Advanced Placement Economics

Microeconomics: 4th Edition

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Teacher Resource Manual

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Teacher Resource Manual

- Introduction to Resource Manual
  - Talks about how to use the publication
  - New and improved features
  - Top 10 Keys to teaching effective course
- Course Outline

Outline for an Advanced Placement Microeconomics Course

75 class periods of 45 minutes each

Content Area	*Percentage Goals of Exam (multiple-choice section)*
I. Basic Economic Concepts	**(8–14%)**
A. Scarcity, choice, and opportunity cost	
B. Production possibilities curve	
C. Comparative advantage, absolute advantage, specialization, and trade	
D. Economic systems	
E. Property rights and the role of incentives	
F. Marginal analysis	
II. The Nature and Functions of Product Markets	**(55–70%)**
A. Supply and demand (15–20%)	
1. Market equilibrium	
2. Determinants of supply and demand	
3. Price and quantity controls	
4. Elasticity	
a. Price, income, and cross-price elasticities of demand	
b. Price elasticity of supply	
5. Consumer surplus, producer surplus, and allocative efficiency	
6. Tax incidence and deadweight loss	
B. Theory of consumer choice (5–10%)	
1. Total utility and marginal utility	
2. Utility maximization: equalizing marginal utility per dollar	
3. Individual and market demand curves	
4. Income and substitution effects	
C. Production and costs (10–15%)	
1. Production functions: short and long run	
2. Marginal product and diminishing returns	
3. Short-run costs	
4. Long-run costs and economies of scale	
5. Cost minimizing input combination and productive efficiency	
D. Firm behavior and market structure (25–35%)	
1. Profit	
a. Accounting versus economic profits	
b. Normal profit	
c. Profit maximization: MR = MC rule	
2. Perfect competition	
a. Profit maximization	
b. Short-run supply and shutdown decision	

Teacher Resource Manual

Five units divided into lessons that provide:

- Introduction and description
- Objectives
- Time Required
- Materials (visuals and activities)
- Bell Ringer
- Procedure (life saver for newer teachers)

Perfect Competition in the Short Run and Long Run

Introduction and Description

Lesson 4 is very important because it shows students how a firm in a perfectly competitive market maximizes its total profit in the short run and in the long run. The conditions under which a firm should shut down are discussed. The short-run supply curves of a perfectly competitive firm and industry are created. The lesson also examines a perfectly competitive industry in short-run and long-run equilibrium. Students are given practice drawing graphs of a perfectly competitive firm and a perfectly competitive industry in different profit situations. When students understand the decisions made by a firm in perfect competition, the extension of this material to that of a monopoly and a monopolistically competitive firm is much easier.

Objectives

1. Explain the rules a perfectly competitive firm uses to maximize its total profit.
2. Draw graphs of a perfectly competitive firm in four short-run profit scenarios: making a positive total profit, breaking even, making a loss but not shutting down, and making a loss and shutting down.
3. Explain how a perfectly competitive firm moves from a short-run equilibrium to a long-run equilibrium.
4. Know why a perfectly competitive firm's short-run supply curve is that portion of its marginal cost curve above its average variable cost curve.
5. Be able to create the market supply curve from the horizontal summation of the supply curves of the individual firms in the market.
6. Understand how an industry's long-run supply curve is derived from a series of industry long-run equilibriums.

Time Required

Six class periods or 270 minutes

Materials

1. Activities 3-6, 3-7, 3-8, and 3-9
2. Visuals 3-5, 3-6, 3-7, 3-8, and 3-9

Bell Ringer

What happens to price and quantity in a competitive market if all firms are earning positive total profit? What happens over time if most firms are making a loss?

Teacher Alert: **Give students a lot of graphing practice in this lesson. Be sure they understand why MR = MC gives the firm's best output level and how to identify graphically the various profit, revenue, and cost measures at that output level. They need to understand how a perfectly competitive industry with profit in the short run moves to a long-run equilibrium and that all firms will break even in the long run.**

Procedure

1. Discuss the characteristics of *a perfectly competitive market.* Tell students why each firm is a *price taker* and can sell all the output it wants at the market-determined price.
2. Have students complete Part A of Activity 3-6, which has them complete a table with the three revenue measures (TR, AR, and MR) of a perfectly competitive firm. Ask them why P = AR *(because AR = TR/Q = P)* and why P = MR *(because the firm does not have to lower its price to sell an extra unit)* for a perfectly competitive firm. Part A also has students plot the TR data in one graph and the AR and MR data in a second graph. Ask students why the

