ECONOMICS 100B: MICROECONOMICS

Winter 2010 **Tuesday, Thursday 11:00am-12:20pm** **Center Hall 212**

Professor Mark Machina **Office: 217 Econ Bldg.** **Office Hours: Wed 8-noon**

TA's: Tim Keller	140 Sequoyah Hall	Th 8:00-10:30am
Matt Niedzwiecki	123 Econ Bldg.	Mon 1:00-3:00pm
Section 1	Monday 7:00-7:50pm	CSB 002
Section 2	Monday 8:00-8:50pm	CSB 002

DATE	TOPIC	CHAPTER IN TEXT
Jan. 5	Introduction & Mathematical Review	
Jan. 7	Theory of Production	Ch. 6
Jan. 12	Theory of Production (continued)	Ch. 6
Jan. 14	Theory of Production (continued)	Ch. 6
Jan. 19	Theory of Cost	Ch. 7
Jan. 21	Theory of Cost (continued)	Ch. 7
Jan. 26	Theory of Cost (continued)	Ch. 7
Jan. 28	**(Thursday) 1st Midterm Exam**	
Feb. 2	Profit Maximization and Supply under Perfect Competition	Ch. 8
Feb. 4	Profit Maximization and Supply under Perfect Competition (continued)	Ch. 8
Feb. 9	Profit Maximization and Supply under Perfect Competition (continued)	Ch. 8
Feb. 11	Demand for Factors of Production	Ch. 15
Feb. 16	Demand for Factors of Production (continued)	Ch. 15
Feb. 18	Equilibrium, Dynamics & Comparative Statics of Perf. Comp. Markets	Ch. 2
Feb. 23	Equilibrium, Dynamics & Comparative Statics of Perf. Comp. Markets (cont.)	Ch. 9
Feb. 25	**(Thursday) 2nd Midterm Exam**	
Mar. 2	Efficiency of a Perfectly Competitive Market	Ch. 10
Mar. 4	General Equilibrium	Ch. 10
Mar. 9	Efficiency of Perfectly Competitive Market System	Ch. 10
Mar. 11	Conclusion & Overview	
Mar. 18	**(Thursday) FINAL EXAM 11:30am-2:30pm (location T.B.A)**	

TEXT & READINGS: *Microeconomics: Theory and Applications with Calculus* (1st Ed.) by Jeffrey Perloff, Addison-Wesley, 2008. There is also a Soft Reserve Package which contains the Math Handout, practice problems, and old exam questions. You are responsible for all the material in the assigned portions of the text and the Math Handout.

EXAMS: Grades are determined on the basis of two Midterm Exams and a Final Exam.

COURSE WEB PAGE: The course web page is at:

Course Web Page: http://econ.ucsd.edu/~mmachina/courses/ECON_100B/ECON_100B.html

ECON 100B COURSE OUTLINE

I. MATHEMATICAL REVIEW

- **a. Comparative Statics of Solution Functions (Math Handout, Section F)**
- **b. Comparative Statics of Equilibria (Math Handout, Section G)**
- **c. Comparative Statics of Optimal Value Functions (Math Handout, Section H)**

II. THEORY OF PRODUCTION

- **a. Production Functions**
  - Types of factors and their income
  - Examples: Linear, Leontief, Cobb-Douglas
  - Total Product Curves
- **b. Marginal Products and the Law of (eventually) Diminishing Marginal Product**
  - Definition of Marginal Product and Algebraic Examples
  - Marginal product curves (Linear, Leontief, Cobb-Douglas)
  - Hypothesis of diminishing marginal product of a factor
- **c. Average Products and the Average-Marginal Relationship**
  - Definition of average product
  - Average product curves (Linear, Leontief, Cobb-Douglas)
  - Proof of Average-Marginal relationship
- **d. Isoquants and Marginal Rate of Technical Transformation (MRTS)**
  - Definition and general properties of isoquants
    - Examples: Linear, Leontief, Cobb-Douglas
  - Definition of MRTS
    - Expressing MRTS in terms of marginal products
    - Examples: Linear, Leontief, Cobb-Douglas
  - Hypothesis of diminishing MRTS
- **e. Returns to scale**
- **f. Technical Progress**

III. THEORY OF COST:

- **a. The Nature of Cost**
  - Accounting vs. opportunity cost of owned factors
  - Cost of entrepreneurial ability and definition of "Economic Profits"
  - Short run vs. Long run planning
- **b. Short Run Cost Functions**
  - Expansion path in short run
  - Graphical derivation of SR total cost curve
  - Algebraic derivation of SR total cost curve (Linear, Leontief, Cobb-Douglas)
  - SR variable fixed and marginal cost functions
  - Relation of SMC to marginal product of input and the price of input
- **c. Long Run Cost Minimization**
  - Isocost lines
  - Graphical illustration of LR cost min
  - FOC for long run cost min
  - Second order conditions (Hypothesis of Dimishing MRTS)
  - Output constrained factor demands

d. Long Run Cost Functions

e. Relationship between Long Run and Short Run Cost Curves
Long and short run total cost curves
Long and short run average cost curves
Long and short run marginal cost curves

