Overview

This is the first semester in a year-long course in microeconomic theory that serves as an alternative to the microeconomics sequence of Economics 2010a and 2010b. Intended primarily for students who anticipate doing original research employing the tools of microeconomic theory, this doctoral-level course is designed for the dual purposes of giving students a systematic grounding in microeconomics and preparing them to use economic models in their own research. The course sequence addresses the broad methodological topics of consumption theory, production theory, general equilibrium, information economics, and game theory.

Audience

The course is suitable for doctoral students in any field and for advanced public policy students at Harvard Kennedy School. Qualified undergraduates and other professional-school students are welcome with the instructor’s permission. While the topics in this course are mathematical, the emphasis is on economic content rather than proofs and technical details. Nevertheless, mathematical arguments are employed often. Students without a strong background in the areas mentioned below (see prerequisites) will likely be better served by delaying the sequence until they develop the proper background.

Prerequisites

The formal prerequisite for the course is multivariate calculus (typically 3–4 semesters of college-level calculus). It is also helpful to have background in calculus-based probability theory and intermediate microeconomics. Students who do not satisfy the prerequisites may still be able to enroll in the course, but should consult with the instructor before doing so.

1Starting September 1, 2017, lectures will begin at 08.30 (sharp) and end around 09.50.

Date: August 28, 2017.
**Requirements and Grading**

The course requirements include the completion of several problem sets, a midterm exam, and a final exam. Your grades on these tasks will be weighted according to Scheme A and Scheme B. Your final score for the course will be computed according to the most favorable (for you) of the two weightings.

<table>
<thead>
<tr>
<th>Task</th>
<th>Scheme A</th>
<th>Scheme B</th>
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<tbody>
<tr>
<td>Problem Sets</td>
<td>15 %</td>
<td>15 %</td>
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<tr>
<td>Midterm Exam</td>
<td>25 %</td>
<td>0 %</td>
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<tr>
<td>Final Exam</td>
<td>60 %</td>
<td>85 %</td>
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Letter grades will be assigned based on your final weighted score.

**Exams**

The midterm exam will be held in class. The final exam is during the final exam period. All exams are closed-book.

**Problem Sets**

Problem sets are graded primarily for completion and only a “check+/check/check−/no credit” will be offered for feedback. Earning a “check−” or better gives you full credit for the problem set. Sloppy, half-hearted, late, or incomplete work is unlikely to receive full credit. We will drop your lowest problem set grade in calculating your grade for this part of the class.

You are encouraged to work in small groups (four or fewer students) on the problem sets, but you must hand in independently written-up solutions. If you choose to collaborate with others, please identify other group members on your write-up. It will be very difficult to do well on the exams unless you can independently complete problem-set-like questions.

Unless you make prior arrangements, you must submit completed problem sets in hardcopy to the API 111 / Econ 2020a / HBS 4010 assignment dropbox by 12.00 on the due date. The dropbox is located by the second floor mailboxes in the HKS Littauer Building. Do not bring assignments to lecture. Late problem sets will not be accepted. There is no need to type up your problem set solutions, but sloppy work will not receive credit.

**Review Sections**

The teaching fellows will hold weekly review sections. Formally, attendance at these sections is optional. However, most students will benefit greatly from attending one weekly review section.

**Class Time**

Starting on September 1, 2017, lectures will begin at 8.30 (sharp) and end around 9.50. This adjustment is meant to help students reach classes in Harvard Yard, HBS, or elsewhere on time and without a rush.
Course Readings

There will be required readings from the following sources:

- Miscellaneous academic journals.

MWG is the standard textbook used in economics Ph.D. programs. We will also use a set of supplemental notes authored by Nolan Miller. These notes are freely available online. Readings from academic journals can be accessed online through the Harvard Library’s website.

For some lectures there are suggested/optional readings from the following sources:

- *Lecture Notes in Microeconomic Theory* [Rubinstein] by Ariel Rubinstein.
- *Economics and Consumer Behavior* [Deaton and Muellbauer] by Angus Deaton and John Muellbauer.