Teacher Resource Manual

- Student Activities Solutions formatted the same as the Student Activities.
- Key Ideas Section next slide

- Firms are sellers in product markets and buyers in factor (resource) markets.
- The demand for any resource is derived from the demand for the products that the resource can produce. Thus, resource demand depends on the price of the good or service that the resource produces and on the resource's productivity in producing the good or service.
- The demand curve for a resource in the short run is downward sloping because the marginal physical product (MPP) of additional inputs of a resource will decrease as a result of the law of diminishing marginal returns. In some textbooks, marginal physical product is called marginal product.
- A firm will continue to hire factors of production as long as its marginal revenue product (MRP) exceeds its marginal resource cost (MRC). A firm will not hire more resources once MRC exceeds MRP.
- The marginal revenue product curve for a firm selling its product in an imperfectly competitive market will be steeper than the marginal revenue product curve for a firm selling in a perfectly competitive market. The steeper slope results from both a decrease in the marginal physical product and a decrease in the product price required to permit the firm to sell a larger output.
- A firm maximizes total profits where a factor's marginal revenue product equals the factor's marginal resource cost. A firm maximizes total profit where MRP = MRC.
- In a perfectly competitive labor market, a firm can hire all the workers it wants at the current market wage. The firm will hire workers until the last worker's wage (MRC) equals the marginal revenue product of that last worker hired.
- When a combination of resources is employed in producing a good or service, the profit-maximizing rule is

$$\frac{MRP_a}{MRC_a} = \frac{MRP_b}{MRC_b} = \frac{MRP_n}{MRC_n} = 1.$$

- When a firm produces the profit-maximizing level of output, it must utilize a least-cost combination of resources. The rule for a least-cost combination of resources is

$$\frac{MPP_a}{MRC_a} = \frac{MPP_b}{MRC_b} = \frac{MPP_n}{MRC_n}.$$

- For a firm facing a perfectly competitive resource market, resource supply is perfectly elastic and equal to marginal resource cost at a market-determined price (wage) for the resource. Under monopsony or other imperfect conditions of employment, both resource supply and marginal resource cost are positively sloped curves with the marginal resource cost being a value greater than the price (wage) for all units beyond the first unit of the resource employed.
- Given a downward-sloping marginal revenue product curve and the differences existing between supply and marginal resource cost in perfect competition and monopsony, a monopsonistic employer will pay a lower price (wage) and hire fewer units of a resource than a perfect competitor.
- Economic rent is any payment to the supplier of a resource that is greater than the minimum amount required to employ the desired quantity of the resource
- The equilibrium real interest rate influences the level of investment and helps allocate financial and physical capital to specific firms and industries.

Changes to the 4th Edition

- Content reorganized using the AP Course Outline
- Basic Economic Concepts overlaps between AP Micro edition and AP Macro edition
- Old Content has been deleted

Changes to the 4th Edition

- Teacher and student alerts have been added to both editions.

  (for example, in unit 1, lesson 1 it tells teachers to be sure to reinforce the difference between marginal and total)
- Bell Ringers have been added.
- A list of related practice free response questions from released exams is provided in each unit. (next slide)

UNIT 2 Microeconomics — UNIT OVERVIEW

Unit 2 extends the basic framework of demand and supply that was covered in Unit 1. The material in Unit 2 accounts for 13–20 percent of the Advanced Placement (AP) Microeconomics Exam. Lesson 2 has students explore how competitive markets allocate society's scarce resources. They see how market prices serve to allocate these resources to their highest valued uses. The effects of changes in one market on the price and quantity in a related market are demonstrated. This lesson uses consumer theory based on marginal utility analysis to explain why the demand curve for a good or service is downward sloping. The concept of *consumer equilibrium* is used to illustrate how a consumer can maximize total utility from a given income by allocating that budget correctly between two products.

Lesson 3 of this unit gives students an understanding of elasticity, an important concept in a microeconomics course. Elasticity measures the strength of the response of one variable to a change in another variable. The price elasticity of demand for a product indicates how strongly the quantity demanded of a product changes in response to a change in the price of that product. Students learn how to calculate and interpret the value of the price elasticity of demand, and how it is related to total revenue. The lesson also discusses income elasticity of demand, cross-price elasticity of demand, and price elasticity of supply. The effect of an excise tax is examined as well.

