



University of Kerala

Discipline	STATISTICS				
Course Code	UK1DSCSTA109				
Course Title	DESCRIPTIVE STATISTICS AND PROBABILITY				
Type of Course	DSC				
Semester	I				
Academic Level	100 – 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	4	3 hours	-	2 hours	5
Pre-requisites					

COURSE OUTCOMES

Up on Completion of the course, students should be able to:		Cognitive level	PSO addressed
CO1	Create data analysis report about its middle values, spread, and overall shape.	Create	PSO-1, 2
CO2	Explain the concepts of random experiments, sample space and different types of events and Calculate the probabilities of events using classical, statistical approaches	Evaluate	PSO-1,2
CO3	Determine conditional probability and apply concepts of statistical independence and multiplication theorem and Use Bayes' theorem to evaluate posterior probabilities	Analyse	PSO-1,2,3
CO4	Explain the concept of random variables and Illustrate random variables and its probability distributions	Analyse	PSO-1,

COURSE CONTENT

Module	Content	Hrs
I	Descriptive Statistics	13
	Descriptive Statistics: Measures of Central Tendency- Mean, Median, Mode, GM, HM (Concept and Numerical Problems). Measures of Dispersion – Range, MD, QD, SD (Concept and numerical problems), Coefficient of Variation, Raw and central Moments (first four moments and their relationship without proof – Concepts only, numerical problems for raw data), Measures of Skewness and Kurtosis (Concepts only, numerical problems for raw data).	
II	Introduction to Probability	12
	Random experiments - Sample Space, Sample point, Events-algebra of events, equally likely, mutually exclusive and exhaustive events (Concept only). Probability: Statistical regularity, frequency definition, classical approach (Definition and numerical problems), Axiomatic approach, Probability space, Addition theorem – two and three events (Statement of results- no proof needed, numerical problems).	
III	Conditional probability	10
	Conditional probability: Definition, Multiplication theorem, independence of	

	two and three events, compound probability, marginal probability, Bayes' theorem and its applications. (Concepts and statement of results, no proofs needed, numerical problems).	
IV	Random variables	10
	Random variables – definition, discrete and continuous random variables, probability mass function and probability density function, distribution function and their properties (No proof needed, only numerical problems).	
V	Practicum	30
	Practical based on Modules I to be done using R	

PRACTICAL/LABWORK**List of Practical worksheet**

1. Measures of Central tendency.
2. Measures of Dispersion
3. Skewness and Kurtosis

REFERENCES

1. Agarwal, B.L. (2006). Basic Statistics. 4th Edition, New Age international (P) Ltd., New Delhi.
2. Gupta S. P. (2004). Statistical Methods. Sultan Chand & Sons, New Delhi.
3. Gupta, S. C., and Kapoor, V. K. (1994). Fundamental of Mathematical Statistics. Sultan Chand & Sons, New Delhi.
4. Kenny J. F (1947). Mathematics of Statistics Part One. 2nd Edition, D. Van Nostard Company, New Delhi-1.
5. Kenny J. F & Keeping E. S (1964). Mathematics of Statistics –Part Two. 2nd Edition, D. Van Nostard Company, New Delhi-1.
6. Mukhopadhyay, P. (1996). Mathematical Statistics. New Central Book Agency (P) Ltd, Calcutta.

Name of the Course: DESCRIPTIVE STATISTICS AND PROBABILITY**Credits: 3:0:1 (Lecture:Tutorial:Practical)**

CO No.	CO	PO/PS O	Cognitive Level	Knowledge Category	Lecture (L)	Practical (P)
CO1	Create data analysis report about its middle values, spread, and overall shape.	PSO-1, 2 PO 1	Create	F, C	L	
CO2	Explain the concepts of random experiments, sample space and different types of events and Calculate the probabilities of events using classical, statistical approaches	PSO-1,2 PO 1,2	Evaluate	F,C	L	

CO3	Determine conditional probability and apply concepts of statistical independence and multiplication theorem and Use Bayes' theorem to evaluate posterior probabilities	PSO-1,2,3,4 PO 1,7	Analyse	C,P	L	P
CO4	Explain the concept of random variables and Illustrate random variables and its probability distributions	PSO-1,2 PO 1,2	Analyse	C	L	

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with POs :

	PS O 1	P S O 2	PS O 3	PS O 4	PS O 5	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	1	2				1							
CO 2	1	2				1	2				2	1	
CO 3	2	1	2	1		2						1	
CO 4	2	2				1	2						

Assessment Rubrics:

- Quiz / Assignment/ Discussion / Seminar
- Internal Examination
- Practical Evaluation
- End Semester Examinations

Mapping of COs to Assessment Rubrics :

	Internal Exam	Quiz / Assignment Discussion / Seminar	Practical Evaluation	End Semester Exam
CO 1	✓	✓		✓
CO 2	✓	✓		✓
CO 3	✓	✓	✓	✓
CO 4	✓	✓		✓