



OFFICE OF THE REGISTRAR :: DIBRUGARH UNIVERSITY :: DIBRUGARH

Ref. No. DU/DR-A/Eco.(Syllabus-modified)/2025/104

Date: 07.02.2025

NOTIFICATION

As recommended by the meeting of the Board of Studies (BoS) in Economics, Dibrugarh University held on 28.01.2025, it is for information of all concerned that a minor modification has been done in the course contents of the core course **Code: ECOC8: titled 'Intermediate Mathematical Methods for Economics'** offered in the 4th Semester under Four Year Under Graduate Programme (FYUGP) by removing the 5th Unit from the syllabus (at Page No. 57) already uploaded on the website.

This notification is issued under report to the next meetings of the Under Graduate Board (UGB) and Academic Council, Dibrugarh University.

The aforementioned modified syllabus is attached herewith.

Issued with due approval.

Assmoh
07/02/2025
Deputy Registrar (Academic) i/c
Dibrugarh University
gheeta

Copy forwarded for kind information and necessary action to:

1. The Hon'ble Vice-Chancellor, Dibrugarh University.
2. The Deans, Dibrugarh University.
3. The Registrar, Dibrugarh University.
4. The Heads / Chairpersons of the Teaching Departments / Centres of Studies, Dibrugarh University.
5. The Head, Department of Economics, Dibrugarh University.
6. The Principals of the affiliated / permitted Colleges of Dibrugarh University.
7. The Controller of Examinations i/c, Dibrugarh University.
8. The Joint / Deputy Controller of Examinations-'B', 'C' and 'A' Dibrugarh University.
9. The Programmer, Dibrugarh University, with a request to upload the Notification on the D.U. Website.
10. Files.

Assmoh
07/02/2025
Deputy Registrar (Academic) i/c
Dibrugarh University
gheeta

FOUR YEAR UNDERGRADUATE PROGRAMME IN ECONOMICS (NEP)
DETAILED SYLLABUS OF 4TH SEMESTER

Course Title	:	Intermediate Mathematical Methods for Economics
Course Code	:	ECOC8
Nature of the course	:	Major
Total Credits	:	04
Distribution of Marks:		60 (End-Sem.) + 40 (In-Sem.)

Course Description: This course is the second part of a compulsory two-course sequence. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general.

Course Objectives:

- To provide basic knowledge of difference equation and its economic application;
- To enable the learners to extend their knowledge of derivatives to functions of several variables as well as their applications;
- To foster a solid understanding of various optimisation techniques and their application in relevant economic fields.

Course Outcomes: After successful completion of this course students will be able to-

CO1: Understand and apply first-order difference equations to model and analyze economic phenomena.

LO1.1: Define and solve first-order difference equations.

LO1.2: Interpret the solutions of difference equations in economic contexts.

LO1.3: Apply difference equations to model economic dynamics, such as inventory control and market equilibrium.

LO1.4: Analyze the stability of economic models using difference equations.

CO2: Use partial and total differentiation to analyze and solve problems in economics, including production and consumer theory.

LO2.1: Perform partial and total differentiation of functions involving several variables.

LO2.2: Apply differentiation techniques to analyze indifference curves and derive expansion paths.

LO2.3: Evaluate production functions, including homogeneous functions, using Euler's Theorem.

LO2.4: Analyze and compare the properties of Cobb-Douglas and CES production functions.

CO3: Apply methods of unconstrained optimization to solve economic problems involving single and multiple variables.

LO3.1: Perform unconstrained optimization for functions of one variable and interpret economic applications.

LO3.2: Solve unconstrained optimization problems involving multiple variables.

LO3.3: Analyze economic scenarios such as discriminating monopoly and multiproduct monopoly using optimization techniques.

LO3.4: Interpret the results of optimization in the context of economic decision-making.

CO4: Use Lagrange multipliers to solve constrained optimization problems and apply these methods to consumer and producer equilibrium.

LO4.1: Explain the concept of constrained optimization and the role of Lagrange multipliers.

LO4.2: Apply Lagrange multipliers to solve optimization problems with equality constraints.

LO4.3: Analyze consumer equilibrium using constrained optimization techniques.

LO4.4: Apply constrained optimization to determine producer equilibrium and interpret the results.

Units		L	T	P	Total Hours
1.	Difference equation: First order Difference equation and its Economic Applications.	7	1		8
2.	Derivatives of Functions of several variables: Partial and Total differentiation and economic applications, Indifference curve analysis; Expansion Path, Production Function Analysis- Homogeneous Functions and Euler's Theorem; Cobb-Douglas Production Function and its Properties; CES Production Function and its properties.	16	3		19
3.	Unconstrained optimization: Unconstrained optimization with one variable and Economic Applications; Unconstrained optimization with more than one variable and Economic Applications- Discriminating Monopoly, multiproduct monopoly.	16	3		19
4.	Constrained optimization with equality constraints: Lagrange characterization using calculus; applications-consumer's equilibrium and producer's equilibrium.	12	2		14
Total		51	9		60

Where, L: Lectures T: Tutorials P: Practicals

MODES OF IN-SEMESTER ASSESSMENT: 40 Marks

- Two Internal Examinations - **20 Marks**
- Others (Any two) - **20 Marks**
 - Home assignment
 - Viva voce
 - Seminar
 - Group discussion
 - Quiz

Cognitive Mapping of COs with Bloom's Taxonomy:

Cognitive Knowledge Dimensions	Cognitive Process Dimensions					
	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual Knowledge	CO1					
Conceptual Knowledge	CO1	CO1, CO2, CO3, CO4	CO1, CO2, CO3, CO4	CO1, CO2, CO4		
Procedural Knowledge		CO1, CO2, CO3, CO4	CO1, CO2, CO3, CO4	CO3		
Metacognitive Knowledge					CO4	

Mapping of COs with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓	✓	✓	✓	✓		✓	✓	✓	
CO2	✓	✓	✓	✓	✓		✓	✓	✓	
CO3	✓	✓	✓	✓	✓		✓	✓	✓	
CO4	✓	✓	✓	✓	✓		✓	✓	✓	

Reading list:

- K. Sydsaeter and P. Hammond, *Mathematics for Economic Analysis*, Pearson EducationalAsia: Delhi, 2002.
- Chiang, A.C.: *Fundamental Methods of Mathematical Economics*, Fourth edition, McGraw Hill 2005.
- Hoy, M., J. Livernois, C. McKena, R. Rees, and T. Stengos: *Mathematics for Economics*, PHIPublishers.
- Barua, Srinath: *Basic Mathematics and Its Applications in Economics*, Second Edition, LaxmiPublications 2013.