The University of Chicago
Economics 30300 - Price Theory
Spring 2019
Tentative syllabus (rev. March 28, 2019)

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Office Hours: By appointment
Class schedule: Tue, Thurs: 2-3:20 PM, 146 Saieh Hall

Course summary: The focus of this course is on strategic settings with uncertainty and incomplete information. Major topics include competitive markets with adverse selection, signaling, moral hazard, nonlinear pricing, strategic and informational incentive constraints, auctions, public goods, bilateral trade and optimal mechanism design.

Assessment: Problem sets (20 percent); midterm exam (35 percent); final exam (45 percent).

Midterm Exam: [To be confirmed: Friday, May 10, 2019 (week 6), during review session time.] Midterm exam will cover all lecture material through Thursday, May 2, 2019 (week 5).

Final Exam: [To be confirmed: Thursday, June 11, 2019, 1:30-3:30] Final exam potentially covers all lecture material, but emphasis will be placed on second half of course.

Problem Sets: I anticipate assigning 8 problem sets during the quarter. In general, the problem sets will be due at the start of the weekly TA review sessions on Friday, *but there is no problem set due at the end of week 1 or in week 6 (midterm week)*. I will try to post the next problem set each Friday afternoon following the TA review session. The problem sets can be completed in groups. Groups may be no larger than 6 people – no exceptions.

Problem set	Posted	Due date	Material covered
PS 1	week 1	4/12 – wk2 rev session	weeks 1-2
PS 2	4/12	4/19 – wk3 rev session	weeks 2-3
PS 3	4/19	4/26 – wk4 rev session	weeks 3-4
PS 4	4/26	5/3 – wk5 rev session	weeks 4-5
midterm - no problem set due			
PS 5	5/3	5/17 – wk7 rev session	weeks 6-7
PS 6	5/17	5/24 – wk8 rev session	weeks 7-8
PS 7	5/24	5/31 – wk9 rev session	weeks 8-9
PS 8	5/31	6/7 – wk10 rev session	weeks 9-10

Teaching assistants: There are three teaching assistants for this course:
Andy Bongjune Choi (andybchoi@uchicago.edu)
Takuma Habu (takumahabu@uchicago.edu)
Sota Ichiba (ichibasota@uchicago.edu)
Among other things, the TA's will conduct review sessions on Fridays, (1:30-2:50pm, Stuart Hall 105). I am sure these TAs will prove to be valuable resources throughout the quarter.

Principal texts:
(JR) Jehle and Reny (2011): *Advanced Microeconomic Theory, 3rd Ed.*

(MWG) Mas Colell, Whinston and Green (1995): *Microeconomic Theory*

Supplementary texts:
great book for corporate finance
(BD) Bolton and Dewatripont (2005): *Contract Theory*
Börgers (2015): *An Introduction to the Theory of Mechanism Design*

Handouts and Canvas: I intend to produce and distribute notes on some topics as we progress through the course, especially for material not covered in the principal texts. These handouts, together with problem sets, will be posted on the course Canvas site.

Topics and Readings: Because this is my first year teaching in the Price Theory sequence, the topics and time allocations listed below should be considered aspirational; I expect the schedule to evolve throughout the quarter. Just in case we finish early, I have listed a set of additional topics for the 10th week, but I expect that we will not have much remaining time. For each topic, the primary readings are from JR and MWG which you should own. I encourage you to also read the indicated chapters from BD and Börgers and the few listed "classic" papers. Throughout the course, I will list additional (and optional) readings on the Canvas site for those that are interested in digging a bit deeper into a topic.

Introduction to course and review of games of incomplete information (Lecture 1)

1. Brief review of Bayes-Nash equilibria (BNE), sequential equilibria (SE), perfect Bayesian equilibria (PBE).
   JR, 7.3
   MWG, 9

I. Adverse selection, Signaling and Screening (with perfect competition) (Lectures 1-4)

1. Adverse selection in competitive markets; no-trade theorem
   JR, 8.1.1
   MWG, 13.A-B

2. Signaling in competitive markets
   JR, 8.1.2
   MWG, 13.C
   BD, 3.1

3. More on signaling: refinements, cheap talk games, signal-jamming games
   MWG, 13.Appendix A
   Cho, Kreps (1987), "Signaling games and stable equilibria," *QJE*.
   Crawford, Sobel (1982), "Strategic information transmission," *Econometrica*.
   Holmström (1999), "Managerial incentive problems - a dynamic perspective," *REStud.*

4. Screening in competitive markets
   JR, 8.1.3
   MWG, 13.D

II. Moral Hazard and Hidden Action (Lectures 5-7)

1. Simple two-action models
   JR, 8.2
   MWG, 14.A-B
   BD, pp 131-148

2. Generalizations; the value of information
   MWG, 14.Appendix A BD, pp 148-157

3. Linear contracts and multitasking (Normal-CARA environment)

4. Applications: Teams; limited liability; (possibly also debt contracts, common agency)
   Innes (1990), "Limited liability and incentive contracting," *JET*.

5. Robust contracts (time permitting)
   Carroll (2015), "Robustness and linear contracts," *AER*.

III. Monopolistic Screening and Hidden Information (Lectures 8-11)

1. General framework: revelation principle, incentive compatibility, optimality
   MWG, 14.D
   Borgers, 2
   BD, 2

2. Monopoly nonlinear pricing
   MWG, 14.D
   Borgers, 2

3. Hybrid models of hidden-information/hidden-action
   MWG, 14.D
   BD, 6.3

4. Extensions: limited liability, random contracts, type-dependent IR, etc.

IV. Bayesian Mechanism Design - Auctions (Lectures 12-14)

1. A variety of auction formats and equilibria
   JR, 9.1-9.2

2. Bayesian incentive compatibility, revenue equivalence, optimal auctions
   JR, 9.3-9.4
   MWG, 23.A-B, 23.D
   Borgers, 3.1-3.2
   Myerson, "Optimal Auction design," *Mathematics of Ops. Res.*, 1981

3. Extensions: common values, correlated private-values, risk aversion

V. Bayesian Mechanism Design - Bilateral trade (Lectures 15-16)

1. Implementable allocations (Bayesian IC and IR) JR, 9.5-9.6
   MWG, 23.D

2. Myerson-Satterthwaite (1983) impossibility theorem and optimal trading mechanisms
   JR, 9.5-9.6
   MWG, 23.E
   Borgers, 3.4
   BD, 7
   Myerson and Satterthwaite, "Efficient mechanisms for bilateral trading," JET, 1983

VI. Implementing Efficient Allocations - Public Goods, etc. (Lectures 17-19)

1. Dominant-strategy incentive compatibility (DSIC)
   JR, 9.5-9.6
   MWG, 23.C
   Borgers, 3.3

2. Vickrey-Clarke-Groves DSIC mechanism; properties
   JR, 9.5-9.6
   MWG, 23.C
   Borgers, 3.3

3. AGV expected-externality BIC mechanism; properties
   JR, 9.5-9.6
   MWG, 23.C
   Borgers, 3.3

4. Property/control rights over allocations; type-dependent IR constraints; public goods impossibility theorem
   JR, 9.5-9.6
   MWG, 23.C
   Borgers, 3.3

Possible additional topics (TBD, time permitting): Information design and Bayesian persuasion, robust mechanism design, mechanism design without transfers, bilateral relational contracts, dynamic screening