LEAD CITY UNIVERSITY

Faculty of Social and Management Sciences
Department of Economics

COURSE PARTICULARS

Course Code:	ECO 112
Course Title:	Introductory Mathematics for Economics II
Number of Units:	2
Status:	Compulsory

LECTURERS DETAIL

Name:	(1)	Mr. T.O. Emiola
Qualifications:		B.Sc (Econs), M.Sc (Econs)
Phone:		08052283536
Email:		yinka122000@gmail.com
Area of Specialization:		Monetary Economics
Name:	(2)	Mrs A. O. Oduyoye-Ejumedia
Qualifications:		B.Sc & M.Sc (Econs)
Phone:		08039168305
Email:		babyjasb@yahoo.com
Area of Specialization:		Energy Economics

COURSE DESCRIPTION

Functions and Equations: Definitions and Types of Functions, Definitions and Types of Equations; Rates, Taxes and Insurance; Techniques of Differentiation; Logarithm, Trigonometric, Exponential Functions and Matrices.

COURSE OBJECTIVES

The students, at the end of the course should be able to:

- Know the basic mathematical concepts and principles

-Get Exposed to the application of the principles to economic issues

COURSE ASSESSMENT

Attendance	10 marks
Test	20 marks
Exam	70 marks
Total	**100 marks**

TEACHING PLAN

Week	Topic
Week 1 - 2	Functions
Week 3 - 4	Equations
Week 5 - 6	Rates, Taxes and Insurance
Week 7	Exponential Functions
Week 8 - 9	Logarithm
Week 10 - 11	Techniques of Differentiation
Week 12 - 13	Matrices
Week 14	Trigonometric
Week 15	Revision and Examination

READING LISTS

Edward T. Dowling (2001): Introduction to Mathematical Economics. Third edition, Schaum Outlines, McGraw-hill Company, Singapore.

Bittinger M.L., Ellenbogen D. J. and Johnson. B. L. (2001). Elementary and Intermediate Algebra: Concepts and Applications, A combined Approach. Third edition

Baldani J. and R. Turner (1996): Mathematical Economics. The Dryden Press, Orlando

Hoy M., J. Livernois, C. Mckenna, R. Ress and T. Stengos (2001) Mathematics for Economists, 2nd edition, MIT Press, Cambridge

Knut S. and P. Hammond (2006): Essential Mathematics for Economic Analysis. Second edition. Prentice-Hall Int, London.

IAN JACQUES (2006). Mathematics for Economics and Business

TUTORIAL QUESTIONS

1. a) Simplify $\log_a 3/8 + 2\log_a 4/5 - \log_a 5/6$

   b) Using logarithms, solve the equation $3^{x+2} = 5(2^x)$

2. a) Write short notes on (i) an equation (ii) a function

   b) Mention types of equations with at least two (2) mathematical examples of each.

   c) Given $f(x) = x^2 + 4x - 5$. Find i. f (5) ii. f (-3)

3. If $p = \log_7 14/15$, $q = \log_7 21/20$ and $r = \log_7 49/50$, what are the values of

   (i) $p + q - r$ (ii) $p + 3q - 2r$

   given that $\log_7 2 = 0.356$ and $\log_7 3 = 0.566$

4. a) Solve for x in the equations i) $8x^2 - 20x + 3 = 0$

   ii) $5x^2 - 55x - 140 = 0$

   b) List the different ways a quadratic equation and a simultaneous equation can be solved.

   c) What is a tax and write short notes on the forms of taxes with examples each.

5. a) If $y = (1 - 4x^2)\text{Cos}2x$, find the derivative of x and obtain its value when $x = 90$.

   b) Given that $s = 3t^2 - \frac{1}{2t}$, find the derivative of s with respect to t when t = 2.

6. a) Solve these set of equations using elimination or substitution method

   Qs + 32 - 7p = 0

   Qd - 128 + 9p = 0

   b) Mention types of functions with at least two (2) mathematical examples of each.

   c) Subtract $(6xy^3 - 2xyz)$ from $(8xy^3 + 7xz)$

7. Differentiate the following functions with respect to x

   a) $\frac{x^4 + 5x^2 + 3}{3x^2}$ b) $(x - 1)^3(3x - 2)^2$

8. a) Solve the in the linear equation $5(2x + 3) - 4x = 3(8 - x + 3)$

   b) Find the range of the function f: X-Y such that Y = 5x – 1 and X = (3, 5, 7 and 9)

c) Solve these set of equations using elimination or substitution method

Qs = - 40 + 6p

Qd = 440 - 10p

9. a) Define the following Matrices, giving at least two examples of each

i) Diagonal Matrix ii) Null Matrix iii) Identity Matrix

b) Determine whether the following matrices are singular or non-singular

i) $A = \begin{pmatrix} 2 & 0 & 11 \\ -12 & -1 & 0 \\ 1 & 0 & 31 \end{pmatrix}$ ii) $B = \begin{pmatrix} 2 & -4 \\ -1 & 2 \end{pmatrix}$

iii) C = $\begin{pmatrix} 10 & 0 & 6 \\ 3 & 2 & -2 \\ -5 & 0 & -3 \end{pmatrix}$

10. A man earns N4, 000, 000 per annum and his wife has an annual salary of N3, 500, 000. Allowances and income taxes are calculated on their combined salaries. The information below shows the tax free allowances;

Husband's personal allowance	N500,000
Wife's personal allowance	N240,000
Pension fund	N300,000
Children's allowance (3 children)	N40,000 each

The rates of tax are as followed;

On the first N140,000	30%
On the next N260,000	40%
On the remainder (if any)	30%

Calculate:

i. Their total allowances ii. Their taxable income iii.The amount of tax payable.

11. Solve the system of simultaneous equations below by Matrix inversion method

2x + 4y – 6z = 12

4x + 2y + 4z = 2

6x + 6y – 4z = 16

12. An old man in your village buys a plot of land for N350, 000. He paid a deposit of 60% with the monthly feeding allowance by his children which he saved under his old trunck

box and the interest of 20% per annum is charged on the balance for the full payment of the land.

i Determine the amount of the deposit ii. How much is the balance to be paid
iii. Calculate the interest payable iv. What is the total amount to be repaid
v. Find the amount of each installment in 10 months.