Syllabus

This course is the third quarter of the first-year PhD microeconomics sequence. The theme of the course is 'Market Failures and Their Solutions'. Roughly speaking, we will cover Parts III and V of Mas-Colell, Whinston & Green's *Microeconomic Theory* (aka MWG), plus some additional topics not in the text. It is presumed that students have a working knowledge of the topics from the previous two quarters of the sequence, including all of Parts I and IV and most of Part II of MWG. The only required text is MWG (which you should already own), but I will also lecture out of other texts and sources, some of which I list below.

Required Texts:

- *Microeconomic Theory*, by Mas-Colell, Whinston, & Green ("MWG"). This is the bible of microeconomics. It's encyclopedic, but a reference that every economist absolutely must have and know forward and backward. Some chapters read better than others, so picking up an alternative text is a good idea.

Recommended Texts:

- *Advanced Microeconomic Theory* by Jehle & Reny. This book is far easier to read than MWG because it is willing to make stronger assumptions (like strongly monotone, convex preferences, for example) and doesn't worry much about what happens when they are relaxed.

- *Game Theory* by Fudenberg & Tirole, *Game Theory* by Roger Myerson, or *A Course in Game Theory* by Osborne & Rubinstein. These are three good texts in game theory, and each has its strengths and weaknesses. Although we won't stray much beyond the game theory in MWG, any serious student in microeconomics should own (and read) all three of these books.

- *Contract Theory* by Bolton & Dewatripont and *The Theory of Incentives: The Principal-Agent Problem* by Laffont & Martimort. These two books (which are fairly substitutable) explore adverse selection, screening, signalling, and moral hazard in far more detail than MWG.

- *The Handbook of Mathematical Economics*, ed. by Arrow & Itrilligator. Very expensive four-volume set for the math jocks who really want to do theory. The first volume is just a math textbook for economists, and the 2nd book covers the theory of general equilibrium very rigorously. Volume 3 is welfare economics and mechanism design, and volume 4 contains extensions to the basic model that bring the reader more up-to-date.

Office Hours & Contact Information: See chart below.

	T.A.	Professor
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Office Hour 2	Wed. 3:30–4:30	By appointment

Homework & Problem Sets: Worth 30% of your grade.

In this class, "homework" and "problem sets" are two distinct entities.

Homework consists of problems, questions, or proofs that I pose in class that you should work on at home. Homework will not be collected or graded, but is a good way for you to understand the material and prepare for exams.

Problem sets are assigned problems that will be collected and graded. Problem sets will be assigned roughly every two weeks, for a total of (around) five problem sets. If n problem sets are assigned, each will be worth $30/n$ percent of your final grade. The TA will assign a grade from 0 to 10 on each problem set, and I will look through all problem sets to ensure grading accuracy and to gauge your understanding. I will assign problem sets on Tuesdays and they will be collected at the beginning of lecture the following Tuesday. Late problem sets will receive a grade reduction of at least two points (out of ten).

Note two things about problem sets: First, I will only assign a score of 10 to a flawless, thoroughly-solved problem set. Second, if you do not make a reasonable attempt at every problem set, the maximum grade you can earn in the class is a B.

Recitations: Each of you is enrolled in one Friday recitation section, which will be run by the course TA. The recitation will be used (1) to discuss the material or readings assigned for the week, (2) to answer any questions, including questions about problem sets, and (3) to re-explain any especially difficult material from the week's lectures.

Exams: Worth 70% of your grade.

There will be a mid-term exam and a final exam, each worth 35% of your grade. The final exam will focus on material from the second half of the course, but certain questions may require knowledge from the first half. The exams will be given in lieu of a lecture and will take the entire 108 minutes; if you arrive late, you will not be granted additional time. The mid-term is tentatively scheduled for April 26th and the final for May 31st (or during an allotted final exam time slot the following week).

Topics:

- Stability of Equilibrium

- Externalities & Public Goods (MWG Ch. 11)

    - Bilateral externalities & various solutions
    - Public goods & non-optimality of market outcomes

- Market Power (MWG Ch. 12)

  - Monopoly
  - Oligopoly models

- Hidden Information (MWG Ch. 13)

  - Adverse selection
  - Signalling
  - Screening

- Hidden Action (MWG Ch. 14)

  - Moral hazard

- Social Choice Theory (MWG Ch. 21)

  - Social welfare functionals
  - Arrow's Impossibility Theorem
  - Ways around Arrow's Impossibility Theorem

- Mechanism Design & Implementation Introduction (MWG Chs. 21–23)

  - Social choice functions/correspondences
  - Mechanisms and implementation: The Mount-Reiter diagram

- Dominant Strategy Implementation

  - The Gibbard-Satterthwaite Theorem
  - VCG Mechanisms
  - Restricted domains

- Bayesian Implementation

  - The Myerson-Satterthwaite Theorem
  - The d'AGV Mechanism

- Nash Implementation

  - Public goods mechanisms
  - Maskin's Mechanism
  - Implementing via refinements of Nash