22MYBO8– PROBABILITY AND STATISTICS				
	L	**T**	**P**	**C**
	3	I	0	4

PRE-REQUISITE : NIL

Course Objective:	• To understand the mathematical concept of probability and random variable in various distributions. • To understand the concepts of testing the hypothesis of large and small samples and statistical quality control.

Course Outcomes The Student will be able to		**Cognitive Level**	**Weightage of COs in End Semester Examination**
CO1	Apply the axioms of probability and the moments of discrete and continuous random variables to engineering problems.	Ap	20%
CO2	Solve the concepts of discrete probability distributions including requirements of mean and variance fordecision making in algorithms.	Ap	20%
CO3	Determine the correlation and linear regression with respect to random variables in data science.	An	20%
CO4	Analyze large and small sample tests to perform non-parametric tests in machine learning and quality control.	An	40%
CO5	Demonstrate the statistical methods to solve the real life problems by using modern techniques.	Ap	Internal Assessment

UNIT I -PROBABILITY AND RANDOM VARIABLES	**(9+3)**
Probability: Random variable – Probability mass function – Probability density functions -Properties-Moments-Moments generating functions.	

UNIT II - STANDARD DISTRIBUTIONS	**(9+3)**
Discrete distributions: Binomial, Poisson and Geometric- Continuous distribution: Uniform, Exponential and normal distributions.	

UNIT III- TWO-DIMENSIONAL RANDOM VARIABLES	**(9+3)**
Joint distributions-Marginal and conditional distributions-Covariance-Correlation and linear regression.	

UNIT IV –ESTIMATION THEORY AND NON-PARAMETRIC TESTS	**(9+3)**
Differences between means, variations and ratio of two variances- Non-parametric Tests: Introduction-The sign test-The signed – Rank test- Rank-sum tests-The U test-The H test.	

UNIT V – STATISTICAL QUALITY CONTROL	**(9+3)**
Control charts for measurements ($\overline{X}$ and R-charts)-Control charts for attributes(p,c and np charts)-Tolerance limits-Acceptance sampling.	

	TOTAL (L:45+T:15) : 60 PERIODS

TEXT BOOKS:
1. Veerarajan.T, "Probability, Statistics and Random Processes with Queuing Theory and Queuing Networks",4ed. ,Tata McGraw-Hill, New Delhi 2018.
2. S.C.Gupta and V.K.Kapoor, "Fundamentals of Mathematical Statistics", 12th edition,Sultan Chand & Sons, New   Delhi- 2020.
3. Johnson.R.A., Miller.I.RandFreud.J.E,"Miller and Freund's Probability and Statistics for Engineers",Pearson Education,Asia,9 th edition,2016.

RsEFERENCES:
1. Allen, 0. Arnold, "Probability, Statistics and Queuing Theory with Computer Applications ", 2nd ed., Elsevier, New Delhi, 1990.
2. Taha, H.A., "Operations Research -An Introduction", 8th ed., Pearson Education, New Delhi, 2008.
3. Trivedi, S.K, "Probability and Statistics with Reliability, Queuing and Computer Science applications", 2ndEd. John Wiley & Sons, New Delhi, 2016.

Mapping of COs with POs / PSOs

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3													
2	3												2	
3		2											2	2
4		2											2	2
5	3				2				2			2		2
CO (W.A)	3	2			2				2			2	2	2