

Programme: B. Sc.(Hons.) Class: B.Sc.		Year: IV	Semester: VII	
Subject: Mathematics				
Course Code:		Course Title: Mathematical Statistics		
Course Outcome	<p>CO1: Mathematical Statistics is a basic course in almost all branches of science. The objective of this course is to introduce a student to the basics of probability and statistics with some of its applications.</p> <p>CO2: After completing this course, a student will have the knowledge of probability and statistics, its scope and importance in various fields.</p> <p>CO3: The student will use this knowledge in computer science, finance mathematics, industrial mathematics and bio mathematics. After completion of this course students appreciate its interdisciplinary nature</p>			
Unit No.	Course Content			Hours
I	Random experiment, sample space and events, algebra of events. Definitions of Probability: Classical, statistical and axiomatic approaches, illustrations and applications, Addition rule, Conditional probability, independence of events and multiplication rule, Total probability rule, Bayes' theorem with applications.			12
II	Definitions of discrete and continuous random variables, Distribution function, probability mass and density functions – properties and illustrations, Expectation of a random variable and rules of expectation and related results, Probability generating function, Moments and moment generating function – properties and uses, Bernoulli's Distribution, Binomial Distribution, Poisson distribution (their density functions, mean, variance, moments up to fourth order)			12
III	Normal distribution, Uniform & Exponential distribution, sampling, types of Sampling, Test the significance, critical reason and level of significance, Null hypothesis, Test of hypothesis, Testing the significance of sample mean and difference between means of two samples.			12
IV	Pt. Estimation, Interval Estimation, Methods of Estimation, Max Likelihood method, Method of moments, Unbiasedness, Efficiency, Consistency, Sufficiency.			12
V	Curve Fitting, methods of Least square, Simple linear regression, Correlation, Multiple correlation.			12
Suggested Readings:				
<ol style="list-style-type: none"> 1. Miller & Freund: Probability and Statistics, Prentice Hall 2. Gupta & Kapoor: Probability and Statistics, Sultan. Chand & Sons 3. M.R. Spiegel: Theory & problems of Probability, Schaum's Outline Series 4. Ray & Sharma, Mathematical Statistics, Ram Prasad Publication 5. S Ross: A First Course in Probability, Prentice Hall. <ol style="list-style-type: none"> 1. Suggested digital platform: NPTEL/SWAYAM/MOOCs 				

Mapping of course outcomes with program outcomes & program specific outcomes

CO's No.	PO1	PO2	PO3	PO4	PO5	PS01	PS02	PS03	PS04
CO1	3	3	2	2	2	2	1	1	1
CO2	3	3	3	2	2	3	2	1	2
CO3	3	2	2	2	1	2	1	1	2