SD COLLEGE HOSHIARPUR

DEPARTMENT OF ECONOMICS

LECTURE PLAN FOR THE SESSION 2021-2022

Class	**B.A-II (SEMESTER- 4)**
Subject Name and Code	**QUANTITATIVE METHODS**
Max. Marks and duration of exam.	100 (Theory :90, Internal Assessment:10), 3 hours
Duration of lecture	45 min per day
No. of lectures delivered per week	6 lectures
Submitted by	Dr. Palwinder Kaur, Department of Economics

COURSE OBJECTIVE:

The objective of the course is to train the students in the use of basic mathematical and statistical tools in analyzing various economic phenomena. It deals with the design of how data is presented, the analysis of the data, and the drawing of conclusions from the data. The course aims to improve decision-making accuracy of the students and enabling them to test new ideas.

UNIT-I

Topic	Teaching Points	Specific Objectives	Methods, Approaches and Techniques	Resources & Reference Books:

Elementary Idea of Sets	• Meaning • Types • Operations on Sets • Applications	The students will learn the basic concepts of SETS and their economic applications	Class room teaching with examples. Class Test PPT	1. Archibald, G. C. and Lipsey, R. G.: An Introduction to a Mathematical Treatment of Economics, English Language Book Society, Weidenfeld and Nicolson. 2. Gupta, S. C. : Fundamentals of Statistics, Mumbai, Himalaya Publishing House. 3. Sanchati, D. C. & Kapoor, V. K.: Business Mathematics, Sultan Chand &
Functions	• Meaning • Types • Numericals on functions	To enable the students to understand various variables and their functional relationship in real life.	Lecture method of classroom teaching	

Simple Derivatives	• Meaning • Different methods • Applications of derivatives	To make the students aware of the use of derivatives in economics	Class room teaching with examples Class Test	Sons, New Delhi. 4. Jain, T.R., Quantitative Methods, V.K. Global Publications
Partial Derivatives	• Formulae and Numericals	To make the students aware of the use of derivatives in economics and also to enable them to understand the relative importance of different variables	Class room teaching with examples	
Maxima and Minima of functions of one variable only	• Meaning • Their Applications of Micro and Macro Economics	The students will understand the real life applications of the concept of maxima and minima	Practicals/ Numericals will be solved in the class	
UNIT-II				

Matrices	• Definition and Types • Operations (Sum, Difference, Product and Transpose), • Adjoint and Inverse of a matrix (upto 3 · 3) • Solution of Equations (upto 3) by Matrix Methods • Crammer's rule	To equip the students with the knowledge of matrices while solving the real problems of the economy	Practicals/ Numericals will be solved in the class	1. Archibald, G. C. and Lipsey, R. G.: An Introduction to a Mathematical Treatment of Economics, English Language Book Society, Weidenfeld and Nicolson. 2. Gupta, S. C. : Fundamentals of Statistics, Mumbai, Himalaya Publishing House.
Measures of Central Tendency	• Mean • Median • Partition Values • Mode • Measures of Dispersion	The students will understand the importance of averages in real life	Practicals/ Numericals will be solved in the class	3. Sanchati, D. C. & Kapoor, V. K.: Business Mathematics, Sultan Chand & Sons, New Delhi. 4. Jain, T.R., Quantitative Methods, V.K.

	• Skewness			Global Publications
UNIT-III				
Correlation Analysis	• Karl Pearson's (except grouped data) • Spearman's formula	To help the students to understand the association of different variables.	Practicals/ Numericals will be solved in the class Real Life Examples	1. Archibald, G. C. and Lipsey, R. G.: An Introduction to a Mathematical Treatment of Economics, English Language Book Society, Weidenfeld and Nicolson.
Simple Regression Analysis	• Meaning • Types • Methods • Numericals	To help the students to learn the cause and effect relationship between/ among varibles	Practicals/ Numericals will be solved in the class	2. Gupta, S. C. : Fundamentals of Statistics, Mumbai, Himalaya Publishing House.
Interpolation	• Binomial Expansion • Newton's (Advancing Difference	It will help the students to complete the series if any values are missing in the beginning, middle or in the end of the series. It will help for	Practicals/ Numericals will be solved in the class	3. Sanchati, D. C. & Kapoor, V. K.: Business

	Method) • Lagrange's Method	forecasting also.		Mathematics, Sultan Chand & Sons, New Delhi. 4. Jain, T.R., Quantitative Methods, V.K. Global Publications
UNIT-IV				
Index Numbers	• Concepts • Problems • Importance • Simple Index Number : Laspeyre's and Fisher's Index Numbers only (among weighted index numbers), Reversibility Tests	These indices will be helpful to know the status of the economy	Practicals/ Numericals will be solved in the class Class Test	1. Archibald, G. C. and Lipsey, R. G.: An Introduction to a Mathematical Treatment of Economics, English Language Book Society, Weidenfeld and Nicolson. 2. Gupta, S. C. : Fundamentals of Statistics,

| Time Series Analysis | • Meaning

• Types

• Methods | It will help to gain the in-depth knowledge on time series data analysis by different methods | Practicals/ Numericals will be solved in the class

PPT | Mumbai, Himalaya Publishing House.

3. Sanchati, D. C. & Kapoor, V. K.: Business Mathematics, Sultan Chand & Sons, New Delhi.

4. Jain, T.R., Quantitative Methods, V.K. Global Publications |

QUESTION BANK

Short Answer Type

- Explain in detail various set operations.
- A=[9,4,2]
  B=[2,5,10]
  Find out AUB, A-B and B-A?
- Find dy/dx
  Given $y = 3x^2/5x+2$

$y = \log(x^3\, 2x^{2)}$

$y = x^x$

- Explain in detail applications of derivatives in economics.
- What are matrices? explain types of matrices.
- If A = -4 2 1   AND   B = -6 1

    -6 8 6   9 2

                                7 2

Show that (AB)' =B'A'

Long Answer Type

- What do you mean by mean? Explain in detail properties of mean.
- Mean wages of workers of Factory 1 and Factory are 200 and 250 respectively. Number of workers in Factory1 and Factory 2 are 40 and 50 respectively. Find out the combined mean?
- Find out mean weekly wages:

  Weekly wages (Rs.): under20 20-24 24-30 30-36 36-48 48or above
  No. of workers: 86   12   48   80   30   8.

- Find out $M, Q_1, Q_3, D_7, D_9, P_{20}, P_{87}$
  S.NO.: 1   2   3   4   5   6   7   8   9   10
  X :   10 12 20 28 30 38 44 46 52 54
- Find out mode with the help of grouping table method

Weights	No.of persons
0-10	3
10-20	6

20-30	20
30-40	32
40-50	33
50-60	17
60-70	8
70-80	3

- What is correlation? Explain types of correlation?
- Find out coefficient correlation using Karl Pearson's methos:

  X : 5 10 15 20 25 30 35
  Y : 2 4 7 9 8 10 9
- Find out regression equation of Y on X and X on Y
   X : 10 15 16 17 22 25 26
   Y : 1 3 5 8 12 4 6
- Explain tests of consistency for Laspeyre's, Pasche's, Bowley's and Kelly's and Fisher's index methods. Why Fisher's method is known as ideal index number?
- What do you mean by Time series? Explain various components of Time Series?
- To the following data fit a linear trend by least square method:
  Year :   1975   76   77   78   79   80   81
  Production: 20   25   28   30   32   35   40