API 111 Microeconomic Theory

Teaching Team

Instructor: Luis Armona larmona@hks.harvard.edu
TF: Eon Lim ilim@college.harvard.edu
CA: Felix Yueng fyeung@college.harvard.edu

Please include "API 111" in the subject line of all course-related e-mails.

Schedule:
Class Meetings: Tuesdays & Thursdays 1:30pm–2:45pm in (HKS) Littauer 280
Review Sessions: Fridays , 10:30am-11:45am in (HKS) Littauer 130
Instructor Office Hours (OH): Thursday, 3:00PM-4:15PM, in Taubman 452

Eon Lim OH: TBD
Felix Yueng OH: TBD

Overview
API-111 is the first semester in a year-long Ph.D. course in microeconomic theory. 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. It addresses the broad methodological topics of consumption theory, production theory, general equilibrium, industrial organization, information economics, and game theory.

You can leave comments on the course here throughout the semester:
https://forms.gle/XMSGc8LsYdgvJi719

Course Structure
Lectures are Tuesdays and Thursdays from 1:30pm-2:45pm. Most lectures will involve 60m of explaining the course material on microeconomic theory, followed by 15 minutes discussing a paper that puts this theory into practice with data. There will also be a weekly review session that will aid your handling of the material. Classes will be recorded and available on Canvas, though in-person attendance is highly recommended.

The TF, CA, and I will each have hour long office hours each week. Use this opportunity to discuss the class material in a more personalized fashion. If you cannot make any of these, I may be available to hold short appointments with you one and one, as a last resort.

Prerequisites
Formally, one only needs a grasp of multivariate calculus for the course. Familiarity with probability theory, optimization, and linear algebra are extremely helpful. Because mathematical proofs are a core

part of microeconomic theory, and you will be asked to do some as well, familiarity and practice with these types of problems is extremely useful. Otherwise, supplementary knowledge for handling the course material will be handled at the Math Camp.

Course Materials

I will teach primarily "Microeconomic Theory" By Mas-Colell, Whinston, and Green (MWG). This is the canonical textbook used to teach microeconomic theory in Economics Ph.D. programs. Students are required to purchase this textbook.

MWG is, to say the least, rigorous, so I will also include supplementary readings, when available, from Nolan Miller's notes on microeconomic theory (NM) for each lecture, which are somewhat more approachable. These notes are publicly available here: https://nmiller.web.illinois.edu/notes.html . If you are struggling with MWG at times, it might make sense to start with NM and then move on to MWG. All additional supplementary readings will be uploaded onto canvas for download.

On the other hand, you can also use notes prepared by Jon Levin (JL) at Stanford that provide a succinct overview of the microeconomic theory covered in this course, at the PhD level. His notes can be found here: https://web.stanford.edu/~jdlevin/teaching.html
These are very helpful for providing an overview of what each module of the course accomplished while maintaining rigour / not watering things down. I found these to be very helpful during my PhD. However, these notes do not fully cover the entirety of the material covered in the course, so are supplementary (and not substitutable) to the material..

Course Assignments:
The course will be graded based on six problem sets, a midterm, and a final exam.
Course grades will be adjusted based on overall performance, and in line with the grading curve of other HKS courses.

Grade Components:

- Problem Sets (6 total): 10%
- Midterm: 30%
- Final: 60%

We will use the Dean's recommended grade distribution, as seen below:

A	A-	B+	B	B- or lower
15%	25%	35%	20%	5%

Problem Sets

Problem sets will be due on Mondays at 10am, approximately every 2 to 3 weeks. Problem sets *must* be uploaded online to Canvas in PDF form before this time. Grading of problem sets will be done on the basis of a "Check+/Check/Check-/No Credit" system. You are allowed and encouraged to work on these problem sets in groups of no more than four students. However, you must hand in independently written solutions. Please identify all students you worked on the problem set with if you worked in a group. Speaking from personal experience, **Problem sets are the primary way course material is actually learned.** If in a group, I encourage you to try all problems on your own, then meet to discuss the reasoning each group member had for each problem in the assignment. The exam questions, which comprise the vast majority of the grades, will be similar to the problem sets, so excelling on these questions will be the best way to prepare for the exams. The Problem set due dates are below:

- Problem Set 1: 09/16
- Problem Set 2: 09/30
- Problem Set 3: 10/14
- Problem Set 4: 10/28
- Problem Set 5: 11/11
- Problem Set 6: 12/02

Exams

Exams are scheduled for the following dates:

- ˆ Midterm Exam: 1:30pm–2:45pm, October 17th, 2023. Note it is during Lecture time.
- ˆ Final Exam: 2:00–5:00pm, December 12th, 2023. (in person)

Both exams are open book (MWG), and you may bring any handwritten notes or printed supplementary readings, but **no computers are allowed.** In other words, any paper / physical notes are allowed.

