ECONOMICS 100A: MICROECONOMICS

Fall 2013	**Tues, Thur 2:00-3:20pm**	**Center Hall 101**
Professor Mark Machina	**Office: Econ Bldg 217**	**Office Hrs: Wed 9am-1pm**

(See other side for Section times & locations, and TA's offices & office hours)

DATE	TOPIC	TEXT CHAPTER/ MATH HANDOUT SECTION
Sep. 26	Introduction & Mathematical Review #1	Ch.1, 2.1, 2.5 / Sects. A, B
Oct. 1	Mathematical Review #1 (cont.)	Sect. C
Oct. 3	Consumer Preferences: Utility Functions and Indifference Curves	Ch. 3.1, 3.2
Oct. 8	Consumer Preferences: Utility Functions and Indifference Curves (cont.)	"
Oct. 10	Mathematical Review #2	Sects. D, E
Oct. 15	Mathematical Review #2 (cont.)	"
Oct. 17	Utility Maximization and Demand Functions	Ch. 3.3, 3.4, 4.1
Oct. 22	**(Tuesday) 1st Midterm Exam**	
Oct. 24	Utility Maximization and Demand Functions (cont.)	"
Oct. 29	Utility Maximization and Demand Functions (cont.)	"
Oct. 31	Comparative Statics of Demand	Ch. 4.2, 4.3
Nov. 5	Comparative Statics of Demand (cont.)	"
Nov. 7	Comparative Statics of Demand (cont.)	"
Nov. 12	Comparative Statics of Demand (cont.)	"
Nov. 14	**(Thursday) 2nd Midterm Exam**	
Nov. 19	Supply of Labor: The Labor-Leisure Decision	Ch. 5.5
Nov. 21	Supply of Capital: Consumption-Saving Decision	
Nov. 26	Supply of Capital: Consumption-Saving (cont.)	
Dec. 3	Decision Making under Risk and Uncertainty (cont.)	Ch. 16.1, 16.2
Dec. 5	Decision Making under Risk and Uncertainty (cont.)	"
	FINAL EXAM (Thursday, Dec. 12, 3:00-6:00pm)	**(location TBA)**

TEXT & READINGS: *Microeconomics: Theory and Applications*, Third Custom Edition for UCSD, by Jeffrey Perloff, Addison Wesley, 2014. There is also a Soft Reserve Package which contains the Math Handout, practice problems, and old exam questions. Although we will go over some of these questions in office hours and review sessions, the best way to prepare for the exam is to form study groups and practice doing them together.

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

COURSE WEB PAGE: The course web page is at:

www.econ.ucsd.edu/~mmachina/courses/ECON_100A/ECON_100A.html

ECON 100A FALL 2013 SECTION TIMES, TAS' OFFICES & OFFICE HOURS

Section	Day, Time	Room	TA	Office & Office Hours
C01	Mon 4:00-4:50pm	Pepper Canyon Hall 122	Onyi Lam	Sequoyah Hall 235 Thursday 4-6pm
C02	Wed 6:00-6:50pm	Cognitive Sciences Bldg. 102	Vincent Leah-Martin	Economics Bldg. 124 Monday 5-7pm
C03	Tues 7:00-7:50pm	Center Hall 109	Vincent Leah-Martin	Economics Bldg. 124 Monday 5-7pm

ECON 100A COURSE OUTLINE – Fall 2013

I. INTRODUCTION

a. Domain of Microeconomic Analysis

b. Circular Flow Diagram

c. Stocks vs. Flows and the Dimensions of Economic Variables

II. MATHEMATICAL REVIEW #1

a. Calculus Review (Math Handout, Section A)

Derivatives, Partial Derivatives and the Chain Rule
Approximation Formulas for Small Changes in Functions (Total Differentials)

b. Elasticity (Math Handout, Section B)

Absolute, Proportionate and Percentage Changes in Variables
Definition of Elasticity
Constant Elasticity Functions

c. Level Curves of Functions (Math Handout, Section C)

Definition and Graphical Illustration
Algebraic Formula for a Level Curve
Formula for the Slope of a Level Curve

III. CONSUMER PREFERENCES: UTILITY FUNCTIONS & INDIFFERENCE CURVES

a. Commodities, Commodity Bundles and Preferences

Commodities are Typically *Flows*, not *Stocks*
Issue of Divisibility
The Relevant Time Period

b. Preference Relations and Utility Functions

Preferences are defined over Commodity Bundles, *not* Individual Commodities
Weak Preference, Strict Preference and Indifference
Utility Functions and Total Utility Curves
- Important Examples: Linear, Cobb-Douglas, Leontief

Marginal Utility and Marginal Utility Curves
- Hypothesis of Diminishing Marginal Utility

Monotonic Transformations of Utility Functions

c. Indifference Curves and the Marginal Rate of Substitution

Deriving a Consumer's Indifference Curves from Their Utility Function
General Properties of Indifference Curves:
- One Through Every Commodity Bundle
- Downward Sloping and Can't Cross