Unit 2 concludes with Lessons 4 and 5, which provide a discussion of price floors and price ceilings, property rights, and deadweight loss. These topics are important on the AP Microeconomics Exam because they help students understand how society suffers a reduction in social welfare when the market produces an output level different from the one that would result from a perfectly competitive market free of outside influences.

Before you begin this unit, it would be a good idea to conduct a supply and demand simulation. By simulating market behavior, students better understand the behavior behind the demand and supply curves. There are many simulations available, including "A Market in Wheat" in CEE's *Economics in Action: 14 Greatest Hits for Teaching High School Economics.*

The Lesson Planner

Lesson 1 Resource Allocation; Activity 2-1

Lesson 2 Marginal Utility and the Law of Demand; Activity 2-2

Lesson 3 Elasticities; Activities 2-3, 2-4, 2-5, and 2-6, and Visuals 2-1, 2-2, and 2-3

Lesson 4 Price Floors and Ceilings; Activity 2-7 and Visuals 2-4 and 2-5

Lesson 5 Property Rights, Market Failure, and Deadweight Loss; Activities 2-8 and 2-9, and Visuals 2-6 and 2-7

Practice Free Response Questions (FRQs)

This is a partial list of FRQs that can be used with each unit of the *Advanced Placement Economics: Microeconomics* resource manual. These questions and grading rubrics are available at AP Central on the College Board Web site: http://apcentral.collegeboard.com

2012	Question 2, part (a): consumer equilibrium, marginal and total utility
2012	Question 2, part (b): income elasticity of demand
2012	Question 2, part (c): cross-price elasticity of demand
2011	Question 1, part (d): elasticity
2011 Form B	Question 2, part (b): price ceiling
2010	Question 1, part (b): elasticity
2010	Question 1, part (c): effect of increase in demand of one good on market of another good
2010	Question 3: consumer and producer surplus; deadweight loss
2010 Form B	Question 3: price elasticity of demand; perfectly inelastic supply; burden of an excise tax
2009	Question 1, part (c): spillover benefits
2009	Question 2: excise tax; price-elasticity of demand
2009 Form B	Question 2: maximize total utility
2008	Question 2: maximize total utility; price elasticity of demand; incidence of excise tax
2008	Question 3: competitive market with a price ceiling
2006	Question 3: land has alternate uses
2006 Form B	Question 2: price ceiling

Additional Resources

To download visuals for each lesson and to find related material, visit http://www.councilforeconed.org/ap-economics

New Activities for AP Micro

- The input and output approaches to comparative advantage
- The productivity and cost functions of a firm
- Profit maximizing quantity and price for firms in different market structures
- Movement of a firm from short-run equilibrium to long-run

New Activities for AP Micro

- Consumer surplus, producer surplus, and deadweight loss
- Profit-maximizing price and quantity in factor markets
- The effect of government policies intended to correct market failures

You can download the visuals and activities for projection.

www.councilforeconed.org/ap-economics

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Use the Compound Interest Calculator to demonstrate to your students the dramatic effect that compounding can have on investments over time.

HIGHLIGHTS

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Advanced Placement Microeconomics 4th Edition Teacher Manual

Product Number: **0669**

The Council for Economic Education is pleased to introduce this fourth edition of Advanced Placement Economics. In the years since its first publication, AP Economics has become the go-to guide for helping teachers to prepare their students for the AP Microeconomics and Macroeconomics Exams administered by the College Board. We are proud of this accomplishment and believe that this current edition will continue to uphold the high standards set by its predecessors.

