



DEPARTMENT OF MATHEMATICS

Semester: III

Integrated M.Sc. Mathematics
Subject :060090306 GE3 Basics of Statistics

Academic Year: 2019-20

Teaching Schedule

Course Objectives: To acquaint students with various statistical data analysis tools. Demonstrate the ability to apply fundamental concepts of statistical data analysis.

Course outcomes: Upon completion of the course, students shall be able to

C01: interpret measures of central tendency, dispersion and association.

C02: do the basic principles underlying survey design and estimation.

C03: apply discrete and continuous probability distributions to various business problems.

C04: use methods for designing and selecting a sample from a population.

C05: identify the appropriate nonparametric hypothesis testing procedure based on type of outcome variable and number of samples

C06: obtain the theoretical and practical knowledge on the analysis of non-parametric tests.

Unit	Sub Unit	No. of Lect.(s)	Topics	Reference Chapter/ Additional Reading	Teaching Methodology to be used	Active Learning Activities	Evaluation parameter
Measure of Central Value and Dispersion [15 hours]							
1	1.1	4	Measures of Central Tendency - Mean, Median, Mode, Harmonic mean and Geometric mean	Ch# 4, 5 P.N. Arora, Sumeet Arora, S. Arora, Comprehensive Statistical Method	PPT, Chalk& Talk	For Slow Learner: Students must solve some examples given by teacher after completion of unit.	Presentation, Assignment 1 Unit Test 1 Internal Exam
	1.2	4	Merits, Limitations and Suitability of averages.				
	1.3	4	Measures of Dispersion: Meaning and Significance				





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	1.4	3	Absolute and Relative measures of dispersion			using central value and dispersion	
Probability and Probability Distribution [15 hours]							
2	2.1	4	Definition, Theorems of addition, multiplication, Conditional probability	Ch# 11, 12, 13 P.N. Arora, Sumeet Arora, S. Arora, Comprehensive Statistical Method	PPT, Chalk& Talk	For Slow Learner: Students must solve some examples given by teacher after completion of unit. For Advanced Learner: Students will be able to recognize that the how to analyse data using different distribution	Presentation, Assignment 2 Unit Test 1.2 Internal Exam
	2.2	4	Random variable- discrete and continuous				
	2.3	4	Meaning, Characteristics of Binomial distribution				
	2.4	3	Poisson & Normal distribution, Central limit theorem.				
Sampling Techniques [14 hours]							
3	3.1	3	Probabilistic Sampling: Simple random sampling	Ch# 15 P.N. Arora, Sumeet Arora, S. Arora, Comprehensive Statistical Method	PPT, Chalk& Talk	For Slow Learner: Students must solve some examples given by teacher after completion of unit. For Advanced Learner: Students will be able to implement various sampling techniques to analyse data.	Presentation, Assignment 2 Unit Test 2 Internal Exam
	3.2	3	Systematic & Stratified sampling, Cluster sampling				
	3.3	4	Non-Probabilistic Sampling: Contingent method, Purposive				
	3.4	4	Expert sampling, Interview, Observation, Group discussion, Ethnography				
Parametric and Non-Parametric tests [16 hours]							
4	4.1	4	Large Sample Test: Z-test: Mean, Standard deviation and proportion for one sample and two samples	Ch# 17, 18, 19 P.N. Arora, Sumeet Arora, S. Arora, Comprehensive	PPT, Chalk& Talk	For Slow Learner: Students must solve some examples given by teacher after completion of unit.	Presentation, Assignment 4 Internal Exam





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	4.2	4	Small Sample Test: t-test: One sample and two samples mean, F-test: Two samples variance	Statistical Method		For Advanced Learner: Students will able to check the data by hypothesis testing to predict future.
	4.3	4	Hypothesis testing for correlation and regression			
	4.4	4	χ^2 - test and Goodness of Fit, Spearman's rank correlation test, Mann-Whitney U-test, Kruskal-Wallis test and Wilcoxon signed test			

Text book:

1. P.N. Arora, Sumeet Arora, S. Arora, Comprehensive Statistical Method, S. Chand & Company Ltd. 2008.

Reference books:

1. S.P. Gupta (S.P.): Statistical Methods, Sultan Chand & Sons, 34th Edition.
2. G.C.Beri, Business Statistics, New Delhi: Tata McGraw Hill Education Private limited, 2011.

Course Objectives and Course Outcomes Mapping:

- To acquaint students with various statistical data analysis tools.CO1, CO2, CO3, CO4
- Demonstrate the ability to apply fundamental concepts of statistical data analysis. CO5, CO6





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Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcomes					
		C01	C02	C03	C04	C05	C06
1	Measure of Central Value & Dispersion	✓					
2	Probability and Probability Distribution		✓	✓			
3	Sampling Techniques		✓		✓		
4	Parametric and Non-Parametric tests					✓	✓

Programme Outcomes (PO)

PO1: Knowledge

Provides knowledge about the fundamentals of pure, applied and computing mathematics and its applications to students that creates the opportunities in industries and research centers.

PO2: Core Competence

Creates competency in science and mathematics to formulate, analyses and solve problem and/or also to pursue advanced study or research.

PO3: Breadth

Trains students having good knowledge in unearth core of academia and industry by the roots of mathematics.

PO4: Evaluation

Imparts in students to raise trial and error-based curiosity and problem-solving functionality with research based advanced tutorial for higher level decision makings tools.





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Programme Outcomes and Course Outcomes mapping:

Programme Outcomes	Course outcomes					
	C01	C02	C03	C04	C05	C06
P01	✓		✓	✓		✓
P02		✓		✓		
P03	✓	✓				
P04				✓	✓	✓