IV. PROFIT MAXIMIZATION AND SUPPLY UNDER PERFECT COMPETITION

a. Long Run Profit Maximization and Supply under Perfect Competition
Graphical illustration and algebraic formulation of LR profit max
FOC, SOC and interpretation
Graphical illustration and algebraic formulation of LR supply curve
Examples: Cobb Douglas, Cubic LTC, CRS
Properties of LR supply (increasing in output P, decreasing in w,r, scale invariant in P,w,r)
Long run elasticity of supply

b. Short Run Profit Maximization and Supply under Perfect Competition
SR profit max and shut-down decision (illustration in terms of STC & SVC, and SATC & SAVC)
SR supply curve of the firm
SR supply function of the firm (Examples: Cobb Douglas, Cubic STC)
Properties of SR supply functions (increasing in output price, nonincreasing in factorprices, scale invariant in factor and output prices)
SR market supply

c. Transactions Costs and Internal Production

V. DEMAND FOR FACTORS OF PRODUCTION

a. Maximizing Profits by Choosing Optimal Input Levels

b. Short Run Factor Demand

c. Long Run Factor Demand

d. Incentive Aspects of Alternative Compensation Schemes.

VI. EQUILIBRIUM, DYNAMICS, AND COMPARATIVE STATICS OF PERFECTLY COMPETITIVE MARKETS

a. Assumptions of Perfect Competition and "Law of One Price"

b. Equilibrium in Perfectly Competitive Markets

c. Dynamics of Market Adjustment

d. Comparative Statics of Perfectly Competitive Markets

VII. EFFICIENCY OF A PERFECTLY COMPETITIVE MARKET

VIII. GENERAL EQUILIBRIUM

IX. EFFICIENCY OF A PERFECTLY COMPETITIVE MARKET SYSTEM

a. Pareto Efficiency

b. Edgeworth Boxes

c. Efficiency of Perfectly Competitive Equilibrium

FAMOUS OPTIMIZATION PROBLEMS IN ECONOMICS

Optimization Problem	Objective Function	Constraint	Control Variables	Parameters	Solution Functions	Optimal Value Function
Consumer's Problem	$U(x_1,...,x_n)$ utility function	$p_1 \cdot x_1 + ... + p_n \cdot x_n = I$ budget constraint	$x_1,...,x_n$ commodity levels	$p_1,...,p_n, I$ prices and income	$x_i(p_1,...,p_n,I)$ regular demand functions	$V(p_1,...,p_n,I)$ indirect utility function
Expenditure Minimization Problem	$p_1 \cdot x_1 + ... + p_n \cdot x_n$ expenditure level	$U(x_1,...,x_n) = \overline{u}$ desired utility level	$x_1,...,x_n$ commodity levels	$p_1,...,p_n, \overline{u}$ prices and utility level	$h_i(p_1,...,p_n, \overline{u})$ compensated demand functions	$e(p_1,...,p_n, \overline{u})$ expenditure function
Labor/Leisure Decision	$U(H,I)$ utility function	$I = I_0 + w \cdot (168 - H)$ budget constraint	H, I leisure time, disposable inc.	w, I_0 wage rate and nonwage income	$168 - H(w, I_0)$ labor supply function	$V(w, I_0)$ indirect utility function
Consumption/ Savings Decision	$U(c_1,c_2)$ utility function	$c_2 = I_2 + (1+i) \cdot (I_1 - c_1)$ budget constraint	c_1, c_2 consumption levels	I_1, I_2, i income stream and interest rate	$c_1(I_1, I_2, i)$, $c_2(I_1, I_2, i)$ consumption functions	$V(I_1, I_2, i)$ indirect utility function
Long Run Cost Minimization	$w \cdot L + r \cdot K$ total cost	$F(L,K) = Q$ desired output	L, K factor levels	Q, w, r desired output and factor prices	$L(Q,w,r)$, $K(Q,w,r)$ output-constrained factor demand functions	$LTC(Q,w,r)$ long run total cost function
Long Run Profit Maximization (in terms of Q)	$P \cdot Q - LTC(Q,w,r)$ total profit	none	Q output level	P, w, r output price and factor prices	$Q(P,w,r)$ long run supply function	$\pi(P,w,r)$ long run profit function
Long Run Profit Maximization (in terms of L and K)	$P \cdot F(L,K) - w \cdot L - r \cdot K$ total profit	none	L, K factor levels	P, w, r output price and factor prices	$L(P,w,r)$, $K(P,w,r)$ factor demand functions	$\pi(P,w,r)$ long run profit function