Microeconomic Theory I
ECON 60101 (Fall 2023)
Department of Economics • University of Notre Dame

Instructor: Maciej H. Kotowski ⟨mkotowsk@nd.edu⟩
Class Meetings: Tuesday & Thursday 14:00–16:00 [JNH B071]
Instructor's Office Hours: Tuesday 16:30–18:00 [JNH 3016 or Zoom; scheduled online]

Teaching Assistant: Jacob Hukill ⟨jhukill@nd.edu⟩
Tutorial Section: Wednesday 17:30–18:45 [JNH B079]

Course Website: ⟨https://canvas.nd.edu/courses/74043⟩

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1. Overview

The first half of a year-long sequence in microeconomic theory at the graduate level. Topics include consumer and producer behavior, decision making under uncertainty, welfare analysis, and general equilibrium theory.

1.1. Audience

This course is suitable for doctoral students in economics and related disciplines. Other students with adequate preparation in mathematics and economics may enroll with the instructor's permission.

1.2. Prerequisites

The most important prerequisites for the course are a willingness for critical and creative thinking, imagination, and some grit.

Economics: Enrollment in the economics doctoral program. Other students with sufficient economics and mathematics preparation may enroll with the instructor's permission.

Mathematics: Algebra, calculus, and probability theory are used freely throughout the course. Skills in logical thinking and a willingness to follow proofs are essential.

2. Requirements and Grading

The course requirements include completion of a collection of problem sets, a midterm exam, and a final exam. Your grades on these tasks will be weighted as follows to determine your course grade.

Problem Sets	15 %
Midterm Exam	35 %
Final Exam	50 %
Total	100 %

Letter grades will be assigned based on your final weighted score.

2.1. Problem Sets

Problem sets are graded primarily for completion and only a "$\checkmark\pm$ / no credit" will be offered for feedback. You are responsible for consulting the suggested solutions to verify your mastery of the material. Earning a "$\checkmark-$" or better gives you full credit for the problem set. Sloppy, half-hearted, late, or incomplete work is unlikely to receive credit. Your lowest problem set grade will be dropped when calculating your course grade.

Unless noted otherwise, you may work in small groups (two or three students) on the problem sets. However, you must hand in independently written-up solutions. If you collaborate, identify other group members on your write-up. There is no need to type up your solutions, but sloppy work will not receive credit. Problem set due dates are the following:

Problem Set	Date Due	Problem Set	Date Due
1	August 31	6	October 31
2	September 7	7	November 9
3	September 21	8	November 21
4	September 28	9	December 7
5	October 10		

2.2. Midterm Exam

There will be an in-class, closed-book midterm exam on October 12, 2023.

If you miss the midterm exam and your absence is excusable per university policy (e.g., a documented illness), a rescheduled exam will be arranged on a case-by-case basis. Unexcused absences will receive a grade of zero for this part of the course.

2.3. Final Exam

There will be a closed-book final exam. It has been provisionally scheduled by the registrar's office for 10:30–12:30 on December 13, 2023. The exam's location will be announced when available.

If you miss the final exam and your absence is excusable per university policy (e.g., a documented illness), a rescheduled exam will be arranged on a case-by-case basis. Unexcused absences will receive a grade of zero for this part of the course.

3.   Tutorial Section

The teaching assistant will hold a weekly tutorial section. Most students will benefit greatly from attending the weekly review section.

4.   Readings and Textbooks

This course does not rely on any specific textbook. However, it is essential that you read something in preparation for each class. The textbooks below are close substitutes. You must have access to and read at least one of them regularly.

- *Microeconomic Theory* by A. Mas-Colell, M. D. Whinston, and J. R. Green.

- *Advanced Microeconomic Theory* by G. A. Jehle and P. J. Reny.

- *Microeconomic Foundations I: Choice and Competitive Markets* by D. M. Kreps.

For some lectures there are suggested readings from the following textbooks:

- *Economics and Consumer Behavior* by A. Deaton and J. Muellbauer.

- *Lecture Notes in Microeconomic Theory* by A. Rubinstein.

The syllabus includes references to articles in academic journals. These are accessible electronically through the university library. There are also "classic" references to well known monographs or journal articles. Classic readings are optional unless noted otherwise.

5.   Audio/Video Recordings

You are kindly asked to not make personal audio or video recordings of the lectures.

