PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY
(Autonomous)
KANURU, VIJAYAWADA-520007

I B.Tech – II Sem CSE (DATA SCIENCE)
PROBABILITY AND STATISTICS

Course Code	20BS1204	**Year**	I	**Semester**	II
Course Category	Basic Science	**Branch**	CSE(Data Science)	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Nil
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Understand the basic concepts of probability and statistics.	**L2**
CO2	Calculate the measures of central tendencies, correlation and regression to the given data and apply appropriate probability distributions to the given problem	**L3**
CO3	Apply the concepts of testing hypothesis for large and small samples	**L3**
CO4	Connect the concepts of probability, correlation and regression to real life problems	**L4**
CO5	Identify appropriate test statistic to test given hypothesis for statistical decision	**L4**
CO6	Apply the concepts of probability and statistics to the given data and submit the report.	**L3**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1													1	1
CO2	3								2	2			1	1
CO3	3								2	2			1	1
CO4		3											1	1
CO5		3											1	1
CO6	3								2	2			1	1

Syllabus		
Unit No.	**Contents**	**Mapped CO's**
I	**Measures of Central Tendency and Probability:** **Measures of central tendency** : Mean, Median, Mode **Probability**: Probability axioms, addition law and multiplicative law of probability, conditional probability, Baye's theorem (without proof).	**CO1,CO2, CO4,CO6**
II	**Random Variable and Probability Distributions:** Random variables (discrete and continuous), probability density functions, probability distribution - Binomial, Poisson and normal distribution-their properties (mathematical expectation and variance).	**CO1,CO2, CO4,CO6**
III	**Correlation, Regression:** Correlation, correlation coefficient, rank correlation, regression, lines of regression, regression coefficients, principle of least squares and curve fitting (straight Line, parabola and exponential curves).	**CO1,CO2, CO4,CO6**
IV	**Testing of Hypothesis and Large Sample Tests:** Formulation of null hypothesis, alternative hypothesis, the critical region, two types of errors, level of significance. **Large Sample Tests**: Test for single proportion, difference of proportions, test for single mean and difference of means. Confidence interval for parameters in one sample and two sample problems	**CO1,CO3 CO5,CO6**
V	**Small Sample Tests:** Student t-distribution (test for single mean, two means and paired t-test), testing of equality of variances (F-test), $\chi 2$ - test for goodness of fit, $\chi 2$- test for independence of attributes.	**CO1,CO3, CO5,CO6**

Learning Resources
Text Books:
1. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.   2. Dr.T.K.V. Iyengar, Dr.B.Krishna Gandhi, S. Ranganatham, Dr. M.V.S.S.N. Prasad, Probability & Statistics, Publications: S.Chand, 4th Revised Edition, 2012.
Reference Books:
1. S. Ross, A First Course in Probability, Pearson Education India, 2002.   2. Miller and Freunds, Probability and Statistics for Engineers,7/e, Pearson, 2008
e- Resources & other digital material:
1. https://nptel.ac.in/courses/111/106/111106150/   2. https://nptel.ac.in/courses/111105035   3. http://202.53.81.118/ -> PVPSIT FED-Moodle