Marginal Rate of Substitution (MRS)
- Graphical Interpretation: Slope of the Indifference Curve
- Algebraic Formula: Ratio of Marginal Utilities
- Hypothesis of Diminishing Marginal Rate of Substitution

IV. MATHEMATICAL REVIEW #2

a. Scale Properties of Functions (Math Handout, Section D)

b. Solving Optimization Problems (Math Handout, Section E)

General Structure of Optimization Problems
First and Second Order Conditions for Unconstrained Optimization Problems
First Order Conditions for Constrained Optimization Problems

c. Inequality Constraints and Corner Solutions

V. UTILITY MAXIMIZATION AND DEMAND FUNCTIONS

a. Utility Maximization Subject to a Budget Constraint

- Graphical Illustration
- First Order Conditions for Utility Maximization
  - Two Interpretations of the First Order Conditions
- Second Order Conditions (Hypothesis of Diminishing MRS)
- Corner Solutions: Graphical Illustration and Algebraic Condition
- Indirect Utility Functions and their Properties

b. Regular ("Marshallian") Demand Curves and Demand Functions

- Plotting Regular Demand Curves
- Regular Demand Functions
- General Properties of Demand Functions:
  - Walras' Law
  - Scale Invariant in Prices and Income
  - Relationship between Price Elasticities & Income Elasticity for a Good
- Examples: Cobb-Douglas, Leontief, Linear
- Market Demand Functions

VI. COMPARATIVE STATICS OF DEMAND

a. Income Changes

- Income-Consumption Locus
- Engel Curves: Definition and Graphical Derivation
- Income Elasticity
  - Superior, Normal and Inferior Goods
  - Income Elasticity and Budget Shares
  - Relationship Between Income Elasticities of All Goods
- Algebraic Derivation of the Effect of an Income Change

b. Price Changes

- Price-Consumption Locus
- Graphical Derivation of Marshallian Demand Curves
- Own Price Elasticity
  - Price Elasticity and Expenditures
- Cross Price Elasticity
  - Gross Substitutes and Gross Complements
- Algebraic Derivation of the Effect of a Price Change

c. Compensated Price Changes and Compensated ("Hicksian") Demand Functions

- Graphical Illustration of a Compensated Price Change
- The Expenditure Minimization Problem
- Compensated Demand Functions and their Properties
- Expenditure Functions and their Properties
- Algebraic Derivation of the Effect of a Compensated Price Change

d. The Slutsky Equation

- Expressing Each of the Three Basic Changes in Terms of the Other Two
- Graphical Illustration
- Algebraic Formulation and Informal Proof
- Giffen Goods

e. Consumer Surplus and Welfare Analysis

- Consumer Surplus
- Equivalent and Compensating Variation

VII. SUPPLY OF LABOR: THE LABOR-LEISURE DECISION

Income-Leisure Space and the Labor-Leisure Decision
First Order Conditions for Optimal Supply of Labor
Comparative Statics: Income and Substitution Effects
Backward Bending Supply of Labor Curves
Kinked Budget Lines and the Overtime Decision

VIII. SUPPLY OF CAPITAL: THE CONSUMPTION-SAVINGS DECISION

Intertemporal Income and Consumption Streams
Interest Rates and Discounted Present Value of a Stream
Intertemporal Utility Maximization
- First Order Conditions and Interpretation

Comparative Statics: Income and Substitution Effects

IX. DECISION MAKING UNDER RISK AND UNCERTAINTY

a. Outcomes, Lotteries and Expected Value

Choice over Lotteries
Expected Value
The St. Petersburg Paradox

b. Expected Utility

Two-Stage Lotteries and the Independence Axiom
von Neumann-Morgenstern Utility Functions and Expected Utility

c. Risk Aversion

Properties of Risk Averse Preferences
Arrow-Pratt Measure of Risk Aversion
Risk Aversion and Wealth

d. Measures of Risk Aversion

e. Demand for Insurance

f. Investment in a Risky Asset

FAMOUS OPTIMIZATION PROBLEMS IN ECONOMICS

Optimization Problem	Objective Function	Constraint	Control Variables	Parameters	Solution Functions	Optimal Value Function
Consumer's Problem	$U(x_1,\ldots,x_n)$ utility function	$p_1\cdot x_1+\ldots+p_n\cdot x_n = I$ budget constraint	$x_1,\ldots,x_n$ commodity levels	$p_1,\ldots,p_n, I$ prices and income	$x_i(p_1,\ldots,p_n,I)$ regular demand functions	$V(p_1,\ldots,p_n,I)$ indirect utility function
Expenditure Minimization Problem	$p_1\cdot x_1+\ldots+p_n\cdot x_n$ expenditure level	$U(x_1,\ldots,x_n) = u$ desired utility level	$x_1,\ldots,x_n$ commodity levels	$p_1,\ldots,p_n\,, u$ prices and utility level	$h_i(p_1,\ldots,p_n\,, u\,)$ compensated demand functions	$e(p_1,\ldots,p_n\,, u\,)$ 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