

Mathematics for Economics

Course Code: *IECO2C0017*

Course Title : Mathematics for Economics

Semester : III

Credits : 4

Rationale

Since the discipline of economics has significantly developed in a mathematical frame during the last sixty years and helped the subject to become more concise. The objective of this course is to equip the students with basic mathematical tools for better understanding of economics. This course has been introduced to provide an insight into the importance of mathematical methods in economics and to apply a range of mathematical techniques to economic problems.

Course Outline

Contents	No. of Lectures
<p style="text-align: center;">Unit-I Differential Calculus</p> <p>Homogeneous Functions: Properties of Homogeneous Functions and Euler's Theorem; Maxima and Minima of functions of one and two variables; Constrained Maxima and Minima of functions of two variables; Economic applications of differentiation, partial differentiation and maxima and minima subject to constraints.</p>	10
<p style="text-align: center;">Unit-II Integral Calculus</p> <p>Rules of Integration: Integration by Substitutions: By Parts and By Partial Fractions; Indefinite and Definite integrals; Improper Integrals ; Application of Integrals in economics: Consumer Surplus and Producer Surplus; Domar Growth Model.</p>	10
<p style="text-align: center;">Unit-III Differential Equations</p> <p>Concepts, Solutions in case of Variable Separable, Homogeneous Differential Equation, Non-Homogeneous Differential Equations, Exact Differential Equations, Linear Differential Equation of first , Linear Differential Equation of Second Order with Constant Coefficients</p>	10
<p style="text-align: center;">Unit-IV Difference Equations</p> <p>Difference Equations: Order and Degree of Difference Equation, Linear Homogeneous Difference Equation with Constant Coefficients of First and Second Order, Solution of Non-Homogeneous Difference Equation of First Order; Applications: Differential and Difference Equations applied to market equilibrium; Cobweb model</p>	10
<p style="text-align: center;">Unit-V Programming and Input-Output Analysis</p> <p>Linear programming: Concept and formulation of LP problems, Solutions with Graphical and Simplex Method, Dual formulation and its interpretation; Application of LPP; Input-Output Analysis: Assumptions, Technological Coefficient Matrix, Open and Closed I-O Model, Hawkins Simon Conditions</p>	10

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.
- Use differential calculus to analyze economic functions, marginal analysis, and elasticity.
- Apply integral calculus to analyze cumulative economic processes, such as total cost and total revenue.
- Introduce basic concepts of differential equations and their applications in economic modeling, such as dynamic optimization and economic growth.
- 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 modelling.

Text Books

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

Reference Books

1. Allen, R.G.D. (1967): *Mathematical Analysis for Economists*, Macmillan.
2. Simon, C. and L. Blume, *Mathematics for Economists*, Norton, London, 1994
3. Kandoi, Balwant (2011): *Mathematics for Business & Economics with Applications* (Vol I), Himalya Publishing
4. Kandoi, Balwant (2011): *Mathematics for Business & Economics with Applications* (Vol II), Himalya Publishing