For a different exposition of the course material and for more exercises, you may wish to consult *A Course in Microeconomic Theory* by David M. Kreps, *Microeconomic Foundations I: Choice and Competitive Markets* by David M. Kreps, or *Microeconomic Analysis* by Hal R. Varian. Students seeking a math supplement may wish to consult *Mathematics for Economists* by Carl P. Simon and Lawrence E. Blum or *Fundamental Methods of Mathematical Economics* by Alpha C. Chaing.

Optional Enrichment Lectures

This course touches many topics and regrettably some subjects cannot be covered in the depth that they ought to be. Some students may benefit from gaining exposure to more advanced topics of particular interest. Thus, the following optional enrichment lectures are planned:

1. Discrete Exchange and Assignment Markets
2. Existence of Walrasian Equilibrium
3. General Equilibrium and Uncertainty

*Optional enrichment lectures are optional.* Any new concepts presented are not exam material. Consult the course calendar for details concerning these lectures.

Audio/Video Recordings

I kindly ask you not to make audio or video recordings of the lectures.
Advice

1. Exam questions will resemble problem set questions. Please seek out practice problems wherever you can. Look beyond the assigned problem sets! Many textbooks have extra exercises. The internet is another resource. The teaching fellows and I are more than happy to help you solve/learn relevant material that you encounter independently.

2. Read the assigned readings before lecture and again after lecture. The excellent notes by Nolan Miller parallel MWG and are less dense. You may wish to read them first.

3. If pressed for time, you are better off practicing problem solving rather than memorizing the details of an assigned text.

4. Please feel welcome to ask questions in class. Illuminating digressions are exciting. However, I may defer your question to a later date or to office hours if it will get us too far off track.

5. 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.

Credits

This course draws on material that I was fortunate to encounter as a student, teaching assistant, and colleague. I am particularly indebted to David Ahn, Bob Anderson, Chris Avery, Ben Hermlin, Shachar Kariv, Botond Kőszegi, Nolan Miller, Matthew Rabin, Martin Rotemberg, and Chris Shannon. I also thank former teaching assistants and students whose input has improved the class.
**Important Dates**

Exams are scheduled for the following dates:

- Midterm Exam: October 2, 2017 [08.30–09.50, in class]
- Final Exam: December 13, 2017 [15.00–18.00, location TBA]

Problem sets are due on the following dates:

<table>
<thead>
<tr>
<th>Problem Set</th>
<th>Date Due</th>
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<tr>
<td>1</td>
<td>September 11</td>
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<tr>
<td>2</td>
<td>September 18</td>
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<td>September 25</td>
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<td>October 16</td>
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<td>October 30</td>
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<td>6</td>
<td>November 13</td>
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<td>7</td>
<td>November 27</td>
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There is a regular lecture scheduled for Friday, September 1, 2017. It will be held at 08.30–9.50 in the regular location.

There are no lectures on the following dates:

- Monday, September 4, 2017 (Labor Day)
- Monday, October 9, 2017 (Columbus Day)
- Wednesday, November 22, 2017 (Thanksgiving Recess)
Course Calendar

The calendar may be adjusted depending on our progress. There are two types of readings. Required readings you should attempt before class and review after class. Optional and supplemental readings may be assigned as the course proceeds to facilitate discussion, illustrate applications, or to provide additional context. Additional readings may be added based on class interest.

Key: ● = required reading. ○ = optional/supplemental/recommended reading.

August 30
Lecture 1. Introduction / Consumer Theory 1: Preferences and Utility

- MWG 1.A–1.B.
- Jehle and Reny 1.1–1.2.
- Miller Chapter 1.
- Rubinstein Lecture 2.
- Deaton and Muellbauer Chapter 1, 2.1–2.2.

September 1
Lecture 2. Consumer Theory 2: Preferences, Utility Maximization, and Walrasian Demand

- Miller 3.1–3.3.
- MWG Appendix M.K (Constrained Optimization).
- Jehle and Reny 1.3–1.4; Appendix A2.
- Rubinstein Lecture 4.

September 4
No Lecture (Labor Day)

September 6
Lecture 3. Consumer Theory 3: Walrasian Demand, Hicksian Demand, and the Slutsky Equation

- MWG 3.D–3.G.
- Miller 3.4.
- Jehle and Reny 1.4–1.5.
- Deaton and Muellbauer 2.3–2.5.

