KU3DSCECO202: BASIC ANALYTICAL TOOLS FOR ECONOMICS

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
III	DSC-Major	200-299	KU3DSCECO202	4	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course aims to equip students with the essential mathematical and statistical tools and techniques for understanding and analysing economic phenomena. The course familiarizes with uses of mathematics and statistics in economics. The course explores the concepts of data, variables and different types of surveys. The course covers topics such as measures of central tendencies and dispersion. Moreover, the course explores the topics of sets, relations and functions.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Describe the uses and limitations of mathematics and statistics in economics	R
2	Understand the fundamental mathematical and statistical concepts	U
3	Describe the measures of central tendency and variability	R, U
4	Apply the relevant formula for finding central tendency and variability and evaluate data.	U, A
5	Describe the functional association in mathematical form and present it in graphical form.	R, A

**Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)*

Mapping of Course Outcomes to PSOs

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1		✓					
CO 2			✓				
CO 3		✓	✓				
CO 4	✓						✓
CO 5	✓	✓					

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1	**INTRODUCTORY STATISTICS**		**7**
	1	Meaning and definition of statistics- Descriptive and inferential statistics- Role and functions of statistics- Limitations.	2
	2	Quantitative variable- Continuous and discrete variables- Qualitative variable- Nominal, ordinal, interval and ratio levels of measurement.	1
	3	Data-Types of data- Primary and secondary data with their merits and demerits- Techniques of primary data collection- Sources of secondary data.	2
	4	Population- sample- Sample size- Census vs sample surveys- Need for sampling	2
2	**SUMMARISING AND DESCRIBING DATA**		**20**
	1	Frequency distribution - Procedure for construction frequency distribution- Relative frequency distribution - Cumulative frequency distribution - Constructing discrete and continuous frequency distribution.	4
	2	Graphic and diagrammatic presentation of data - Bar diagram, Pareto chart, pie chart, histogram, frequency polygon and ogives.	4
	3	Meaning and definition of central tendency/average- Requisites for an ideal measure of central tendency- Properties and computation of arithmetic mean, median and mode- Relationship between mean, median and mode- Geometric and harmonic mean-Partition values: Quartiles, deciles and percentiles.	7
	4	Meaning and definition of dispersion-Characteristics of an ideal measure of dispersion- Properties and computation of absolute and relative measures of range, quartile deviation, mean deviation and standard deviation- Variance- Lorenz curve and Gini coefficient.	5
3	**MATHEMATICS AND ECONOMICS**		**8**
	1	Importance of mathematics in economics-Mathematical economics and non-mathematical economics- Limitations of mathematical economics.	2

	2	Variables, constants and parameters- Equations and identities.	1
	3	Introduction to algebra: Types of numbers- Basic operations on numbers- Representation -Evaluation- Simplification (Addition, subtraction, multiplication, factorisation and division) –Solving linear and quadratic equations.	5
4	**FUNCTIONS AND GRAPHS**		**15**
	1	Meaning and representation of set- Types and operations on set- Venn diagram- Ordered pairs- Cartesian product of two sets.	4
	2	Relations and functions- Domain and range- Evaluating functions- Odd, even, single variable, multi-variable, increasing, decreasing, monotonic, convex and concave functions - Linear, quadratic, cubic, rational, exponential and logarithmic function and their graphs.	6
	3	Economic functions- Demand, supply, utility, production, cost, revenue, profit and consumption.	2
	4	Applications of functional equations- Equilibrium, determining cost, revenue and profit.	3
5	**TEACHER SPECIFIC MODULE**		**10**
	Directions: Skewness and Kurtosis		
	This module would be preferably based on the theoretical understanding and works on Skewness and Kurtosis		10

Essential Readings:

4. Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cocharan, J. J. (2018). Statistics for business & economics. Cengage.
5. Bradley, T., & Patton, P. (2002). *Essential mathematics for economics and business*. John Wiley & Sons.
6. Chiang, A. C., & Wainwright, K. (2013). *Fundamental methods of mathematical economics*. McGraw Hill.
7. Gupta, S. C., & Kapoor, V. K. (2020). Fundamentals of mathematical statistics. Sultan Chand & Sons.
8. Hooda, R. P. (2013). *Statistics for business and economics*. Vikas Publishing House.
9. Rosser, M., & Lis, P. (2016). *Basic mathematics for economists*. Routledge.
10. Sydsaeter, K., & Hammond, P. (2016). *Essential mathematics for economic analysis*. Pearson.
11. Whitte, R. S., & Whitte, J. S. (2017). Statistics. Wiley.

Reference Distribution:

Module	Unit	Reference No.	Remarks
1	1	Essential readings 4, 5 and 8	
	2	Essential readings 1and 8	
	3	Essential readings 5	
	4	Essential readings 5 and 8	
2	1	Essential readings 5 and 8	
	2	Essential readings 5 and 8	
	3	Essential readings 5 and 8	
	4	Essential readings 5 and 8	

3	1	Essential readings 3	
	2	Essential readings 3	
	3	Essential readings 3, 6 and 7	
4	1	Essential readings 3	
	2	Essential readings 3 and 7	
	3	Essential readings 2	
	4	Essential readings 3	
5		Essential readings 4, 5 and 8	preferably

Suggested Readings:

5. Baruah, S. (2011). Basic mathematics & its application in economics. Macmillan.
6. Doane, D. P., & Seward, L. E. (2022). Applied statistics in business and economics. McGraw Hill.
7. Freedman, D., Pisani, R., & Purves, R. (2007). Statistics. W.W. Norton & Company.
8. Gupta, S. C., & Kapoor, V. K. (2018). Fundamentals of applied statistics. Sultan Chand & Sons.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper- 1	6
b)	Test Paper-2	6
c)	Assignment	9
d)	Seminar	5
e)	Book/ Article Review	-
f)	Viva-Voce	4
g)	Field Report	-
Total		**100**