Basic Mathematics for Economics

Course Code: IECO1C002T
Course Title: Basic Mathematics for Economics
Semester : I
Credits : 4

Rationale

The tremendous mathematical growth of economics over time has greatly benefited the subject's concision. The goal of this course is to provide students with the fundamental mathematical skills required to understand economics. The objective of this course is to apply various mathematical methods to economic problems and to provide students a basic understanding of how mathematics is used in economics.

Course Outline

Contents	No. of Lectures
Unit I: Set Theory, Relations and Functions Concept of Sets and its operations: Set Notation, Relationship between sets, operations on sets, Law of set operations; Relations and Functions: Ordered pairs, relations and functions; Types of Functions: Constant Functions, Polynomial functions, Rational Functions, Non algebric functions; Functions of Two or more independent variables; Levels of Generality; Value of function at a point; Limit and Continuity of a function	7
Unit II: Matrix Algebra-I Matrices: Elementary operations, Addition and subtraction of Matrices, Scalar Multiplication, Multiplication of Matrices, Commutative, Associative and Distributive Laws, Transpose of a Matrix, Determinant of a Matrix; Rank of a matrix; Matrix Inverse; Solution of simultaneous equations by Matrix Inverse Method and Cramer's Rule and its applications	7
Unit III: Matrix Algebra-II Matrices and Vectors: Vectors as special Matrices; Vector Operations: Multiplication of Vectors, Geometric interpretation of Vector, Vector Operations; Linear Dependence and Independence of Vectors; Characteristic roots and Eigen vectors; Cayley Hamilton Theorem	7
Unit IV: Comparative Statics and the Concept of Derivative Nature of Comparative Statics; Rate of Change and the Derivative; Derivative and the slope of a curve; Principles of Differentiation for a function of one variable: Constant Function rule, Power function rule, power function rule generalized; Rules of Differentiation involving two or more functions of the same variable: Sum-Difference rule, Product rule, Quotient Rule	7
Unit V:Derivatives Rules of Differentiation involving functions of different variables: Chain Rule, Inverse function rule; Derivatives of Parametric, Logarithmic and Exponential functions; Partial Differentiation; Total Differentiation; Derivatives and its Applications.	7

Course Outcomes

Upon successful completion of this course, candidates will be able to

- Apply mathematical techniques to economic problems.
- Use mathematical approaches to evaluate economic problems
- Learn the mathematical abilities required for economic analysis.
- Master the fundamental principles and tools of mathematics and apply them to crucial economic problems.
- Understand and grasp the rationale behind key mathematical assumptions used in economic modeling.

Text Books

1. Alpha C. Chiang and Kevin Wainwright (2005), *Fundamental Methods of Mathematical Economics*, 4th Edition, McGraw-Hill.
2. Sydsaeter, Knut., and Peter Hammond (2002) ,*Mathematics for Economic Analysis*, Pearson Education India, 1st edition.

Reference Books

1. Allen, R.G.D. (1967). *Mathematical Analysis for Economists*, Macmillan.
2. Simon, C. and L. Blume. (1994). *Mathematics for Economists*. Norton, London,
3. Edward T Dowling (2011):Introduction to Mathematical Economics, Schaum's Series.