MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

COURSE CONTENT:

UNIT	CONTENT	No. of Hrs.
I	**Probability and Random Variables:** introduction, basic concepts–sample space, events, counting sample space, conditional probability and independence, permutations and combinations, rules of probability, bayes' theorem. random variables – concept of random variable, percentiles, probability distributions – discrete & continuous, mean, variance and covariance of random variables, chebychev's inequality.	6
II	**Standard Probability Distributions:** Discrete distributions - uniform, binomial, multinomial, hyper geometric, poisson, negative binomial, poission; continuous distributions - normal, exponential, gamma, weibull and beta distributions and their properties -function of random variables.	6
III	**Sampling Distributions:** Random sampling, sampling distributions of means, estimation, properties of point estimators, confidence interval, maximum likelihood and bayes estimators, prediction intervals.	6
IV	**Testing of Hypothesis:** Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using normal, t, Chi-square and F distributions, tests for independence of attributes and goodness of fit. **Linear Correlation and Regression Analysis:** Introduction, linear regression model, regression coefficient, lines of correlation, rank correlation	6

Text Books:
1. Gupta, S.C, and Kapur, J.N., *"Fundamentals of Mathematical Statistics"*, Sultan Chand, Ninth Edition, New Delhi,1996.
2. Johnson. R. A., *"Miller & Freund's Probability and Statistics for Engineers"*, Sixth Edition, Pearson Education, Delhi, 2000.
3. Douglas C. Montgomery and George C. Runger, "*Applied Statistics and Probability for Engineers"*, 5th Edition, 2011.

Reference books:
1. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, *"Probability and Statistics for Engineers and Scientists"*, Seventh Edition, Pearson Education, Delhi, 2002.

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2. Lipschutz. S and Schiller. J, *"Schaum's outlines - Introduction to Probability and Statistics"*, McGraw-Hill, New Delhi, 1998.
3. S. M. Ross, "*Introduction to Probability and Statistics for Engineers and Scientists*" 4th edition.