

**Economics 601**  
**Microeconomic Analysis I**

Syllabus  
Fall 2008

**Instructor:** GianCarlo Moschini 583 Heady Hall (294-5761) moschini@iastate.edu

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**Classes:** Lectures Tuesday and Thursday, 9:00 am - 10:50 am 272 Heady Hall

Lab Friday, 3:10 pm - 5:00 pm 272 Heady Hall

(Note: There will be a few schedule changes in first five weeks—details to follow)

**Office hours:** Moschini: Tuesday and Thursday, 11:00 am – 12:00 noon

Cui: Tuesday and Wednesday, 1:00 – 2:00 pm; Thursday, 1:30 – 3:30 pm

**Web page:** <http://www.econ.iastate.edu/classes/econ601/moschini>

### **Course description**

This is the first of two required Ph.D. core theory courses in microeconomics. The objective is to introduce the students to the standard problems of microeconomics, and to develop concepts and skills useful for advanced analysis in all areas of economics. The course will emphasize single-agent optimization problems, including decisions under uncertainty, but will also provide an introduction to aggregation issues and partial equilibrium analysis.

### **Prerequisites**

This course presumes knowledge of intermediate microeconomics, as well as basic mathematical skills suited for graduate work in economics (in particular, students should be proficient on the topics covered in the “Math Camp” offered in the first two weeks of August). The material covered in the first part of Economics 600 is also particularly useful for this course.

**Grades:** 10 % homework (problem sets and lab sessions)  
40 % midterm exam -- Tuesday, October 21, 5:00 pm - 7:00 pm  
50 % final exam -- finals week, date/time TBA

### **Homework**

Problem sets will be assigned each week and posted on the course web page. You are asked to work through all of the problems and to turn in your answers. Answers are due on Fridays, by 12:00 noon, in the T.A.’s mailbox. These problems will be discussed at the Friday lab session. Your assignment work will not be graded—the portion of your grade based on homework will simply depend on your handing in your answers to each question and on your active participation in the Friday lab sessions.

## Required textbook

Mas-Colell A., M.D. Whinston & J.R. Green, *Microeconomic Theory*, Oxford Univ. Press, 1995.

## Recommended textbook

Jehle, G.A., and P.J. Reny, *Advanced Microeconomic Theory*, 2<sup>nd</sup> ed., Addison-Wesley, 2001.

## Other useful books

Graduate microeconomics:

Varian, H., *Microeconomic Analysis*, 3rd edition, Norton, 1992.

Mathematical economics:

Simon, C. & L. Blume, *Mathematics for Economists*, Norton, 1994

Sundaram, R.K., *A First Course in Optimization Theory*, Cambridge University Press, 1996.

Note: These books are available in "Reserve" in the main library.

## DETAILED OUTLINE AND SUGGESTED READINGS

### Part 1: Consumer Theory

**Classical Demand Theory.** Axioms of consumer preferences. Existence of a utility function. Properties of the utility function. The utility maximization problem (UMP): formulation and existence of a solution; necessary and sufficient conditions; interior and corner solutions; unique and multiple solutions. Properties of Marshallian/Walrasian demand functions. Comparative statics: income expansion path and offer curve. Value function and envelope theorems. Indirect utility function: definition and properties. Roy's identity. The expenditure minimization problem (EMP): formulation; existence and characterization of the solution. The expenditure function: definition and properties. Shephard's lemma. Properties of Hicksian demand functions. The compensated law of demand. Relationship between UMP and EMP. Fundamental identities of consumer theory. The Slutsky equation: substitution and income effects. The law of demand.

Mas-Colell, Whinston, and Green (1995), pp. 17-28, pp. 40-63 and pp. 67-75.

Jehle and Reny (2001), pp. 3-60.

Varian (1992), pp. 94-108, p. 113 and pp. 116-123.

**Duality.** Hyperplanes and halfspaces. Separating and supporting hyperplane theorems. Duality results for the expenditure function and the at-least-as-good set. Sufficient conditions for an expenditure function. Recovering the direct utility function from an expenditure function and from an indirect utility function.

Mas-Colell, Whinston, and Green (1995), pp. 63-67 and pp. 76-78.

Jehle and Reny (2001), pp. 69-80.

Varian (1992), pp. 81-87 and pp. 129-131

**Revealed Preferences.** Assumptions. The Weak Axiom (WARP). Implications of WARP: homogeneity and the compensated law of demand. Transitivity and the Strong Axiom (SARP).

Mas-Colell, Whinston, and Green (1995), pp. 28-36 and pp. 91-92.

Jehle and Reny (2001), pp. 86-92.

Varian (1992), pp. 131-137.

