Course No.   **ECONA307**
Course title: **Mathematical Economics**
Nature of Course: **DSE – 7**
Number of credits: **6**
Number of Lectures (L): Practical (P): Tutorial (T): : 44:0:16

Course Description

The main objective of this paper is to train the students to use the techniques of mathematical and statistical analysis, which are commonly applied to understand and analyze economic problems. The emphasis of this paper is on understanding economic concepts with the help of mathematical methods rather than learning mathematics itself. Hence in this paper a student will be initiated into various economic concepts, which are amenable to mathematical treatment.

Course Outline

Unit	Title	Credits	
		L	T
I.	**Introductory Concepts** Set and set theories. Equations of Straight Line. Concept of slope and Intercept. Point of intersection of two lines. Application of straight lines in Economics: Demand and supply analysis, determination of equilibrium price and quantity. Arithmetic and Geometric Progressions and their Applications.	11	4
II.	**Differentiation** Functions: Constant, Polynomial; Relation and Function. Simple Differentiation and economic applications, Marginal utility, marginal revenue and marginal cost, Elasticity. Partial derivatives and economic applications (homogeneous functions and Euler's Theorem, Partial Elasticity). Maxima and Minima of Functions of One and Two Variables; unconstrained Optimization Problem.	11	4
III.	**Concept of Matrix and Determinant** Matrices: Meaning and types of matrices, Operation of Matrices: Addition, subtraction, multiplication (3x3), division. Determinant, Properties of determinant (without proof). Rank of matrix, trace, adjoint and inverse of a matrix, solution to linear equations - Cramer's rule - Inverse method. Application in economics.	10	4
IV.	**Input – Output & Linear Programming** Input- Output Model: technological coefficient Matrix (2 sector & 3 Sector Model), Hawkins Simons Conditions. Static Leontief Solution. Linear Programming: Meaning, Basic concepts, Primal and Dual, Nature of feasible, basic and feasible solution, Graphical solution to linear programming problem (only two variables).	12	4
Suggested Readings: 1. Allen, R.G.D (1974) Mathematical Analysis for Economics, McMillan Press, London. (reprint edition) 2. Chiang, A.C., Fundamental Methods of Mathematical Economics, McGraw Hill, New Delhi (recent edition). 3. Jeffrey Baldani et al. (2009), An Introduction to Mathematical Economics, Cengage Learning, Delhi. 4. Taro Yamane, Mathematics for Economist, Prentice- Hall of India.			