6. Contingency Planning

Adverse events beyond the instructor's control may affect the course. The following principles will guide this course's response and adaptation in such cases.

1. Please follow the university's health and safety guidance when on campus.

2. If in-person instruction is disrupted, be prepared to switch to dual-mode or remote instruction if mandated by the university.

3. You are expected to submit all coursework in hardcopy. In case of an absence, please contact the instructor to arrange for electronic submission.

4. In exceptional cases of a prolonged absence or a disruption to in-person instruction, take-home exams may be substituted for in-class exams at the instructor's discretion.

7. Advice

1. Understand and follow the university's Academic Honor Code.

2. Exam questions will resemble problem set questions. Look beyond the assigned class material for more practice problems.

3. Scan or photocopy your problem set answers before submitting them.

4. Read the assigned readings twice—before *and* after lecture.

5. If pressed for time, practice solving problems in lieu of memorizing a text's details.

6. Please inform the instructor of typos and suspected mistakes in course materials.

7. Please ask questions in class. Illuminating digressions are exciting.

8. Please make use of office hours. Even if you have no specific questions about the course material, please feel welcome to visit, chat, ask questions, or simply say hello.

8. Credits and Acknowledgements

This course draws on material that I was fortunate to encounter as a student, teaching assistant, and faculty. Of particular note are lectures by, teaching materials prepared by, or discussions with David Ahn, Bob Anderson, Chris Avery, Shachar Kariv, Nolan Miller, Michèle Müller-Itten, Matthew Rabin, Chris Shannon, Pete Troyan, and Richard Zeckhauser. Several lectures build on course materials originally prepared for ECON 2020a taught at Harvard University. I thank that course's teaching assistants and students whose input proved invaluable.

9. Course Calendar and Reading List

The calendar may be adjusted depending on our progress. You are expected to read essential readings. Required readings from textbooks (Mas-Colell, Whinston, and Green; Jehle and Reny; or Kreps) are close substitutes; plan to read one per lecture. Classic and supplemental readings are optional, but some lecture content draws upon these sources.

Key

   ●● *essential reading* — something you must read, period.

   • *required reading* — something you should read to appreciate the lecture.

  ○○ *classic reading* — classic books or important papers; read if you're keen.

   ○ *supplemental reading* — consult for more information, background, or interest.

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[1] August 22 / Introduction / Mathematical Preliminaries 0.

●● Gale, D., and L. S. Shapley. 1962. College Admissions and the Stability of Marriage. *American Mathematical Monthly* 69(1):9–15.

• Varian, H. R. 1993. What Use is Economic Theory? Department of Economics, University of Michigan Working Paper 93-14.
⟨https://deepblue.lib.umich.edu/handle/2027.42/101038⟩

[2] August 24 / Mathematical Preliminaries 1: Definitions and Essentials.

• Mas-Colell, Whinston, and Green, Appendices M.A–M.H, M.J.

• Jehle and Reny, Appendices A1, A2.1–A2.2.

• Kreps, Appendices 1–4.

○ Chiang, A. C., and K. Wainwright. 2005. *Fundamental Methods of Mathematical Economics.* New York: McGraw-Hill.

○ Simon, C. P., and L. Blume. 1994. *Mathematics for Economists.* New York: W. W. Norton & Company.

[3] August 29 / Mathematical Preliminaries 2: Linear Programming & Optimization.

○○ Dantzig, G. B. 1963. *Linear Programming and Extensions.* Princeton: Princeton University Press.

○ Dorfman, R., P. A. Samuelson, and R. M. Solow. 1958. *Linear Programing and Economic Analysis.* New York: McGraw-Hill. Chapters 1–3.

○ Lancaster, K. *Mathematical Economics.* New York: Macmillan. Chapter 3.

[4] **August 31** / Mathematical Preliminaries 3: Nonlinear Programming & Optimization.

- Mas-Colell, Whinston, and Green, Appendix M.K.

- Jehle and Reny, Appendix A2.3.

- Kreps, Appendix 5.

○ Lancaster, K. *Mathematical Economics.* New York: Macmillan. Chapters 4–5.

[5] **September 5** / Choice, Preferences, and Utility 1: Choice Behavior.

- Mas-Colell, Whinston, and Green, Chapter 1.

