National law university and judicial academy, assam

Programme: b.a. L.l.b.(hons)

Details of course offered

Odd semester – academic year: 2023-2024

Sl. No	Course code	Course title	L	T	P	Cr	Ch
1	BL701.2 economics (major,vii) seminar paper	Mathematical economics and its applications	4 Per week	1 Per week		4	

A. Code and title of the course: eco (major vii-i) – Mathematical economics and its applications

B. Course credit: 4 (total marks-200)

C. Medium of instruction: english

D. Course compiled by: dr. Dipakshi das

E. Course instructor: dr. Preeti chakravarthy

1. Course Objectives

The course Mathematical Economics and its Applications is so designed as to transmit the body of basic mathematics that enables the study of economic theories at the undergraduate level, specially the courses on microeconomic and macroeconomic theories. The mathematical techniques are applied in the economic models so as to understand the economic theory in general.

2. Teaching Methodology

The teaching methodology shall be participatory teaching with discussions on the topics included and connected. The students are informed in advance the topic for discussion and the topic of project / assignment they have to prepare. The students prepare their topics from the sources suggested to them. The students are also encouraged to do independent research on their respective assignments. In the classroom every student is required to present his/her topic and to have his/her doubt cleared through discussion. The teacher will be helping and guiding the students in their pursuits of legal learning. The teacher summarizes after the students have completed their discussion, and clarify the doubts, if any, and answer their queries.

3. Course Learning Outcomes

On completion of the Course the students are expected to understand the nuances of each module and thereafter they shall be in a position to understand and relate emerging topics in their field of study. They are also expected to develop keen interest in the topics as they are quite relevant in their practical aspects as well. The proper understanding of the modules shall help the students to analyze the following:

   i.   To provide a wider and deeper exposure to the calculus functions and their applications to the discipline of Economics.

   ii.   To help the students gain an understanding of how to solve mathematical problems that are common to economic modelling.

iii. To facilitate the ability of students to demonstrate the economic applications of differentiation and use it to formulate economic problems.

iv. To help in developing the skills to solve economic problems through a wide array of mathematical techniques.

4. Course Evaluation Method

The Course shall be assessed for 200 marks. The Evaluation scheme would be as follows:

Internal assessment: 70% (140 marks)

Practical Component: 30% (60 marks)

Sl. No.	Internal Assessment	
1.	Seminar Paper Write up	80 marks
2.	Final Presentation	50 marks
3.	Attendance in class	10 marks
	Practical Component	
4.	Work in Progress	30 marks
5.	Practical Assesment (Group Discussions/Peer teaching/etc)	30 marks

5. detailed structure of the course (specifying course modules and sub-modules)

MODULE I – Basic Concepts

Number System; Constant and Variables; Set and Operations; Domain and Range;

Limit and Continuity of a function; Equity and Identities.

MODULE II- Calculus and Integration

Differentiation- Function and Rules; Application in elasticity of Demand and Supply; Derivation of marginal Functions; Relationships among Total, Marginal and Average Functions,

Partial and Total Differentiation- Application to simple market model, national income model; Production Function and Euler's Theorem.

Integration- function and basic rules; derivation of total function; Definite Integral- application to consumers' and producers' surplus.

MODULE III- Matrix and Determinants

Matrix- types of matrices, matrix operations- addition, subtraction and multiplication.

Determinants- concepts, solution to simultaneous equation system, Cramer's rule, application to market model.

Game theory- concepts, two person zero-sum game, pay off matrix, simple and mixed strategy, saddle point solution, Prisoner's Dilemma.

MODULE IV- Linear Programming

Basic concepts, Primal and Dual, Basic Theorem of linear programming, Graphical and Simplex Method (two variable and two constraints only).

6. Prescribed Readings

- Baruah, S. N. (2010). Basic Mathematics and its Applications in Economics, Macmillan

- Chiang A. C. and K. Wainwright, Fundamental Methods of Mathematical Economics, McGraw Hill International Edition.

- K. Sydsaester and P. Hammond, Mathematics for Economic Analysis, Pearson Educational Asia: Delhi, 2002.

- Gupta, S. P. (2012). Statistical Methods. S. Chand.

- John E. Freund (1992). Mathematical Statistics, Prentice hall.