

# ECONOMICS 100A: MICROECONOMICS

Spring 2011

Tuesday, Thursday 8:00-9:20 am in PETER 110

## Instructor:

Dr. Melissa Famulari      mfamulari@ucsd.edu      Office: Econ 221      Hours: Wed. 11:00a-2:00p

## Graduate Teaching Assistants:

(1) Elisa Hovander	<a href="mailto:ehovande@ucsd.edu">ehovande@ucsd.edu</a>	Office : Econ 125	Hours: Wed. 5-7p
(2) Danielkin Molina	<a href="mailto:dmolina@ucsd.edu">dmolina@ucsd.edu</a>	Office: Seq Hall 140	Hours: Monday, 4-6:00p
(3) Charles Sprenger	<a href="mailto:cprenge@ucsd.edu">cprenge@ucsd.edu</a>	Office: Seq Hall 207	Hours: Monday 10:00a-1:00p

## Undergraduate Teaching Assistants:

(1) Christopher Fan	<a href="mailto:cfan@ucsd.edu">cfan@ucsd.edu</a>	Office: Seq Hall 139	Hours: Wed. 3-5:00p
(2) Frances Jiang	<a href="mailto:frjiang@ucsd.edu">frjiang@ucsd.edu</a>	Office: Seq Hall 139	Hours: Friday, 2-4:00p

*Prerequisites:* Econ 1 and either Math 10C or Math 20C or Math 21C.

*Assessment:* There are two inclass midterm exams, **Thursday, April 14** and **Thursday, May 12**, each of which is worth 22.5% of your grade. Homework accounts for 10% of your grade. The final exam is cumulative and is worth 45% of your grade. The date of the final is **Thursday, June 9 from 8:00a-11:00a**.

*Course Objectives:* As the first class in the micro sequence, Econ 100A is designed to teach you how to set up, solve and analyze optimization models and apply these mathematical models to the theory of the consumer (commodity demand, labor supply and consumption/savings decisions). Finally, we will examine the fundamentals of decision making under risk and uncertainty.

## Course Materials:

### Required Textbook and Reading:

- (1) Perloff, Jeffrey M. (2007) *Microeconomics: Theory and Applications with Calculus*, Pearson/Addison-Wesley.
- (2) Machina, Mark (2010) "Math Handout"

### Additional Readings:

Other calculus-based intermediate textbooks that you could use to supplement Perloff include Walter Nicholson's, *Microeconomic Theory*, Hal R. Varian's, *Intermediate Microeconomics* and Binger and Hoffman's, *Microeconomics with Calculus*.

One free option is an online introductory textbook written by Preston McAfee of Caltech <http://www.introecon.com/>. The level of this book is between Econ 1 and Econ 100A. It is very interesting, free, and you may find it useful

*Mathematics Tutorial for Economists:* Written by Martin Osborne at the University of Toronto

<http://www.economics.utoronto.ca/osborne/MathTutorial/index.html>, Chapters 1-6 of this will help you review the material that you learned in Math 10ABC or 20ABC that are the most important for this course.

*Mandatory Discussion Sessions:* These mandatory sessions are conducted by your TAs who will answer your questions regarding lectures, the textbook, practice problems and old exam problems.

*WebCT:* This is where you access the syllabus, class handouts, a discussion board, your grades, homework assignments, etc. I have also posted my old 100A exams to give you some additional practice. NOTE: Though I will not post answers to the old exams, you may find them a useful study tool.

*Weekly Homework:* There will be 7 homework assignments. I will post homework assignments on WebCT each Friday. On the following Thursday I will flip a coin in class. If it comes up heads, I will collect and grade the homework on a 0, 1 (serious effort on some problems), 2 (serious effort on all problems) scale. Performance on the graded homework will count for 10% of your grade.

***Administrative Issues:***

- (1) If you have a documented disability, please bring your documentation to me as soon as possible so that I can make suitable accommodations for you. If you believe that you have a disability and desire accommodation, please register with the Office for Students with Disabilities
- (2) Any student found guilty of academic dishonesty will earn a failing grade for the course. In addition to my academic sanction, the Council of Deans of Student Affairs will also impose a disciplinary penalty.
- (3) EXAMS
  - a. You must bring your student ID to all exams.
  - b. You may only use a pen/pencil and a straight edge during exams.
    - i. Exams are closed book and you may not use any notes.
    - ii. Exams are electronic-free: you may not use calculators, headphones, cell phones, etc. during an exam
  - c. If you arrive late to an exam, I will allow you to take the exam in the time that remains *as long as no one has turned in his/ her exam and left the room*. Once a classmate has turned in his/her exam, you will earn a zero on the test if you arrive late.
  - d. There are no bathroom breaks during midterm exams.
  - e. If there is a mistake adding the points on your exam, bring it to my attention within one week of the exam being returned and I will correct it.
  - f. If you believe your exam has not been graded properly, you may request a regrade within one week of the exam being returned. I will regrade your entire exam. The regraded score will be your grade for the exam. You may not ask for another regrade or go back to your first grade.

