Summer 2024

# Economics 2100: Intermediate Microeconomics[1]

May, 2024

**Instructors**: Javier Tasso (jtasso@sas.upenn.edu) and Zhenxiao Chen (zxchen@sas.upenn.edu)

## Introduction

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. The course emphasizes the development of the tools needed to reason carefully about incentives and necessitates a taste (or at least patience) for long chains of reasoning (see below for prerequisites).

This course is not a laundry list of facts to memorize 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. Merely memorizing the questions and their answers is insufficient; one must understand the reasoning process by which one arrives at them. The questions change, and you will have to figure out your own answers.

The course requires you to perform computations that are useful to convince you of things that you might at first disbelieve. Regular homework assignments will aid you in these computations.

## Logistics Overview

1. Lectures are synchronous. We meet on Monday, Wednesday, and Friday at 5:15pm-7:45pm.
2. Recorded recitations will help you solve homework questions.
3. Office hours are also on zoom. Date and time TBA.
4. The final grade will be determined by two problem sets (25% each problem set) and two midterm exams (25% each exam).
    - **Exams are delivered synchronically during class time. They are open notes.**

   Provided that students meet a minimum standard to pass the class, I anticipate the grade distribution to be about 30-35% for As, 40-45% for Bs, and 15-20% for Cs.
5. There are two possibilities of insurance. Before each exam, you can turn in an optional homework assignment that is worth 5% of the final grade. If you choose to do so for the first exam, the weights are as follows: 25% for the problem set, 5% for the optional homework, and 20% for the midterm. You can do this again in the second half of the course. This assumes you do better in the optional homework than in the midterm. If you do better in the midterm, then it weights 25% and I'll disregard the optional homework.

[1] The organization of this class benefited from George Mailath's course.

6. Each class will have a homework assignment. You are not required to turn in the homework assignments, but it is expected (and in your best own interest) that you keep up with them and complete them.

**Important Dates**

There are only four deadlines described below. They will be strictly enforced. If you have an emergency and cannot sit for a midterm or turn in a problem set, please contact me as soon as you can. In most cases, a missed exam or problem set cannot be made up. I will handle exceptions to this rule on a case-by-case basis.

- Friday June 7th, **Problem Set #1** due by 5:15pm.
- Wednesday June 12th, **Midterm #1** during class time 5:15pm-7:45pm.
- Friday June 28th, **Problem Set #2** due by 5:15pm.
- Wednesday July 3rd. **Midterm #2** during class time 5:15pm-7:45pm.

**Prerequisites.**

Introductory microeconomics and macroeconomics (Econ 100 and 200); Math 1400/1410 or Math 1070/1080. This course assumes knowledge of 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 maxima/minima of a function.
    - Constrained optimization: substitution method and Lagrange's method.
    - Comparative statics of solution functions.
    - Comparative statics of optimal value functions.
4. Basic Probability
    - Basics of a discrete random variable.
    - How to find the expected value of a discrete random variable.

**Course Material**

1. Lecture slides, homework, and problem sets will be posted on Canvas.
2. The structure of the course follows the text *Microeconomic Theory Basic Principles and Extensions* by Walter Nicholson. The text is **optional**, and any edition is fine.
3. Another optional text is *Prices & Quantities: Fundamentals of Microeconomics* by Rakesh V. Vohra, 2020, Cambridge University Press. It is available online from Penn Libraries.
4. *Intermediate Microeconomics* by Hal Varian is also another optional reference.
5. *Introduction to Economic Analysis* by McAffe, Lewis and Dale is a free, open source textbook available at: https://open.umn.edu/opentextbooks/textbooks/47

**Tentative Course Outline**

The following course outline may change according to the pace of the class. Homework does not have a due date. The homework column just means you can start solving the homework after the corresponding class.

| | | | | | Suggested Reading | |
|---|---|---|---|---|---|---|
| Date | Day | Topic | Problem Set | HW | Nicholson | Varian |
| 29-May | Wednesday | Preferences and the budget constraint | | Hw #1 | N3 | V2, V3 |
| 31-May | Friday | Utility and the UMP | | Hw #2 | N4 | V4, V5, V6 |
| 3-Jun | Monday | Utility and the UMP II | | | | |
| 5-Jun | Wednesday | The EMP and the Slutsky equation | | Hw #3 | N5 | V8 |
| 7-Jun | Friday | Welfare analysis | PS #1 due | Hw #4 | | V14 |
| 10-Jun | Monday | Review | | | | |
| 12-Jun | Wednesday | Exam # 1 | | | | |
| 14-Jun | Friday | General Equilibrium – Exchange | | Hw #5 | N13 | V32 |
| 17-Jun | Monday | Producer Theory | | Hw #6 | N9-11 | V19, V21-23 |
| 19-Jun | Wednesday | Juneteenth (no classes) | | | | |
| 21-Jun | Friday | General equilibrium - Production | | Hw #7 | N13 | V33 |
| 24-Jun | Monday | Uncertainty | | | N7 | V12 |
| 26-Jun | Wednesday | Uncertainty II | | Hw #8 | N7 | V12 |
| 28-Jun | Friday | Intertemporal Choice | PS #2 due | Hw #9 | | |
| 1-Jul | Monday | Review | | | | |
| 3-Jul | Wednesday | Exam #2 | | | | |

**How to Study.**

1. The class is not a spectator sport, and it is important you 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 these difficulties on one's own before turning to the solution. If your "solution" does not agree with the provided solution, make sure you understand what you did wrong.
2. 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. Memories have a short half-life and need reinforcement.
3. Practice retrieving information rather than recognizing it. Don't mistake the ability to recognize something for the 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.
4. Figure out what you don't know. Revision is not for reassurance but to identify what you don't know or understand.
5. Participate in Canvas discussions! Either asking or answering questions will help you better understand the material.

**Academic Integrity and Ethical Behavior.**

The College of Arts and Sciences takes academic integrity very seriously. Therefore, unless otherwise specified, it is imperative that you do your own work. Any suspected violations of academic integrity will be taken seriously. Information on the academic integrity policy may be found at https://www.college.upenn.edu/academic-integrity. Violations of this policy will result in a failing grade (F) and will be reported to Office of Student Conduct.