**September 11**
- MWG 3.I.
- Miller 3.4.
- Deaton and Muellbauer 7.4.

**September 13**
Lecture 5. Consumer Theory 5: Revealed Preference
- MWG 2.F & 3.J
- Rubinstein Lectures 3 & 5.
- Jehle and Reny 2.3.
- Deaton and Muellbauer 2.6.

**September 18**
Lecture 6. Uncertainty & Risk 1: Choice Under Uncertainty
- MWG Chapter 6.
- Miller Chapter 6.
- Rubinstein Lectures 7 & 8.
- Jehle and Reny 2.4.
- Deaton and Muellbauer Chapter 14.

**September 20**
Lecture 7. Uncertainty & Risk 2: Utility for Money

- MWG Chapter 6.
- Miller Chapter 6.
- Jehle and Reny 2.4.


**September 25**
Lecture 8. Uncertainty & Risk 3: Applications


**September 27**
Lecture 9. Catch-up / To Be Announced

**October 2**
Midterm Exam

- In class, closed-book exam.
- Covers all preceding lectures.
- No electronics; however, non-graphing and non-programmable calculators are allowed.

**October 4**
Lecture 10. Theory of Production 1: Technology & Profit Maximization

- MWG 5.A–5.C.
- Miller 5.1–5.2.
- Jehle and Reny 3.1–3.2.

**October 9**
No Lecture (Columbus Day)
October 11

- MWG 5.D.
- Miller 5.3–5.5.
  - Jehle and Reny 3.3–3.5.

October 16
Lecture 12. Exchange Economies 1: Discrete Exchange Economies and the Core


- Moulin 3.2.

October 18
Lecture 13. Exchange Economies 2: The Edgeworth Box and Walrasian Equilibrium

- MWG 15.A–15.B.
- Jehle and Reny 5.1.
- Moulin 3.6.
October 20
Optional Enrichment Lecture 1. Discrete Exchange and Assignment Markets
  • Time & Location: 16.15–18.00, Littauer L-332 (Deland Classroom) at the Kennedy School.

October 23
  • MWG 15.A–15.B.

October 25
Lecture 15. Production Economies: The Robinson Crusoe Economy
  • MWG 15.C.
  ◦ Jehle and Reny 5.3.

October 30
Lecture 16. First and Second Welfare Theorems
  ◦ Jehle and Reny 5.2.

November 1
Lecture 17. Externalities and Public Goods 1
  • MWG 11.A–11.C.
  • Miller 8.1–8.3.

November 3
Optional Enrichment Lecture 2. Existence of Walrasian Equilibrium
  ◦ Time & Location: 16.15–18.00, Littauer L-332 (Deland Classroom) at the Kennedy School.
  ◦ MWG 17.A–17.C.
  ◦ Jehle and Reny 5.1–5.2.
November 6
Lecture 18. Externalities and Public Goods 2

November 8
Lecture 19. Two-Sided Markets 1: One-to-one Matching
- Moulin 3.3.

November 13
Lecture 20. Two-Sided Markets 2: Exchange & Quasi-linear Utility
- Moulin 2.2–2.3, 3.4–3.5

November 15
Lecture 21. Two-Sided Markets 3: Many-to-one Matching

November 17
Optional Enrichment Lecture 3. General Equilibrium and Uncertainty
- Time & Location: 16.15–18.00, Littauer L-332 (Deland Classroom) at the Kennedy School.
- MWG 19.A–19.E.
- Jehle and Reny 5.4.

November 20
Lecture 22. Two-Sided Markets 4: Extensions & Applications


**November 22**
No Lecture (Thanksgiving Recess)

**November 27**
Lecture 23. Catch-up / To Be Announced

**November 29**
Lecture 24. Review & Conclusions


**December 13**
Final Exam

• Time & Location: 15.00–18.00 [Location TBA]

• The exam is closed book and covers the entire course.

• Non-graphing and non-programmable calculators are allowed. Other electronics are not allowed.