



**LEAD CITY UNIVERSITY**  
**Faculty of Social and Management Sciences**  
**Department of Economics**

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**COURSE PARTICULARS**

Course Code: ECO 411  
Course Title: Advanced Microeconomics II  
Number of Units: 2  
Status: Compulsory

**LECTURERS DETAIL**

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Area of Specialization: Energy Economics

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Area of Specialization: Monetary Economics

**COURSE DESCRIPTION:**

Cost and Production Function; optimisation in the theory of firm; duopoly, oligopoly and bilateral monopoly; linear programming analysis of the firm; general equilibrium; theory of production-wages, rent, profit and interest; social welfare function and pareto optimal criterion.

**COURSE OBJECTIVE:**

Advanced Microeconomics II extend the basic ideas and concepts from the course Microeconomics I of the First semester. It introduces the students to the strategic interaction in the theories of production, costs and markets. In the context of the course, the students will get familiar with how interactions take place among all the micro economic agents - individuals and firms.

**ASSESSMENTS:**

Attendance, Assignment and Test - 30 per cent

Examination - 70 per cent

Total - 100 per cent

**TEACHING PLAN**

Week	Topic
Week 1-2	<b>Theory of Costs:</b> <ul style="list-style-type: none"> <li>• Meaning and Function,</li> <li>• Short Run and Long Run,</li> <li>• Tutorials</li> </ul>
Week 3-5:	<b>Theory of Production:</b> <ul style="list-style-type: none"> <li>• Meaning &amp; Functions,</li> <li>• Average and Marginal Product,</li> <li>• Isoquant and Isocost</li> <li>• Return to Scale</li> <li>• Technical Rate of Substitution and Elasticity of Substitution</li> <li>• Tutorials</li> </ul>
Week 6:	<b>Optimization in the Theory of Firm:</b> <ul style="list-style-type: none"> <li>• Output maximisation and Cost minimisation</li> <li>• Tutorials</li> </ul>
Week 7-10:	<b>Market Structure</b> <ul style="list-style-type: none"> <li>• Meaning of Monopolistic market</li> <li>• Market Equilibrium Analysis under Monopoly</li> <li>• Price Discrimination by Monopoly</li> <li>• Profit Maximisation by Price Discriminating Monopoly</li> <li>• Bilateral Monopoly</li> <li>• Monopolistic Competition</li> </ul>

	<ul style="list-style-type: none"> <li>• The Oligopoly Market Structure</li> <li>• Classical or Non-Collusive Model of Duopoly</li> <li>• Tutorials</li> </ul>
<b>Week 11:</b>	<b>General Equilibrium</b> <ul style="list-style-type: none"> <li>• Tutorials</li> </ul>
<b>Week 12:</b>	<b>Social Welfare Function</b> <ul style="list-style-type: none"> <li>• Pareto optimal criterion</li> <li>• Tutorials</li> </ul>
<b>Week 13-14:</b>	<b>Social Welfare Function</b> Revision

#### READING LISTS:

1. Henderson and Quandt- Microeconomic theory. Second edition
2. Koutsoyannis. A- Modern microeconomics. Second edition (Lond: Macmillian Press, 1979)
3. Schotter A. (2001) Microeconomics: a Modern approach. 3<sup>rd</sup> Edition, Adison Wesley Longman.
4. Varian, Hal, R. (1999) Intermediate Microeconomics: A Modern Approach. 5<sup>th</sup> Edition, New York
5. Eaton, B.C. and D.F. Eaton (1991) Microeconomics, 2<sup>nd</sup> Edition, New York: W.H. Freeman & Company.