Academic Integrity

Students are encouraged to work together and discuss class material and assignments. What is important is the eventual understanding of material achieved, and less about how that is achieved. Any exam, paper or assignment you submit is presumed to be your own original work, so if you do – as you will – use words or ideas written by other people, please make sure to cite these appropriately, and to indicate other students with whom you have collaborated. It is also a violation of the HKS Academic Code to incorporate into your coursework text produced predominantly by generative AI. More information about Harvard's policies on academic integrity may be found in the Student Handbook.

Accessibility and Accommodations for Student Learning

Harvard University values inclusive excellence and providing equal educational opportunities for all students. Our goal is to remove barriers for disabled students related to inaccessible elements of instruction or design in this course. If reasonable accommodations are necessary to provide access,

Please contact the local disability coordinator, Melissa Wojciechowski St. John (melissa_wojciechowski@hks.harvard.edu). She is the Senior Director of Student Services in the HKS Office of Student Services. Accommodations do not alter fundamental requirements of the course and are

not retroactive. Students should request accommodations as early as possible, since they may take time to implement. Students should notify Melissa at any time during the semester if adjustments to their communicated accommodation plan are needed

Date	**Lecture #**	**Topic**	**Required Reading**	**Supplemental Reading**	**Covered Paper**
09/05	1	Intro + Preference Relations	MWG 1 , 3.A-3.B	NM 3.1, JL Choice Theory 1-3	N/A
09/10	2	From Preferences to Choice and Utility	MWG 3.C	NM 3.2, 2.1, 2.2 , JL Choice Theory 4	The Welfare Effects of Misperceived Product Cost https://www.tessexperiments.org/sup/AllcottAEJEP.pdf
09/12	3	Restrictions on Choice Theory	MWG 2.A-2.F	NM 2.3-2.2.7, JL Choice Theory 5	International Comparisons of Living Standards and Tastes: A Revealed- Preference Analysis https://www.jstor.org/stable/2117988
09/17	4	Choice Theory I: Utility Maximization	MWG 3.D	NM 3.3, JL Consumer Theory 1-4	Targeting with In-Kind Transfers: Evidence from Medicaid Home Care https://leelockwood.droppages.com/IK.pdf
09/19	5	Choice Theory II: Expenditure Minimization, Duality	MWG 3.E-3.H	NM 3.4 (up to and including 3.4.6), JL Consumer Theory 5-7	Difference-in-Difference Hedonics https://www.journals.uchicago.edu/doi/abs/10.1086/714442
09/24	6	Welfare Evaluation	MWG 3.I	NM 3.4.7-3.4.8, JL Consumer Theory 8-9	The Digital Welfare of Nations: New Measures of Welfare Gains and Inequality (https://www.nber.org/system/files/working_pape

					rs/w31670/w31670.pdf)
09/26	7	Aggregating Demand	MWG 4	NM 4.1-4.3	Individual Heterogeneity and Average Welfare https://doi.org/10.3982/ECTA11899
10/01	8	Choice Under Uncertainty I: Expected Utility Maximization	MWG 6.A-6.B	NM 6.1, JL Choice under Uncertainty 1-2	Beyond GDP? Welfare across Countries and Time https://www.nber.org/system/files/working_papers/w16352/w16352.pdf
10/03	9	Choice Under Uncertainty II: Risk Preferences	MWG 6.C-6.E	NM 6.2-6.4, JL Choice Under Uncertainty 3-5	A New Method of Estimating Risk Aversion https://www.nber.org/system/files/working_papers/w9988/w9988.pdf
10/08	10	Choice Under Uncertainty III: Beliefs and Bayesian Decision Theory	MWG 6.E-6.F, 19.H (up to and including proposition 19.H.1, p. 718).	MWG 6.C-6.E, JL Choice Under Uncertainty 6-7 Sections 1.1-1.3.3 and 1.4 of Ch. 1, "Axiomatic Foundations of Expected Utility and Subjective Probability" in Economics of Risk and Uncertainty (https://doi.org/10.1016/B978-0-444-53685-3.00001-5)	Social learning and peer effects in consumption: Evidence from movie sales (https://www.nber.org/system/files/working_papers/w13832/w13832.pdf)
10/10	11	Choice Under	Ch. 24 , "The	Blackwell,	Bayesian Persuasion

