Announcements:
Please note that the room has been changed to Hellems 245. If you head east (away from the mountains) from the department, and then you will find a large grassy area to your left, and Hellems to your right. We are on the second floor to the right of the stairs at the main entrance.

- Class Time: 12:30 - 1:45
- Room: Hellems 245
- Office Hours: W 2-4 (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: Ming
- Recitation: (As you decided)
- Date of Final: Monday Dec 18 at 1:30 - 4:00 pm
- Requirements: Midterm 1 (Sept 26th) 20%
  Midterm 2 (November 16th) 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.

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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