

June 11, 2013

Intermediate Microeconomics

Econ 100A-B-C at UCSD

Econ 100A-B-C is the undergraduate intermediate microeconomics sequence at UCSD. The objectives of the sequence are to teach students (1) how to set up, solve and analyze optimization models, (2) to apply these mathematical models to the theory of the consumer, theory of the producer, and neoclassical markets, and (3) finally we examine the fundamentals of decision making under risk and uncertainty.

Econ 100A presents the basic mathematics of economics and the theory of the consumer. Topics include consumer choice among commodity bundles, labor-leisure choice, intertemporal choice and choice under uncertainty. Econ 100B analyzes the theory of the firm and markets when there is price taking behavior. Topics include the theory of production, commodity supply, input demand, and market equilibrium. In 100C we examine departures from the neoclassical model including imperfect competition, strategy, and asymmetric information. The prerequisites for the sequence are microeconomics principles (Economics 1) and calculus through multivariable differentiation (Mathematics 10C, 20C or 21C).

In order to properly prepare students for later classes in the sequence, avoid repetition and generally best serve the interests of the students, we require that all instructors stick to the outline described below. Suggestions are welcome but any deviation from the outline must be approved by Melissa Famulari.

In addition to the required reading for each of the following courses, students are encouraged to take advantage of the following supplemental material for the 100ABC sequence, available free over the Internet.

(1) Link to Martin Osborne's intermediate mathematics tutorial:

<http://www.economics.utoronto.ca/osborne/MathTutorial/index.html>

(2) Link to Preston McAfee's Introductory textbook (this material is at a level between most microeconomics principles textbooks and Perloff's more advanced treatment.)

<http://www.introecon.com/>

Econ 100B: Intermediate Microeconomics: Production, Costs, Supply and Competitive Markets

Econ 100B analyzes the theory of the firm and markets when there is price taking behavior. Topics include the theory of production, commodity supply and input demand in competitive markets, and competitive market equilibrium.

Required Text

Fall 2013: Perloff, Jeffrey M. (2011) *Microeconomics: Theory and Applications with Calculus*, 2nd edition.

Winter 2014, Spring 2014, Summer 2014: Perloff, Jeffrey M. (2013) *Microeconomics: Theory and Applications with Calculus*, 3rd edition. Pearson/Addison-Wesley. A custom version (a new cover, identical book) is at the bookstore for \$106.75 and is bundled with an access code to MyEconLab. MyEconLab has a searchable e-book, tests, and additional solved homework problems. See <http://pearsonmylabandmastering.com/educators/support/> for more information and Lascola, Alix Alix.Lascola@Pearson.com for a demonstration.

Mark Machina's Econ 100ABC Math Handout

Topic Outline

1. Mathematics of Comparative Statics

Comparative Statics of Equilibrium (Math Handout, Section F)

Comparative Statics of Solution Functions (Math Handout, Section G)

Comp. Statics of Optimal Value Function: Envelope Theorem (Math Handout, Sctn H)

2. Theory of Production

Production functions

Types of factors and their income

Examples: Linear, Leontief, Cobb-Douglas

Total Product Curves

Marginal Products and the law of (eventually) diminishing marginal product

Definition of Marginal product

Marginal product curves (Linear, Leontief, Cobb-Douglas)

Hypothesis of diminishing marginal product of a factor

Average Products and the Average-Marginal Relationship

Definition of average product

Average product curves (Linear, Leontief, Cobb-Douglas)

Proof of Average-Marginal relationship

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

Returns of scale

3. Theory of Cost:

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

Long run cost minimization

Isocost lines

Graphical illustration of LR cost min

FOC for long run cost min

Second order conditions (Hypothesis of diminishing MRTS)

Output constrained factor demands

Long run cost functions

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

Relationship between LR and SR cost curves.

Long and short run total cost curves

Long and short run average cost curves

Long and short run marginal cost curves

4. Profit maximization and supply under perfect competition

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 functions (increasing in output P, nonincreasing in factor P, scale invariant in factor P and output P)

Long run elasticity of supply

Short run profit maximization and supply under perfect competition.

SR profit max and shut down decision

Illustration in terms of STC and SVC

Illustration in terms of SATC and SAVC

SR supply curve of the firm

SR supply function of the firm

Examples: Cobb Douglas, Cubic

Properties of SR supply functions

increasing in output price, nonincreasing in factor prices

scale invariant in output and factor prices

SR market supply