Econ 7010: Ph.D. Microeconomics One

Fall 2001

Announcements:
Please check your finals schedule. It is likely that you will wish to reschedule at least one of them. However, for the benefit of both for the faculty involved and your fellow first years, this must be dealt with within the first week.

- Class Time: TuTh 12:30 - 1:45
- Room: Econ 13
- Office Hours: Tu 2-3:30 (or by appointment)
- Office: Economics 14 C (Behind Room 14 in the Economics Basement.)
- Email: roblesj@spot.colorado.edu (Please include 'micro' in subject)
- TA: ?
- Recitation: (As you decided)
- Date of Final: Saturday Dec. 15, 7:30 - 10:00 AM
- Requirements: Midterm 1 (Sept 20th) 20%
  - Midterm 2 (November 15th) 30%
  - Final 50%

Problem Sets

Old Midterms and Finals

Course Outline

Course Description
This is the first semester course in microeconomic theory for a Ph.D. student in economics. We will begin with a mathematical preparation. This will be mostly out of Jehle and Reny's mathematical appendix. However, those desiring a more complete coverage might take a look at Rudin, Principles of Mathematical Analysis, McGraw Hill. In the third edition the most relevant areas are pages: 24-40, 47-58, 8-89 and 94-97.

Last year I used: Sundaram, A first course in optimization theory, Cambridge

The following text comes very strongly recommended: de la Fuente, Mathematical methods and models for economists, Cambridge University press.

We will then spend the remainder of the course studying microeconomic theory. This material is covered in Mas-Colell, Whinston and Green and Jehle and Reny. MWG covers everything, however many people find JR's exposition to be clearer. Most of this time will be spent on the relationship between consumer preference, consumer choice, and consumer demand. What time remains will be spent on the very parallel study of producer output choice.


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Micro Assignments

Math Type Problems Page 1
Math Type Problems Page 2
Page 3 (Optimization)
Please inform me of any typos.
Only the first two problem sets are currently set in stone.

1. Page 1: Problems 1,2,3,5,6,8,10,11
   Due on Sept 4

2. Page 1: Problems 12,13,14,15,16,17
   Page 2: Problems 2,4
   JR Appendix one (i.e. problem 2 is really problem A1.2) Problems: 2,5,7,9,13,30,32,40,49
   Due Sept 18

3. Page 3: Problems 1 to 9
   JR Appendix two, Problems: 12,25,32,33
   Due Oct

   MWG CH1: 1b5, 1c1, 1c2, 1d3.
   MWG CH2: 2d1, 2e1, 2e5, 2f3, 2f7.
   Due Oct

5. MWG Ch 3: 3.b.2, 3.c.2, 3.e.5 (part a only), 3.e.6, 3.d.3 3.d.5
   JR Ch 1: 1.9, 1.12, 1.13, 1.22, 1.24, 1.27, 1.29
   Due Nov

6. MWG 3.d.8, 3.e.3, 3.e.4, 3.e.7, 3.g.4, 3.g.14
   JR 1.30, 1.35, 1.36, 1.43, 1.46, 1.52
   Due Nov

   JR 2.6, 4.17
   MWG 5.B.6, 5.C.3, 5.C.9, 5.D.1
   JR Chapter 3:
   Due Dec

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Course Outline for first half

• Analysis
  1. Metric Spaces
  2. Sequences and Subsequences
  3. Topologies
     ______ Open Sets
     ______ Open Balls
     ______ Closed Sets
     ______ Boundaries and limit points
  4. Maximum, and the minimum vs. the supremum and infimum
  5. Unions and Intersections of open and closed sets
     ______ DeMorgan’s Laws
  6. Compact Sets
     ______ Bounded Sets
     ______ Cauchy Sequences
     ______ Partitions
  7. Convex Sets
     ______ Intersections and Unions
  8. Continuous Functions
     ______ Images and back images

• Optimization in the abstract
  1. Quick basics
     ______ Local maxima and minima
     ______ First order and Second Order Conditions
  2. The existence of a solution: Compactness and continuity
  3. Convex and concave functions
     ______ Graphs and epigraphs
     ______ Quasiconcave and quasiconvex functions
     ______ Level Sets and Upper Contour sets
     ______ Monotonic Transformations
  4. Argmax and Argmin
     ______ Correspondences
     ______ Continuity properties for correspondences
     ______ Theorem of the Maximum

• Optimization in practice
  1. Equality constraints
  2. and the meaning of first order conditions
  3. Positivity constraints
     ______ Comparative slackness
  4. Converting inequality constraints into positivity constraints
  5. THE KUHN-TUCKER THEOREM!!
  6. Some practical aspects of using the KT Theorem

• Declare victory and withdraw

Course Outline for second half

Texts are
MWG - MasCollel Whinston and Green and  
JR - Jehle and Reny

Initially, we will be following the development in MWG, relevant sections of JR are noted. However, when we cover production (MWG 5 and JR 5) I intend to follow the development in JR.

1. Preference and Choice
   - Preference Relations (MWG 1.B, JR 1.2.3, 3.1, 3.2.1)
   - Choice Rules (MWG 1.C)
   - The relationship between Preferences and choice (MWG 1.D)

2. Consumer Choice (MWG ch.2)
   - Commodities and the Competitive Budget (MWG 2.B - 2.D, JR 3.1)
   - Demand Functions and revealed preference (MWG 2.E, 2.F, JR 4.3)

3. Classical Demand Theory (MWG ch.3)
   - From Preference Relation to utility function (MWG 3.B, 3.C, JR 3.2)
   - Utility Maximization (MWG 3.D, JR 2.1.3 3.3, 3.4.1, 3.5.1)
   - Expenditure Minimization (MWG 3.E, JR 2.1.2, 3.4.2)
   - Duality of UMP and EMP (MWG 3.G, JR 3.4.3, 3.5.2)
   - Integrability (MWG 3.H, JR 4.1, 4.2)
   - Welfare Evaluations of Economic Changes (MWG 3.I, JR 6.3.1)
   - The strong axiom of revealed preference (MWG 3.J, JR 4.3)
   - Aggregation (No required reading, but MWG 4 covers this topic)

4. Production (MWG ch.5)
   - Production Sets and Production Functions (MWG 5.B, JR 5.2)
   - Cost Minimization Maximization (MWG 5.C JR 5.3)
   - Profit Maximization (MWG 5.C, 5.D JR 5.5)
   - Efficient Production (MWG 5.F)

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