

SVKM's Narsee Monjee College of Commerce & Economics

Program: B.Com. (Economics)				Semester: IV	
Course: Mathematical Economics Academic Year: 2024-25				Code:	
Teaching Scheme				Evaluation Scheme	
Lectures	Practicals	Tutorials	Credits	Internal Continuous Assessment (ICA) (weightage)	Term End Examinations (TEE) (weightage)
60	Nil	Nil	04	40 Marks	60 Marks
Learning Objectives:					
<ul style="list-style-type: none"> Develop a strong understanding of the mathematical tools and techniques commonly used in economic analysis, including calculus, linear algebra, optimization methods, and differential equations. Enhance problem-solving skills by applying mathematical models to analyze and interpret economic phenomena, such as consumer behavior, production functions, equilibrium in markets, and macroeconomic dynamics. To enable students to use mathematical techniques to assess the impact of economic policies, evaluate trade-offs, and make informed policy recommendations based on rigorous quantitative analysis. 					
Learning Outcomes:					
At the end of the course, the students should be able to:					
<ul style="list-style-type: none"> Students will demonstrate proficiency in applying mathematical techniques to solve complex economic problems, including optimization, differentiation, integration, matrix algebra, and solving systems of equations. Students will acquire the ability to conduct quantitative analysis of economic data, interpret economic models, analyze economic trends, and make predictions about economic outcomes using mathematical models. Students will effectively communicate their economic analysis and findings using mathematical notation, graphs, charts, and written explanations, demonstrating their ability to convey complex economic concepts and results to various stakeholders. 					
Pedagogy: Classroom Learning, problem solving, case studies, games and simulations, peer teaching, role play, projects or assignments.					
Detailed Syllabus: (Per session plan)					
Session Outline For Mathematical Economics					
Each lecture session would be of one hour duration (60 sessions)					

Module	Module Content	Module Wise Pedagogy Used	Module Wise Duration
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I	<p>Basics of mathematical economics:</p> <p>Theory of Sets, Equations: Linear and Quadratic, Simultaneous equations, Functions: Linear function, quadratic function, polynomial function of degree n, rational function and power function, matrices and determinants, applications of matrices to the solution of linear equations, cramer's rule, applications of matrices and determinants in economics.</p>	Class room lectures	11
II	<p>Differentiation of First and Higher Orders - Maxima and Minima and their Application in Economics (eg. Profit, Cost, Revenue, etc.)</p> <p>Convexity, Concavity and Point of Inflexion: concepts and their uses.</p>	Class room lectures	12
III	<p>Partial Differential Coefficients. Homogeneous Functions - Cobb-Douglas Production Function: Concept, Uses and Applications of Optimization.</p> <p>Integration and its Uses. Elementary Idea of Differential Equations and their Uses. Consumer's surplus and Producer's Surplus.</p>	Class room lectures	10
IV	<p>Linear programming: Transformation of linear inequalities into linear equation: Slack variable,- Geometry of linear programming problem-feasible and basic solution, duality, symmetry between primal and dual-an economic interpretation of duality.</p> <p>Input-output analysis: Technological coefficient matrix, closed and open input-output model, the Hawkins-simon conditions, leontief production function.</p>	Class room lectures	12

Reference books:

1. Fundamental Methods of Mathematical Economics by C. Alpha Chiang
2. Mathematics for Economic Analysis by K. Sydsaeter and P. Hammond: Pearson Educational Asia: Delhi (2006)
3. Mathematics for Economists by Mehta and Madnani.