

GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS), SKLM
I Year B. A. Programme (UG) Courses – Under CBCS
Semester – II- Paper – IV (Major-Core)
Mathematical Methods for Economics
(w.e.f 2024-25 Admitted Batch)

Course Objectives: This course is to provide basic understanding about mathematical methods relevant to economics and skills to apply them in understanding various economic issues.

Course Learning Outcomes:

After studying this course, the student shall be able to achieve the following outcomes:

CO1: Explain the basics of sets, functions and their graphical representation

CO2: Learn the rules of differentiation and apply the same to economic problems

CO3: Learn and use maxima and minima to Optimization problems in economics

CO4: Apply rules of integration to estimate the size of consumers' and producers' surplus

CO5: Solve the economic problems through the application of the Matrix Theory

Unit1: Sets & Functions

- Role of Mathematical Methods in Economics
- Sets: Types, Operations
- Functions: Meaning, Types, Graphical Representation, Applications in Economics.

Unit2: Differential Calculus

- Limits of Functions.
- Derivative of a Function; **Meaning and Definitions**, Rules of Differentiation
- First and Second Derivatives and their Interpretations; Partial Derivatives
- Applications of Derivatives in Economics

Unit3: Optimization Problems and their Applications

- Optimization Problems and their Applications
- Meaning and definition of maxima and minima, difference between maxima and minima;
- Concept of Optimization in mathematics; Problems of Maxima and Minima
- Some Applications of Optimization in Economics.

Unit4: Integrations and Linear Programming

- Concept of integration; Simple Rules of Integration

- Application of Integrations in Economics
- Linear Programming: Basic Concept, Formulation of Problem; Feasible, Basic and Optimal Solutions
- Applications of Linear Programming in Economics.

Unit5:Matrices and Determinants and Applications in Economics

- Matrix: Concept, Types; Matrix Operations: Addition, **Matrix Subtraction**, Multiplication.
- Determinants, Inverse of a Matrix
- Solution to the System of Simultaneous Equations, Cramer's Rule
- Some Applications of Matrix Theory in Economics

References:

1. Alien, R.G.D.(1974),*Mathematical Analysis for Economists*, Macmillan Press and ELBS, London.
2. Chiang,A.C.(1986),*Fundamental Methods of Mathematical Economics*, McGraw Hill, New York.
3. Yamane,Taro (1975),*Mathematics for Economists*, Prentice Hall of India New Delhi.
4. Heijdra, B.J. and V.P. Fredericck (2001), *Foundations of Modern Macro economics*, Oxford University Press, New Delhi.
5. KnutSydsaeter and Peter Hammond (2008), *Mathematics for Economic Analysis*. Pearson education.
6. Open Source Online Materials & Videos: IGNOU, e-PG Pathasala, SWAYM, Khan Academy etc.

Suggested Activities:

Unit-1:Assignments on solving sets and modeling various functions

Unit-2:Exercises on solving differential equation and their application in economics

Unit-3:Board Presentation by students in solving the optimization problems related to economics

Unit-4:Task Based Learning (TBL) for solving and application of the linear program

models with economic examples

Unit-5:Group Projects on solving metric problems, submit report and make presentation.