GURU TEGH BAHADUR INSTITUTE OF TECHNOLOGY NEW DELHI

Lesson Plan for Probability,Statistic and Linear Algebra

Paper Code-AIML/DS-209

Course Name: B.Tech. Semester: 3rd   Paper Code-AIML/DS-209

S.No	Topic Details	No of Hours	Reference/text book
First Term			
1.	**Unit-I:** **Introduction Basics: Probability and Statistical models, Sample Spaces and Events,Counting** **Techniques,Interpretations and Axioms of Probability, Unions of Events and Addition Rules,Conditional Probability, Intersections of Events and Multiplication and Total Probability Rules, Independence, Bayes' Theorem,** Probability-Probability spaces, conditional probability, independence; Discrete random variables, continuous random variables and their properties, distribution functions and densities, exponential and gamma densities. Independent random variables, the multinomial distribution, Chebyshev's Inequality, Bayes' rule.	6 3	T1, T2
2.	**UNIT-II :** Basic Statistics-Measures of Central tendency: Moments, skewness and Kurtosis Probability distributions: Binomial, Poisson and Normal- evaluation of statistical parameters for these three distributions, Correlation and regression-Rank correlation	7 2	T2,T3

3.	**UNIT-III** Applied Statistics- Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Test of significance- large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations.	4 5	T1,T2,T3
4.	**Unit-4** Linear Algebra- Cramer's rule, Singular Value decomposition, Euclidian vector spaces, Projection. Hermitian and Unitary Matrix, Gram -Schmidt orthogonalization, LU- decomposition.	9	R1

Text Books:

1. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall 2003.
2. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.
3. W. Feller. An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.

Reference Books:

1. N.P. Bali and Manish Goyal, A textbook of Engineering Mathematics, Laxmi Publications