Probability and Statistics

Course Code	20BS1204	**Year**	I	**Semester**	II
Course Category	Basic Science	**Branch**	CSE	**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.	Syllabus	Mapped CO's
1	**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
2	**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
3	**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
4	**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
5	**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