**Topics in Demand Theory.** Welfare evaluation of economic change. Equivalent Variation and Compensating Variation. Quasilinear utility. Consumer Surplus. Price indices.\* Deadweight loss of taxation. Endowments in the budget constraint. Leisure demand and labor supply. Homothetic and quasi-homothetic preferences. Separability and aggregation across goods.\* Hicks' composite commodity theorem.\* Aggregation across consumers and market demand functions.

Mas-Colell, Whinston, and Green (1995), pp. 80-91 and pp. 105-108.

Jehle and Reny (2001), pp. 166-170.

Varian (1992), pp. 144-154 and pp. 160-168.

## Part 2: Producer Theory

**Technology.** Production possibility set. Input requirement set. Isoquant. Production function. Transformation function. Regularity and curvature assumptions. Technical rate of substitution. Elasticity of substitution. Returns to scale. Homogeneity and homotheticity.

Mas-Colell, Whinston, and Green (1995), chapter 5 (pp. 127-135).

Jehle and Reny (2001), pp. 117-126.

Varian (1992), chapter 1 (pp. 1-20).

**Profit Maximization and the Profit Function.** The profit maximization problem. Unconstrained optimization applied to  $\Pi$  maximization. FONCs for interior and corner solutions. SOCs and curvature. Input demands and output supply. Properties of demand and supply functions. Comparative statics using FOCs. Definition and properties of the profit function. Hotelling's Lemma and the Envelope Theorem. Properties of input demands and output supply. Comparative statics with the profit function. Efficiency and profit maximization.

Mas-Colell, Whinston, and Green (1995), chapter 5 (pp. 135-139 and 149-152).

Jehle and Reny (2001), pp. 136-141.

Varian (1992), chapter 3 (pp. 23-35 and 40-47).

**Cost Minimization and the Cost Function.** Constrained optimization and the cost minimization problem. FONCs for interior and corner solutions. SOCs and curvature. Conditional factor demands. Comparative statics. Definition and properties of the cost function. Shephard's lemma and the envelope theorem. Comparative statics with the cost function. Cost function and output. Marginal cost and average cost. Returns to scale. Homotheticity and homogeneity. Profit maximization with the cost function. Fixed costs, variable costs, and sunk costs. Long-run and short-run. The Le Chatelier principle.\* Review of duality and parallels with consumer theory. Geometry of duality: isoquants, isocosts, and factor demands.

Mas-Colell, Whinston, and Green (1995), chapter 5 (pp. 139-147)

Jehle and Reny (2001), pp. 126-135.

Varian (1992), chapter 4 (pp. 49-61, 63-77, pp. 81-93)

### Part 3: Partial Equilibrium

**Competitive Markets.** Features of perfect competition. Definition of equilibrium and partial equilibrium. Industry supply functions in the short run. Industry (market) demand function. Equilibrium in the short run, existence and uniqueness. Welfare analysis in partial equilibrium. Demand with quasilinear utility and Marshallian surplus. Pareto efficiency. First and second welfare theorems in a partial equilibrium context. Welfare effects of taxation. Free entry and long-run equilibrium.

Mas-Colell, Whinston, and Green (1995), chapter 10.

Varian (1992), chapter 13.

**Monopoly.** The monopolist's profit maximization problem. Comparative statics of a cost change. Welfare effects of a monopoly; comparison with competitive equilibrium. Regulating a monopoly: price ceilings and taxes/subsidies. First-degree (perfect) price discrimination. Second-degree price discrimination (nonlinear pricing).<sup>\*</sup> Third-degree (multimarket) price discrimination.

Mas-Colell, Whinston, and Green (1995), chapter 12 (pp. 383-387).

Varian (1992), chapter 14.

### Part 4: Uncertainty and Risk Aversion

**Elements of Choice under Uncertainty.** Lotteries. Preferences over lotteries. The Independence Axiom and the Expected Utility (EU) theorem. The Allais paradox. EU representations for continuous random variables. Risk aversion: Jensen's inequality and concavity of the Bernoulli utility function. Certainty equivalent and the risk premium. The Arrow-Pratt coefficient of absolute risk aversion. The coefficient or relative risk aversion.

Mas-Colell, Whinston, and Green (1995), chapter 6 (pp. 167-194).

**Selected Applications.** A simple insurance model. A simple portfolio model. Comparative statics in the simple portfolio model: the effects of initial wealth and risk attitudes (decreasing absolute risk aversion; decreasing relative risk aversion). The theory of the firm under price uncertainty.<sup>\*</sup> Quadratic, CARA, and CRRA utility functions. CARA utility and the linear mean-variance model.<sup>\*</sup> Comparison of payoff distributions and stochastic dominance.<sup>\*</sup>

Mas-Colell, Whinston, and Green (1995), chapter 6 (pp. 187-199).

Note: topics labeled with the \* symbol will be covered explicitly if time allows.