook is

(JR) Jehle and Reny, *Advanced Microeconomic Theory*, 3<sup>rd</sup> 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.*

Two supplementary and optional textbooks are

(MWG) Mas-Colell, Whinston and Green, *Microeconomic Theory*.

Varian, *Microeconomic Analysis*, 3<sup>rd</sup> ed.

An optional but *very useful* textbook on the math is

Simon and Blume, *Mathematics for Economists*.

### Important Dates

<i>Date</i>	<i>Event</i>
8/27	First Class
9/6 (F 11:45pm)	PS 1 due
9/13 (F 11:45pm)	PS 2 due
9/19	<b>Midterm 1</b>
10/3-6	Fall Break
9/27 (F 11:45pm)	PS 3 due
10/18 (F 11:45pm)	PS 4 due
10/24	<b>Midterm 2</b>
11/8 (F 11:45pm)	PS 5 due
11/22 (F 11:45pm)	PS 6 due
12/5	<b>Midterm 3</b>

### Topics

1. Introduction: Economics and Mathematics
2. Consumer Theory

Preferences and utility maximization. Expenditure minimization and duality. Demand functions: Slutsky equation and matrix. Consumer surplus and compensating variation.

3. Choice Under Uncertainty

Expected utility. Risk aversion.

4. Producer Theory

Technology. Profit maximization. Cost minimization and duality.

5. Competitive Equilibrium

Edgeworth boxes. Existence and welfare theorems. Arrow-Debreu and incomplete markets.

6. Externalities and Public Goods

Bargaining. Pigouvian taxes. Voluntary contribution. Lindahl equilibrium.