- Kreps, 1.1–1.4, 1.7–1.8.

○ Kreps, D. M. 1988. *Notes on the Theory of Choice.* Boulder: Westview Press. Chapters 1–2.

[6] **September 7** / Choice, Preferences, and Utility 2: Utility Representations.

- Mas-Colell, Whinston, and Green, 3.A–3.C.

- Jehle and Reny, 1.1–1.2.

- Kreps, Chapter 2.

○ Kreps, D. M. 1988. *Notes on the Theory of Choice.* Boulder: Westview Press. Chapter 3.

[7] **September 12** / Consumer Theory 1: Walrasian (Marshallian) Demand.

- Mas-Colell, Whinston, and Green, 3.D.

- Jehle and Reny 1.3–1.4,

- Kreps, Chapter 3.

○ Deaton and Muellbauer, 2.3.

○ Rubinstein, Lecture 4.

[8] **September 14** / Consumer Theory 2: Hicksian Demand.

- Mas-Colell, Whinston, and Green, 3.E.

- Jehle and Reny, 1.4.

- Kreps, 10.1–10.4, 10.8.

○ Deaton and Muellbauer, 2.3.

[9] **September 19** / Consumer Theory 3: Slutsky Decomposition and Comparative Statics.

- Mas-Colell, Whinston, and Green, 3.F–3.G.

- Jehle and Reny, 1.4–1.5.

- Kreps, 4.3, 11.1–11.4.

- Jensen, R. T., and N. H. Miller. 2008. Giffen Behavior and Subsistence Consumption. *American Economic Review* 98(4):1553–1577.

○ Deaton and Muellbauer, 2.4–2.5.

[10] **September 21** / Consumer Theory 4: Welfare Analysis.

- Mas-Colell, Whinston, and Green, 3.I.

- Jehle and Reny, 4.3.

- Kreps, 12.2.

○ Deaton and Muellbauer, 7.4.

○ Hausman, J. 1981. Exact Consumer's Surplus and Deadweight Loss. *American Economic Review* 71(4):662–676.

[11] **September 26** / Consumer Theory 5: Revealed Preference / Catch Up.

- Mas-Colell, Whinston, and Green, 2.F & 3.J.

- Jehle and Reny, 2.3.

- Kreps, 4.1–4.2.

○ Deaton and Muellbauer, 2.6.

○ Rubinstein, Lectures 3 & 5.

○○ Afriat, S. N. 1967. The Construction of Utility Functions from Expenditure Data. *International Economic Review* 8(1):67–77.

[**12**] **September 28** / Choice Under Uncertainty 1: Expected Utility and Other Models.

- Mas-Colell, Whinston, and Green, 6.A–6.B.

- Jehle and Reny, 2.4.

- Kreps, 5.1.

- Machina, M. J. 1987. Choice Under Uncertainty: Problems Solved and Unsolved. *Journal of Economic Perspectives* 1(1):121–154.

○○ Von Neumann, J., and O. Morgenstern. 1944. *Theory of Games and Economic Behavior.* Princeton: Princeton University Press. Chapter 3 and Appendix.

○○ Savage, L. J. 1972 [1954] *The Foundations of Statistics.* Second Revised Edition. New York: Dover.

○○ Anscombe, F., and R. Aumann. 1963. A Definition of Subjective Probability. *Annals of Mathematical Statistics* 34(1): 199–205.

○○ Allais, M. 1953. Le Comportement de l'Homme Rationnel devant le Risque: Critique des Postulats et Axiomes de l'École Américaine. *Econometrica* 21(4):503–546.

○○ Ellsberg, D. 1961. Risk, Ambiguity, and the Savage Axioms. *Quarterly Journal of Economics* 75(4):643–669.

○ Kreps, D. M. 1988. *Notes on the Theory of Choice.* Boulder: Westview Press. Chapters 4–5.

○ Rubinstein Lectures 7 8.

[**13**] **October 3** / Choice Under Uncertainty 2: Expected Utility and Other Models (con't).

[**14**] **October 5** / Choice Under Uncertainty 3: Monetary Risk.

- Mas-Colell, Whinston, and Green, 6.C–6.D.

- Jehle and Reny, 2.4.3.

- Kreps, Chapter 6.

[15] **October 10** / Theory of Production 1.

