COURSE TITLE	**Application of Mathematics for Economic Analysis**

Course Learning Outcomes:

On successful completion of the module students will be able to:

1. To provide a wider and deeper exposure to the Calculus of functions and their application to the discipline of Economics.
2. To help students gain an understanding of how to solve mathematical problems that are common to economic modeling.
3. To facilitate the ability of students to demonstrate the economic applications of differentiation, and use it to formulate economic problems.
4. To help in developing the ability to accurately translate complex economic problems into mathematical models and hone the skills to solve the problems through a wide array of mathematical techniques.

Gist of this course in maximum 3 to 4 lines	The course is based on basic calculus and application to the discipline of Economics that would enable students to comprehend mathematical modeling techniques that can be applied to various economic scenarios/problems to find solutions.

Detailed syllabus

Unit	CONTENTS OF THE COURSE	No. of Lectures
1.	**1. Functions, Limits and Continuity Contents:** 1.1 Types & Graphical Representation of functions 1.2 Increasing and decreasing functions 1.3 Minima and maxima (Absolute and Relative) 1.4 Limits – Direct Substitution, Rationalization and Factoring 1.5 Continuity	12
2.	**2. Title of the Topic: Introduction to Derivatives and Economic Applications** 2.1 Derivative of a function 2.2 Rules for Differentiation 2.3 Differentiation of Implicit Functions 2.4 Cost and Revenue Concepts	15
4.	**4. Title of the Topic: Fundamentals of Matrix Algebra** 4.1 Types of Matrices and Basic Matrix Operations 4.2 Adjoint and Inverse of a Matrix 4.3 Solution of Linear Equations – Cramer's Rule 4.4 Introduction to Input-Output Analysis	17
5.	**5. Title of the Topic:** Contents: **Game Theory** 5.1 Pure and Mixed Strategy Solutions 5.2 Two-person zero sum game	10

	5.3 Prisoner's Dilemma&Nash Equilibrium 5.4 Concept of Expected Utility	
	Total Number of Lectures	**54**

Suggested Reference Books:
1. Simon, C. and L. Blume, *Mathematics for Economists*, Norton, London, 1994
2. Chiang, A. C., *Fundamental Methods of Mathematical Economics*, McGraw-Hill,1984
3. Sydsaeter, K. and P. J. Hammond, *Mathematics for Economic Analysis*, Pearson, Education Asia, 1995
4. Intriligator, M.D., *Mathematical Optimization and Economic Theory*, Prentice-Hall, 1971
5. Roberts B. and D.L. Schultze, *Modern Mathematics and Economic Analysis*, W.W. Norton and Company, 1973
6. Dowling, Edward T. *Introduction to Mathematical Economics*. Tata McGraw-Hill Edition

Recommended Readings:

1. Michael Hoy, John Livernois, Chris McKenna, Ray Rees and Thanasis Stengos , *Mathematics for Economics,3rdedition,MIT Press.*
2. Renshaw, G. Maths for Economics (2nd Edition, Oxford University Press, 2009)