UNIVERSITY OF MADRAS

B.A. DEGREE PROGRAMME IN ECONOMICS

SYLLABUS WITH EFFECT FROM 2023-2024

SECOND YEAR-SEMESTER - III

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
204C3B	**MATHEMATICS FOR ECONOMICS**	**Core -VI**					5	5	25	75	100

Learning Objectives	
C1	To integrate the concepts of Economics with Mathematical tools.
C2	To use Matrices to find solutions in Economics.
C3	To apply the applications of Matrix algebra and its uses
C4	To know the differentiation and its function
C5	To understand the second order derivatives and its maxi mini function

UNIT	Contents	No. of Hours
I	**Introduction** Variables, Constants, Equations and its types – Uses and limitations of Mathematics in Economics- Functions of one or more variables – Linear function, Parabola, Rectangular Hyperbola- Exponential, Logarithmic, Power function and Homogenous Function – Applications in Economics	12
II	**Matrix Algebra and Determinants** Types of Matrices- Matrix Operations – Addition – Subtraction- Matrix Multiplication – Transpose –Determinants, Inverse and Properties (Problems).	15
III	**Applications of Matrix Algebra** Solving a system of Linear Equations – Cramer's Rule and Matrix Inverse Method- Leontief's Input-Output Model – Open and Closed Model- Components, Uses, and Limitations- Hawkins – Simon Conditions for Viability of Input and Output Model (Problems).	18
IV	**Differentiation** Limits and Continuity –Differentiability of a Function – Slope of a Curve – Increasing and Decreasing Functions – Rules- Exponential and Logarithmic Functions -Implicit Differentiation– Economic Applications: Marginal and Elasticity Concepts – Relationship between AR, MR, and Price Elasticity of Demand – Relationship Between Average and Marginal Cost.	15
V	**Optimization (Single Variable)** Second Order Derivatives–Maximization and Minimization of a Function– Economic Applications – Output and Revenue	

	Maximization -Cost Minimization – Profit Maximization under Perfect Competition, Monopoly, Discriminating Monopoly (Problems).	15
	Total	**75**
Course Outcomes		**Programme Outcomes**
CO	On completion of this course, students will	
1	Understand Basic Concepts of Mathematics and its application in Economics.	PO1,PO3
2	Analyze the relevance of the Types of Matrices	PO1,PO2
3	Calculate optimal values in the system of Equations and the importance of Input-Output Analysis	PO2,PO3
4	Gain knowledge of the rules of Differentiation and its Economic Applications	PO1,PO2, PO3
5	To optimize single variable functions in Economics	PO1,PO3
Textbooks		
1	Mehta and Madnani (2019) Mathematics for Economists Sultan Chand and Sons	
2	Edward T. Dowling,(2002) "Mathematical Methods for Business and Economics", Schaum's Outline Series, 3rd Edition, McGraw Hill	
3	Renshaw Geoff, (2005) Maths for Economics, 3rd Edition Oxford University Press, Oxford	
4	Carl P Simon & Lawrence E. Blume,"Mathematics for Economists", Published by W. W. Norton & Company,2010	
5	Ian Jacques, "Mathematics for Economics and Business", Pearson, 2018	
Reference Books		
1.	Chiang, A. C., Fundamental Methods of Mathematical Economics, McGraw-Hill, 1984	
2.	G. Hadley, Linear Algebra Addison – Wesley Publishing Company, 1977.	
3.	K. Sydsaeter and P Hammond, Mathematics for Economic Analysis, Pearson Educational Asia, Delhi 2002.	
4.	Mabett. Alan J Workout for Mathematics for Economist McMillan 1986.	
5.	R.G.D. Allen, Mathematical Analysis for Economists Macmillan and Co.Ltd.,2008	
Web Resources		
1.	https://www.coursera.org/learn/mathematics-for-economists	
2.	https://mitpress.mit.edu/9780262294805/mathematics-for-economics/	
3.	https://hummedia.manchester.ac.uk/school/soss/economics/pg/psmaths/pre-sessionmathbook.pdf	
4.	https://mitpress.mit.edu/9780262046626/mathematics-for-economics/	

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Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3	3	3	3	3	3	3	3
CO 2	3	3	3	3	3	3	3	3
CO 3	3	3	3	3	3	3	3	3
CO 4	3	3	3	3	2	3	3	3
CO 5	3	2	3	3	3	3	3	3
Weightage	15	14	15	15	14	15	15	15
Weighted percentage of course contribution to POS	3.0	2.8	3.0	3.0	2.8	3.0	3.0	3.00

S-Strong-3 M-Medium-2 L-Low-1

Level of Correlation between PSO's and CO's

CO /PO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	2	2
CO2	3	3	2	2	2
CO3	3	3	2	2	2
CO4	3	3	3	2	3
CO5	2	2	3	3	3
Weightage	14	14	12	11	12
Weighted percentage of Course Contribution to PSOs	2.8	2.8	2.6	2.2	2.6

Strong-3 M-Medium-2 L-Low-1