- Mas-Colell, Whinston, and Green, 5.A–5.C.

- Jehle and Reny, 3.1–3.2.

○ Dorfman, R., P. A. Samuelson, and R. M. Solow. 1958. *Linear Programing and Economic Analysis.* New York: McGraw-Hill. Chapters 6–7.

[16] **October 12** / Midterm Exam.

October 17 / Fall Break / No Lecture.

October 19 / Fall Break / No Lecture.

[17] **October 24** / Theory of Production 2.

- Mas-Colell, Whinston, and Green, 5.D.

- Jehle and Reny, 3.3–3.5.

- Kreps, 9.1–9.3.

[18] **October 26** / General Equilibrium 1: Discrete Exchange Economies and the Core.

○○ Shapley, L. S., and H. Scarf. 1974. On Cores and Indivisibility. *Journal of Mathematical Economics* 1(1):23–37.

[19] **October 31** / General Equilibrium 2: The Edgeworth Box and Walrasian Equilibrium.

- Mas-Colell, Whinston, and Green, 15.A–15.B.

- Jehle and Reny, 5.1.

- Kreps, 14.1–14.3.

[20] **November 2** / General Equilibrium 3: Walrasian Equilibrium (con't).

[21] **November 7** / General Equilibrium 4: Production and the Robinson Crusoe Economy.

- Mas-Colell, Whinston, and Green, 15.C.

- Jehle and Reny, 5.3.

○○ Defoe, D. 1719. *Robinson Crusoe.*

[**22**] **November 9** / General Equilibrium 5: The Welfare Theorems.

- Mas-Colell, Whinston, and Green, 15.B, 16.A–16.C.

- Jehle and Reny, 5.2.

- Kreps, 15.1–15.3.

[**23**] **November 14** / General Equilibrium 6: The Welfare Theorems (con't).

[**24**] **November 16** / General Equilibrium 7: Existence of Walrasian Equilibrium.

- Mas-Colell, Whinston, and Green, 17.A–17.C.

- Jehle and Reny, 5.1–5.2.

- Kreps, 14.4.

∘∘ McKenzie, L. W. 1954. On Equilibrium in Graham's Model of World Trade and Other Competitive Systems. *Econometrica* 22(2):147–61.

∘∘ Arrow, K. J., and G. Debreu. 1954. Existence of an Equilibrium for a Competitive Economy. *Econometrica* 22(3):265–290.

∘∘ Debreu, G. 1959. *Theory of Value.* New Haven: Yale University Press.

∘ Weintraub, E. R. 2011. Retrospectives: Lionel W. McKenzie and the Proof of the Existence of a Competitive Equilibrium. *Journal of Economic Perspectives* 25(2):199–215.

[**25**] **November 21** / General Equilibrium 8: Uncertainty and Asset Markets.

- Mas-Colell, Whinston, and Green, 19.A–19.E.

- Jehle and Reny, 5.4.

- Kreps, 16.1–16.3.

November 23 / Thanksgiving Holiday / No Lecture.

[**26**] **November 28** / Catch Up / Bonus Lecture.

[27] November 30 / Matching Markets 1: Markets without Transfers.

- ●● Gale, D., and L. S. Shapley. 1962. College Admissions and the Stability of Marriage. *American Mathematical Monthly* 69(1):9–15.

- ○○ Roth, A. E., and M. A. O. Sotomayor. 1990. *Two-Sided Matching: A Study of Game-Theoretic Modeling and Analysis.* Cambridge: Cambridge University Press.

- ○ Roth, A. E. 2015. *Who Gets What—And Why: The New Economics of Matchmaking and Market Design.* New York: Houghton Mifflin Harcourt.

[28] December 5 / Matching Markets 2: Markets with Transfers.

- ●● Shapley, L. S., and M. Shubik. 1971. The Assignment Game I: The Core. *International Journal of Game Theory* 1(1):111–130.

- ○○ Kelso, A. S., Jr., and V. P. Crawford. 1982. Job Matching, Coalition Formation, and Gross Substitutes. *Econometrica* 50(6):1483–1504.

[29] December 7 / Catch Up / Course Wrap Up.

December 13 / Final Exam.

- • The university registrar has provisionally scheduled the final exam for 10:30–12:30 on December 13, 2023. The exam's location will be announced when available.