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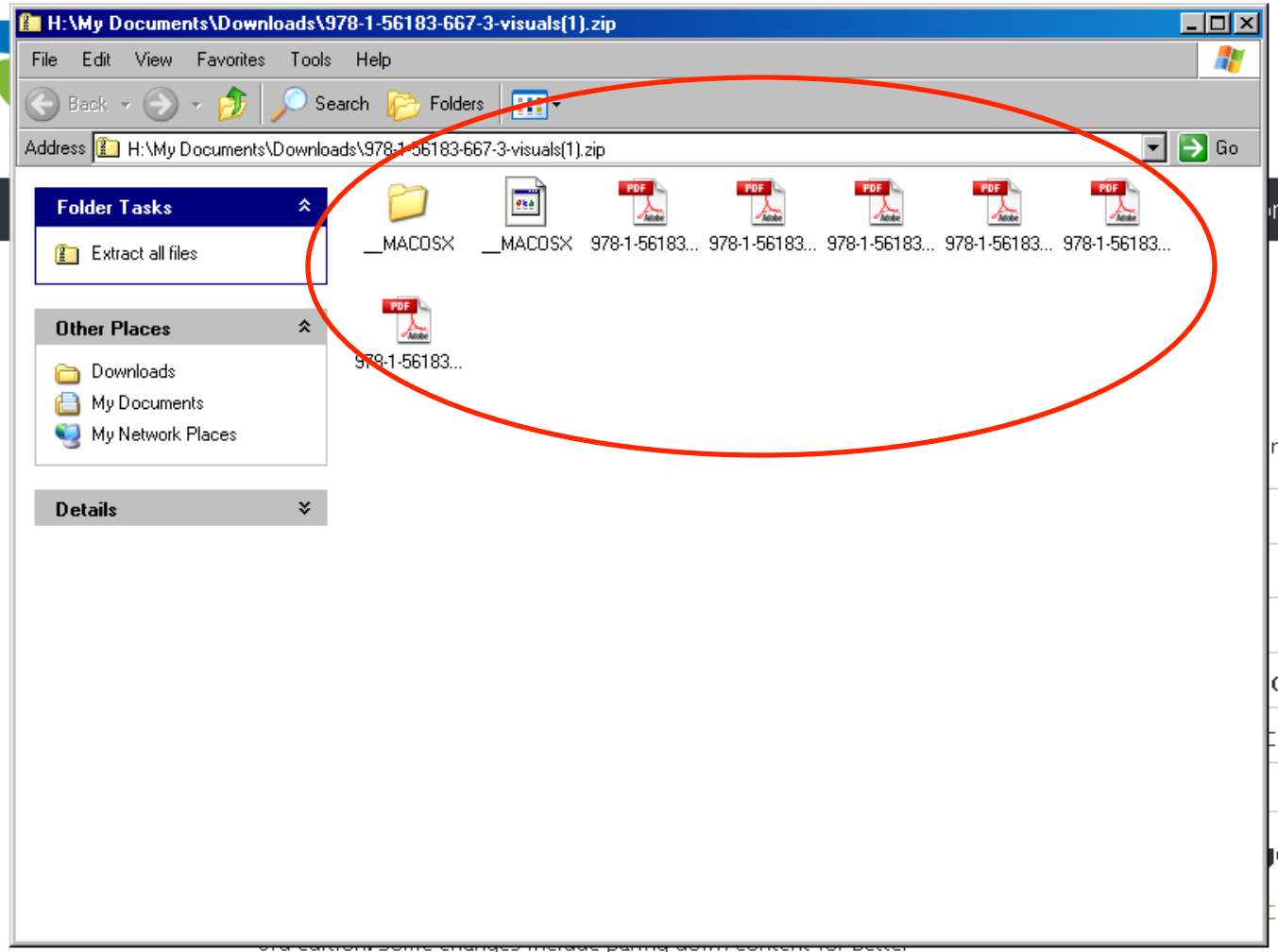
Resources

- Download Visuals (.zip)
- Download Activities (.zip)

The 4th edition of AP Economics reflects the adjustments in the AP Course Outlines and Exams in the years since the publication of the 3rd edition. Some changes include paring down content for better emphasis of essential AP economics concepts; revising lessons to utilize contemporary examples; and most importantly, addressing the current state of the test with the addition of new content. In addition, you will see some reorganization of the material in response to teacher feedback.



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emphasis of essential AP economics concepts; revising lessons to utilize contemporary examples; and most importantly, addressing the current state of the test with the addition of new content. In addition, you will see some reorganization of the material in response to teacher feedback.

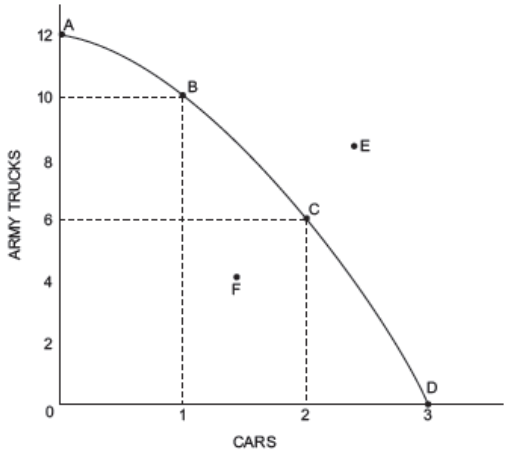
Middle School

High School

All Materials

Example of Visual

Production Possibilities Curve



(1) What trade-offs are involved?

