

Instructor: Ruqu Wang  
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## Course Outline (Fall 2003)

### Economics 7050      Advanced Microeconomic Theory

This course is devoted to game theory and its applications in microeconomic theory. Our focus is on the theoretical aspect of each topic. Therefore, rigorous mathematics will be used extensively. The lectures follow *Microeconomic Theory* by Mas-Colell, Whinston, and Green, as well as some recent papers in microeconomic theory. Not all materials in the selected chapters will be covered in the class, and only those materials discussed in class will be covered in the exams.

The purpose of this course is to provide students with the modern tools of microeconomic theory. These tools are also widely used outside the field of microeconomics. Homework will be assigned regularly and you usually will have seven days to complete them. Working independently on the homework is strongly recommended, as this is the only effective way to prepare you for the exams. On the other hand, study groups discussing course materials (excluding the homework assignments) are encouraged.

Grading:            class participation -- 10%  
                         assignments – 20%  
                         midterm -- 30%  
                         final exam -- 40%

#### Required textbook:

*Microeconomic Theory*, by Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green, Oxford University Press, 1995.

If you have specific disabilities that require accommodation, please let me know early in the semester so that your learning needs may be appropriately met. You will be required to provide documentation of your disability to the Disability Services Office in Willard 322 (telephone: 303-492-8671).

**Midterm Exam: Wednesday, October 15, 2003, in class.**

The following is an approximation of what we are going to discuss in this course. Topics actually covered will depend on students' background and interests.

### **Chapter 7. Game Theory**

- 7.B What is a game
- 7.C The Extensive Form Representation of a Game
- 7.D Strategies and the Normal Form Representation of a Game
- 7.E Randomized Choices

### **Chapter 8. Simultaneous-Move Games**

- 8.B Dominant and Dominated Strategies
  - 8.D Nash Equilibrium
  - 8.E Games of Incomplete Information: Bayesian Nash Equilibrium
  - 8.F Trembling-Hand Perfection
- Handout First-Price, Sealed-Bid Auctions*

### **Chapter 9. Dynamic Games**

- 9.B Sequential Rationality, Backward Induction, and Subgame Perfection
- 9.C Beliefs and Sequential Rationality
- 9.D Reasonable Beliefs and Forward Induction

Appendix A

### **Chapter 10. Competitive Markets**

- 10.B Pareto Optimality and Competitive Equilibria
- 10.C Partial Equilibrium Competitive Analysis
- 10.D The Fundamental Welfare Theorem in a Partial Equilibrium Context
- 10.E Welfare Analysis in the Partial Equilibrium Model
- 10.F Free-Entry and Long-Run Competitive Equilibria

### **Chapter 11. Externalities and Public Goods**

- 11.B A Simple Bilateral Externality
- 11.C Public Goods
- 11.D Multilateral Externalities
- 11.E Private Information and Second-Best Solution

### **Chapter 12. Market Power**

- 12.B Monopoly Pricing
- 12.C Static Models of Oligopoly
- 12.D Repeated Interaction
- 12.E Entry
- 12.F The Competitive Limit
- 12.G Strategic Precommitments to Affect Future Competition

### **Chapter 13. Adverse Selection, Signaling, and Screening**

- 13.B Informational Asymmetries and Adverse Selection
- 13.C Signaling
- 13.D Screening

### **Chapter 14. The Principal-Agent Problem**

- 14.B Hidden Actions (Moral Hazard)
- 14.C Hidden Information (and Monopolistic Screening)

### **Additional Topics (if time allows)**

- Topic 1 Switching Costs in Dynamic Settings
- Topic 2 Auctions and Revenue Comparison