Department of Economics

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ECON 808
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Syllabus

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This course is the third quarter of the first-year PhD microeconomics sequence. The theme of the course is 'Market Failures and 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 Text:

- *Microeconomic Theory*, by Mas-Colell, Whinston, & Green ("MWG"). It's encyclopedic, but a reference that every economist absolutely must have and know forward and backward. It's not the best for gaining intuition, however, 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 or *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.

Homework & Problem Sets: Worth 10% 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 $10/n$ percent of your final grade. The grading on each problem set is as follows: If a problem set has T questions, each question $t \in \{1, \ldots, T\}$ will receive a number of points $p_t \in \{0, 1, 2, 3\}$, with 3 reserved for flawless answers and 0 reserved for unattempted (or virtually unattempted) problems. The student's score is then $10 \times \sum_{t=1}^{T} p_t/(3T)$ rounded to the nearest integer, with two exceptions: (1) If $\sum_{t=1}^{T} p_t < 3T$ then the maximum possible score is 9/10, and (2) a student earns 0/10 if and only if they did not turn in their problem set. Thus, perfect scores (10/10) are reserved for flawless problem sets and everyone who turns in a problem set will earn at least 1/10. The TA will grade each problem set and I will look through all problem sets to ensure grading accuracy and to gauge your understanding. Problem sets will be assigned in class and due at the beginning of class exactly one week later (*e.g.*, problem sets assigned in class on Tuesday are due at the beginning of class the following Tuesday). Late problem sets will receive a grade reduction of at least two points (out of ten).

Working on problem sets (and homework) in groups is strongly encouraged, though each individual is expected to turn in their own, unique answers. Using problem sets or their solutions from previous years' classes is expressly forbidden.

Recitations: Each of you is enrolled in one 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 90% of your grade.

There will be a mid-term exam and a final exam. The mid-term exam will be worth 40% of your grade and the final will be worth 50% 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 the fifth week of class and the final will be held during the allotted final exam time slot. Please do not schedule your summer travel plans to conflict with finals week.

Accommodations for Students with Disabilities: It is the intent of the University and these instructors to provide access to support services and programs that enable students with disabilities to succeed in this course. Students with disabilities are responsible for making their needs known to the instructor and seeking available assistance in a timely manner. Students will be referred to the Office for Disability Services (ODS), located in Pomerene Hall, for further assistance (614-292-3307 or visit 150 Pomerene Hall).

Academic Dishonesty: Any and all suspected cases of academic dishonesty will be dealt with according to university procedures. See your student handbook for further information on academic dishonesty and the accompanying procedures and penalties.
See `http://studentaffairs.osu.edu/resource_csc.asp`.

Topics:

- Properties of Walrasian Equilibrium (MWG Ch. 17)
  - Tâtonnemont stability
  - Uniqueness & local uniqueness
  - The core and core convergence
- Externalities & Public Goods (MWG Ch. 11)
  - Bilateral externalities & various solutions
  - Public goods & non-optimality of market outcomes
- Hidden Information (MWG Ch. 13)
  - Adverse selection & unraveling
  - Signalling
  - Screening
- Hidden Action (MWG Ch. 14)
  - Moral hazard
- Social Choice Theory (MWG Ch. 21)
  - Social welfare functionals
  - May's Theorem
  - 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 (expected externality) mechanism
  - The revenue equivalence theorem
  - Optimal Bayesian mechanisms
- Nash Implementation
  - Public goods mechanisms (Groves-Ledyard, Hurwicz, etc.)
  - Maskin's canonical mechanism
  - Implementing via refinements of Nash