(2) Why is the PPC concave, or bowed out, from the origin?

(3) What does a point inside the PPC illustrate?

(4) What is a historical example of a point inside the PPC?

(5) What is the significance of a point outside the PPC?

(6) Under what conditions can a point outside the PPC be reached?

(7) What would a country's PPC look like if it did not have a scarcity of resources?

Student Resource Manual

- This is where the student activities are located
- Divided up into the same units.
- Has same Key Ideas page that I showed you earlier.
- Has a 25 question sample multiple choice test with each unit. Next Slide

Circle the letter of each correct answer.

1. A downward sloping demand curve can be explained by
   I. diminishing marginal utility.
   II. diminishing marginal returns.
   III. the substitution effect.
   IV. the income effect.
   (A) I only
   (B) II only
   (C) I and III only
   (D) I and IV only
   (E) I, III, and IV only

2. If hot dogs are an inferior good, an increase in income will result in
   (A) an increase in the quantity demanded for hot dogs.
   (B) an increase in the demand for hot dogs.
   (C) a decrease in the quantity demanded for hot dogs.
   (D) a decrease in the demand for hot dogs.
   (E) no change in the demand for hot dogs.

3. Assume that coal is a normal good. If the price of coal increases and the quantity sold increases, which of the following is consistent with these observations?
   (A) The price of oil, a substitute for coal, increased.
   (B) A wage increase was given to coal miners.
   (C) New machinery made coal mining more efficient.
   (D) Consumers' incomes fell.
   (E) The demand curve is inelastic.

4. During a football game, it starts to rain and the temperature drops. The senior class, which runs the concession stand and is studying economics, raises the price of coffee from 50 cents to 75 cents a cup. They sell more than ever before. Which answer explains this?
   (A) The supply of coffee increased.
   (B) The demand curve for coffee was elastic.
   (C) The supply of coffee decreased.
   (D) The demand for coffee increased.
   (E) The demand curve for coffee was inelastic.

5. Which of the following statements best reflects the law of *diminishing marginal utility*?
   (A) "I have to have a scoop of ice cream on my pie."
   (B) "I'll never get tired of your cooking."
   (C) "The last bite tastes just as good as the first."
   (D) "I couldn't eat another doughnut if you paid me."
   (E) "I prefer to eat several small meals a day, rather than three large ones."

6. If the cost of producing automobiles increases, the price, equilibrium quantity, and consumer surplus will most likely change in which of the following ways?

	Price	Quantity	Consumer surplus
(A)	Increase	Increase	Increase
(B)	Increase	Decrease	Increase
(C)	Increase	Decrease	Decrease
(D)	Decrease	Increase	Decrease
(E)	Decrease	Decrease	Decrease

Revenue, Profit, and Rules to Maximize Total Profit

Now that you have explored the productivity and cost functions of a firm, you are ready to learn about its revenue and profit functions. It is important to note that the productivity and cost graphs look the same for any firm, regardless of whether the firm sells its output in a perfectly competitive, monopolistic, monopolistically competitive, or oligopolistic product market. Think of it this way: suppose you run a firm that produces computers. The productivity of your workers in your factory will determine your cost of producing computers. But now you are ready to take your computers from the factory and transport them to the product market to sell them. As we will see in subsequent activities, the shapes of your revenue functions will depend on how much competition you face in the product market. So although your productivity and cost functions are not affected by the product market, your revenue and profit functions will be. (We will see in Unit 4 that the factor markets for your resources will affect the prices you pay for inputs and thus will affect your cost functions.)

Part A: Revenue Terms

Student Alert: **The distinction between total, marginal, and average measures is important!**

There are three revenue terms you need to understand before you can answer questions about profit maximization. When a firm sells its product, the revenue it receives can be described in the three ways shown in Table 3-5.1.

Table 3-5.1
Three Measures of Revenue

Measure of revenue	Meaning	How to calculate
Total revenue (TR)	The total income the firm receives from selling a given level of output (Q) at a particular price (P)	TR = P x Q
Average revenue (AR)	The revenue the firm receives from one unit at a given level of output	AR = TR/Q
Marginal revenue (MR)	The change in total revenue resulting from the firm selling one more unit of output	MR = ΔTR/ΔQ

The shapes of these revenue functions will depend on the type of product market in which a firm sells its good or service. The key point to watch for is whether a firm has to lower its price to sell more of its product. You will calculate values of these revenue measures and draw graphs of them in other activities where the type of product market is specified.

What are your questions?