		Uncertainty IV: The Value of Information	Value of Information", of The Economics of Risk and Time, (https://doi-org.ezp-prod1.hul.harvard.edu/10.7551/mitpress/2622.003.0034)	1965, . "Equivalent Comparisons of Experiments". The Annals of Mathematical Statistics". (https://www.jstor.org/stable/2236332)	https://web.stanford.edu/~gentzkow/research/BayesianPersuasion.pdf
10/15	12	Producer Theory I: Production Technology And Profit Maximization	MWG 5.A, 5.B, 5.C (up to Cost Minimization Section, p. 139) 5.D	NM 5.1, 5.2, 5.5, 5.8, JL Producer Theory 1-3	Estimating Production Functions Using Inputs to Control for Unobservables https://academic.oup.com/restud/article-abstract/70/2/317/1586773
10/17	MIDTERM	Covering Lectures 1-11			
10/22	13	Producer Theory II: Cost Minimization and Aggregation in Production	MWG 5.C (Cost Minimization Section) 5.E-5.G	NM 5.3, 5.4, 5.6, 5.7, 5.9, JL Producer Theory 4-6	De Loecker et al, QJE, "The Rise of Market Power and the Macroeconomic Implications" https://www.nber.org/system/files/working_papers/w23687/w23687.pdf
10/24	14	Producer Theory III: Monopoly and Monopsony, natural monopoly.	MWG 12.A, 12.B, Nonconvex Production Technologies and Marginal Cost Pricing Section of MWG 16.G (p.570-572)		Monopsony in the U.S. Labor Market https://www.aeaweb.org/content/file?id=16972
10/29	15	Producer Theory IV: Price Discrimination	"Ch.10: Price Discrimination " in Volume I		Chang, Yenjae, Clifford Winston, and Jia Yan. "Does Uber Benefit

			of Handbook of Industrial Organization, by Hal Varian (https://www.sciencedirect.com/science/article/abs/pii/S1573448X89010137)		Travelers by Price Discrimination?." The Journal of Law and Economics 65.S2 (2022): S433-S459. https://www.journals.uchicago.edu/doi/pdf/10.1086/721266
10/31	16	Producer Theory IV: Oligopoly Pricing and Firm Conduct	MWG 12.C	Sections 1 and 2 of "Chapter 6: Theories of Oligopoly Behavior" , in Volume I of Handbook of Industrial Organization (Accessible via Harvard University, https://doi.org/10.1016/S1573-448X(89)01009-5)	Backus, Matthew, Christopher Conlon, and Michael Sinkinson. "Common ownership in America: 1980–2017." American Economic Journal: Microeconomics 13.3 (2021): 273-308. https://www.nber.org/system/files/working_papers/w25454/w25454.pdf
11/05	17	Partial Equilibrium I: Competitive Equilibrium	MWG 10.A-10.C	NM 7.1, 7.2,	Equilibrium Effects of Firm Subsidies https://scholar.harvard.edu/files/mrotemberg/files/mrotemberg_equilibrium_effects_of_firm_subsidies.pdf
11/07	18	Partial Equilibrium II: Welfare Theorems	NM 7.3		Chetty, Raj. "Sufficient statistics for welfare analysis: A bridge between structural and reduced-form methods." Annu. Rev. Econ. 1.1 (2009): 451-488. https://doi.org/10.1146/annurev.economics.050708.142910

11/12	19	General Equilibrium I: Exchange Economies	MWG 15.A-15.B	JL GenEq 1-3	Prendergast, Canice. "The allocation of food to food banks." Journal of Political Economy 130.8 (2022): 1993-2017. https://ipl.econ.duke.edu/seminars/system/files/seminars/1491.pdf
11/14	20	General Equilibrium II: Welfare and Pareto Optimality	MWG 16.C-16.E	JL GenEq 4	Pareto-Improving Tax Reforms and the Earned Income Tax Credit https://onlinelibrary.wiley.com/doi/abs/10.3982/ECTA18600
11/19	21	General Equilibrium III: Comparative Statics	MWG 15.C-15.E, ,16.A-16.B, 17.G	JL GenEq 5-7	Guarav Khanna. "Large-Scale Education Reform in General Equilibrium: Regression Discontinuity Evidence from India". Journal of Political Economy, 2023. https://doi.org/10.1086/721619
11/21	22	Externalities and Public Goods	MWG 11.A-11.E		Changes in Social Network Structure in Response to Exposure to Formal Credit Markets https://academic.oup.com/restud/article-abstract/91/3/1331/7208633
11/26	NO CLASS	Early Thanksgiving Recess			

11/28	NO CLASS	Thanksgiving Recess			
12/03	23	General Equilibrium Under Uncertainty I: Arrow-Debreu	MWG 19.A-19.D		Gandhi, Amit, and Ricardo Serrano-Padial. "Does belief heterogeneity explain asset prices: The case of the longshot bias." The Review of Economic Studies 82.1 (2015): 156-186. https://www.serrano-padial.com/uploads/3/9/5/9/39597255/article_restud-final_version.pdf
12/05	24	General Equilibrium Under Uncertainty II: Incomplete Markets and Imperfect Information	MWG 19.E-19.H		Does Income Inequality Lead to Consumption Inequality? Evidence And Theory https://www.nber.org/system/files/working_papers/w9202/w9202.pdf
12/12	FINAL	From 9am to Noon			