SVKM′s Narsee Monjee College of Commerce& Economics

Program: B.Com (Economics & Analytics) and Bcom(Economics)				Semester: III	
Course: Basics of 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:

- 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:

- 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 Basics of Mathematical Economics
Each lecture session would be of one hour duration (45 sessions)

Module	Module Content	Module Wise Pedagogy Used	Module Wise Duration	Module Wise Reference Books

I	**Basics of mathematical economics:** Theory of Sets, Equations: Linear and Quadratic, Simultaneous equations, Functions: Linear function, quadratic function, polynomial function of degree n, rational function and power function, matrcies and determinants, applications of matrices to the solution of linear equations, cramer's rule, applications of matrices and determinants in economics.	Class room lectures	11	Mehta-Madnani chapter 1, chapter 4, and chapter 5
II	Differentiation of First and Higher Orders - Maxima and Minima and their Application in Economics (eg. Profit, Cost, Revenue, etc.) Convexity, Concavity and Point of Inflexion: concepts and their uses.	Class room lectures	12	Mehta-Madnani chapter 7, chapter 8,
III	Partial Differential Coefficients. Homogeneous Functions - Cobb-Douglas Production Function: Concept, Uses and Applications of Optimization. Integration and its Uses. Elementary Idea of Differential Equations and their Uses. Consumer's surplus and Producer's Surplus.	Class room lectures	10	Mehta-Madnani chapter 10, chapter 13,
IV	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. Input-output analysis: Technological coefficient matrix, closed and open input-output model, the Hawkins-simon conditions, leontief production function.		12	Mehta-Madnani chapter 18, chapter 19,

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)

Evaluation Pattern

The performance of the learner will be evaluated in two components. The first component will be a Continuous Assessment with a weightage of 40% of total marks per course. The second component will be

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a Semester end Examination with a weightage of 60% of the total marks per course. The allocation of marks for the Continuous Assessment and Semester end Examinations is as shown below:

a) Details of Continuous Assessment (CA)
40% of the total marks per course:

Continuous Assessment	Details	Marks
Component 1 (CA-1)	Class Test	20 marks
Component 2 (CA-2)	Assignment	20 marks

b) Details of Semester End Examination
60% of the total marks per course. Duration of examination will be two and half hours.

Question Number	Description	Marks	Total Marks
Q1.	Answer any One out of Two (Module I)	12 x 1	12
Q2.	Answer any One out of Two (Module II)	12 x 1	12
Q3.	Answer any One out of Two (Module III)	12 x 1	12
Q4.	Answer any One out of Two (Module IV)	12 x 1	12
Q5.	(a) Case Study	6 x 1	6
	(b) Give economic reasons/ Explain the following statements	3 x 2	6
	Total Marks		60