Week	Text, Math Handout	Topic
(1) 3/29	Chapter 1 & 2 Calculus Appendix, A.1-A.3 Chapter 3: 60-74	I. Introduction  II. Consumer Preferences: A. Axioms of Rational Choice B. Utility Functions C. Level curves of utility function: Indifference Curves D. Marginal Rate of Substitution
(2) 4/5	Chapter 3: 74-75, Calculus Appendix, A.4-A.6 Machina Handout	III. Common Utility Functions: Cobb-Douglas, Perfect Complements (Leontief), Perfect Substitutes, CES  IV. The Budget Constraint  V. Mathematical Review of Optimization
(3) 4/12	Chapter 3: 75-89	VI. Utility Maximization and Demand Functions  <b>Midterm 1: Thursday, April 14</b>
(4) 4/19	Chapter 4: 93-110	VII. Comparative Statics of Demand A. Income changes B. Price changes (income and substitution effects)
(5) 4/26	Chapter 4: 111-126	VII. Comparative Statics of Demand (continued) C. Compensated price changes and compensated demand functions. D. Slutsky Equation
(6) 5/3	Chapter 5: 130-152	E. Demand Relationships among goods F. Measures of Consumer Welfare
(7) 5/10	Chapter 5: 152-164	VIII. Supply of Labor: The Labor-Leisure Decision  <b>Midterm 2: Thursday, May 12</b>
(8) 5/17		VIII. Supply of Labor: The Labor-Leisure Decision (continued)  IX. Supply of Saving: The Consumption-Savings Decision
(9) 5/24	Chapter 16	X. Decision Making under Risk and Uncertainty
(10) 5/31		X. Decision Making under Risk and Uncertainty (continued)

**Thursday, June 9 from 8:00a-11:00a.**

# ECON 100A COURSE OUTLINE – Spring 2011

## I. INTRODUCTION

**Domain of Microeconomic Analysis**

**Circular Flow Diagram**

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

## II. CONSUMER PREFERENCES: UTILITY FUNCTIONS & INDIFFERENCE CURVES

**Commodities, Commodity Bundles and Preferences**

Commodities are Typically *Flows*, not *Stocks*

Issue of Divisibility

Weak Preference, Strict Preference and Indifference Relations

**Utility Functions**

Preferences are Defined over Commodity Bundles, *not* Individual Commodities

Utility Functions and Total Utility Curves

Important Examples: Linear, Cobb-Douglas, Leontief, Quasi-Linear

Marginal Utility and Marginal Utility Curves

Hypothesis of Diminishing Marginal Utility

Monotonic Transformations of Utility Functions

**Calculus Review (Math Handout, Section A)**

Approximation Formulas for Small Changes in Functions (Total Differentials)

**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

**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

## III. MATHEMATICAL REVIEW

**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

#### **IV. UTILITY MAXIMIZATION AND DEMAND FUNCTIONS**

##### **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

##### **Scale Properties of Functions (Math Handout, Section D)**

##### **Regular (“Marshallian”) Demand Curves and Demand Functions**

Definition of Regular Demand Functions

Examples: Cobb-Douglas, Leontief, Linear

General Properties of Demand Functions:

Walras’ Law

Scale Invariant in Prices and Income

Relationship between Price Elasticities & Income Elasticity for a Good

Market Demand Functions

#### **V. MATHEMATICAL REVIEW #3**

##### **Comparative Statics of Solution Functions (Math Handout, Section F)**

##### **Comparative Statics of Optimal Value Functions (Math Handout, Section H)**

#### **VI. COMPARATIVE STATICS OF DEMAND**

##### **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

##### **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

##### **Elasticity (Math Handout, Section B)**

Absolute, Proportionate and Percentage Changes in Variables

Definition of Elasticity and Examples

Constant Elasticity Functions

##### **Compensated Price Changes and Compensated Demand Functions**

Graphical Illustration of a Compensated Price Change

Graphical Derivation of Compensated Demand Curves

Algebraic Derivation of Compensated Demand Functions

Algebraic Derivation of the Effect of a Compensated Price Change

### **Slutsky Equation**

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

## **VII. SUPPLY OF FACTORS OF PRODUCTION**

### **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

### **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

## **VIII. DECISION MAKING UNDER RISK AND UNCERTAINTY**

Expected value  
Expected utility  
Risk aversion  
Demand for Insurance  
Investment in a Risky Asset  
Measures of Risk Aversion