#### TUTORIAL QUESTIONS

1. Suppose MTN and ETISALAT are the only two firms offering mobile phone services in the country with the following market demand:

$$P = 100 - 0.5(q_s + q_m)$$

Their cost functions are  $C_1 = 5q_s$  and  $C_2 = 0.5q_m^2$

Calculate:

- i. The best response functions for  $q_s$  and  $q_m$ .
- ii. Market equilibrium output and price.
- iii. Profits for starcomms and multilinks

2. Given the following Cobb Douglas production function:

$$Q = Ax_1^\alpha x_2^\beta$$

Calculate:

- i. Average Product
- ii. Marginal Product
- iii. Technical Rate of Substitution

3. Given a Cobb-Douglas Production function  $q = AL^\alpha K^{1-\alpha}$

- (i). Find the  $MRTS_{LK}$
- (ii). Prove that the elasticity of substitution equals to unity
- (iii). Show that the Euler's theorem holds

4. Distinguish appropriately between the following pairs of economic terms:

- (a) First Order Condition and Second Order Condition
- (b) Long Run Equilibrium and Short Run Equilibrium
- (c) Constrained Optimization and Unconstrained Optimization
- (d) Perfect Competitive Market and Imperfect Competitive Market

5. (a). A production function is given by  $12K^{\frac{3}{4}}L^{\frac{1}{4}}$  and production cost function is  $80 - 3L - K = 0$
- (i) Determine the elasticity of substitution index between L and K and interpret your results
  - (ii) Find the least cost combination of labour and capital

- (b).  $C = q^3 - 10q^2 + 17q + 66$
- (i) Determine the output level which he maximize profit if  $P = \text{N}5$
  - (ii) Compute the output elasticity of cost at that output level

6. Give a detailed explanation on the following:

- i. Return to Scale
- ii. Elasticity of Substitution
- iii. Technical Rate of Substitution

7. Given a production function:  $Q = K^{1/4} L^{3/4}$ , with price of capital N600 and price of labour N500. If the production expenditure budget of the firm in N6,000.

- a. What would be the input demands for capital and labour with their associated maximum output?
- b. What is the marginal utility of money at the point of equilibrium?

- c. What is the relative price of capital at equilibrium?
- d. How will increase in the price of labour N600 or increase in expenditure to N9,000 affect input demands and output?
8. A plastic manufacturing plant utilises only 2 factors,  $x_1$  and  $x_2$ , in its production process. As an optimising firm, it faces the following production function
- $$f(x_1, x_2) = y = TX_1^\alpha X_2^\beta$$
- a. find conditional factor demand functions for inputs  $x_1$  and  $x_2$ , if they cost  $w_1$  and  $w_2$  respectively.
- b. If  $Y = 500$ ,  $w_1 = 6$ ,  $w_2 = 5$ ,  $T = 4$ ;  $\alpha = 1/2$  and  $\beta = 1/4$ . Find the value of  $x_1$  and  $x_2$  based on the result of (a) above.
- c. What type of return to scale does the production exhibit? Then advise the company on the viability or otherwise of the production.
9. Lanfaith group of company recently won the lone licence to generate and distribute cooking gas to alesinloye and bodija markets in Ibadan with the following respective demand functions.
- $$Y_a = D_a(P_a) = 1200 - P_a$$
- $$Y_b = D_b(P_b) = 1200 - 3P_b$$
- The cost function of the company is given as  $C = 350 + 150Y$
- As economic expert, advise the CEO if the company should discriminate or not in maximising its profit.
10. Suppose a production function is  $Q = 8L^{0.4}K^{0.6}$   
Where Q, K and L stand for output, capital and labour respectively.
- a) Obtain the MRTS between L and K
- b) Determine the  $AP_L$  and  $AP_K$
- c) Compute the output elasticity of L and K
- a. Determine the degree of homogeneity of the function and make economic interpretation of your answer
11. Explain the following criteria for Social welfare
- (e) Bentham's criterion
- (f) Pareto optimality criterion
- (g) Kaldon-Hicks criterion
- (h) Bergson criterion
12. Two Firms, XYZ Ltd and ABC Nig. Plc have a patent right on a component part used in the production of rubber to produce tires. Assume the two firms in a duopolistic market are faced with the following demand function.

$P = 100 - 0.5(Q_1 + Q_2)$  and the cost condition firm 1 and 2 are

$$C_1 = 5Q_1 \quad \text{and} \quad C_2 = 0.2Q_2^2$$

Where  $Q_1$  is output of duopolist 1, and  $C_1$  is the total cost of duopolist I, determine the optimal levels of output, price and profits with:

- (a) Firm 1 (XYX Ltd) as the leader and Firm 2 (ABC NigPlc) as the follower
- (b) Firm 2 (ABC NigPlc) as the leader and Firm 1 (XYX Ltd) as the follower

