The Essence of Microeconomic Theory

by

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*The many dozens of comments and suggestions from my students at UCLA and also students at Hong Kong’s University of Science and Technology are gratefully acknowledged.
Every time I dip into the best known of the modern graduate texts in Microeconomics, I marvel at their comprehensiveness. However, there is so much packed into them, that I am not surprised when students report that they find them a bit overwhelming. Rather than attempt to compete by producing yet another Encyclopedia of Microeconomic Theory, I have tried to write a complementary text. My objective in these chapters is to help students develop a sound understanding of the fundamental elements of microeconomic theory and to see how these can be put to productive use. While much use is made of mathematics (algebra, calculus and a modicum of analysis) it is not the mathematics per se which readers will find demanding. Instead the bigger challenges are learning how to express problems in the language of mathematics and then extracting economic insights from the mathematical formulation.

When I first arrived at UCLA as an assistant professor, I was challenged by some “old-Chicago” colleagues to think like an economist. Often this meant being able to think on one’s feet. But it also meant to be able to move confidently back and forth from the language of mathematics to the language of economics. In these chapters a central goal is to develop this “bi-lingual” skill.

I encourage my students to use the notes as a primary text and to use one of the more encyclopedic texts as a reference book. In particular, those students who wish to pursue an academic career in pure theory will benefit greatly by referring to a more formal complementary text. This will be less critical for a student whose interest in theory is to help build a theoretical foundation for applied analysis.

Each chapter has been refined over quite a few years, as I learned from my class what worked and what did not. I have benefited greatly from the many suggestions of first year graduate students at UCLA over the last decade, and also at the Hong Kong University of Science and Technology. In particular, the comments of Park Kichool are gratefully acknowledged.

The book is designed as a text for a first semester graduate level course. At UCLA, I cover much of the material in Chapters 2-7 over period of 10 weeks.
1. **Mathematical Foundations – a review**

   A. Vectors and sets
   B. Linear equation systems and matrices
   C. Quadratic Functions
   D. Curves and surfaces
   E. Concavity and convexity
   F. Separating hyperplanes
   G. Notes on the Exercises

2. **Optimization**

   A. Unconstrained optimization
   B. Constrained optimization - - intuition
   C. The Kuhn-Tucker conditions
   D. The Envelope Theorem
   E. Sufficient Conditions
   F. Notes on the Exercises

3. **Consumers**

   A. Choice
   B. Budget Constrained Choice
   C. Determinants of Demand
   D. Special Preferences
   E. Consumer Surplus
   F. Risky Choices
   G. Notes on the Exercises

4. **Firms**

   A. Production sets and production functions
   B. Production and Cost
   C. Firm supply and demand
   D. Profit function
   E. Long-run v. short-run
   F. Returns to scale
   G. Application: Industry supply with identical firms
   H. Application: Regulation of Monopoly
   I. Application: Joint Costs
   J. Notes on the Exercises
5. **Equilibrium and Efficiency**  
A. The Robinson Crusoe economy  
B. Equilibrium and Efficiency in an exchange economy  
C. First and Second Welfare Theorems  
D. Equilibrium with Constant Returns to Scale.  
E. Notes on the Exercises

6. **Time**  
A. Fisherian two-period model  
B. Spot and Futures prices and Rational Expectations  
C. Life-cycle consumption and savings  
D. A family of optimization problems  
E. Robinson Crusoe Economy  
F. Optimal rate of Investment  
G. Dynamic Programming reformulation  
H. Investment with Price-taking firms  
I. Notes on the Exercises

7. **Uncertainty**  
A. Choice under uncertainty  
B. Changes in beliefs  
C. Market equilibrium  
D. Capital asset pricing model  
E. Notes on the Exercises

8. **Information**  
A. Conceptual distinctions  
B. Hidden actions  
C. Hidden knowledge  
D. Introduction to mechanism design

9. **Mathematical Appendix**  
A. Separating Hyperplanes  
B. Constrained Optimization  
C. Taylor's Expansion  
D. Concave Functions