KL University
Department of Electronics & Computer Engineering
M.Tech (wcsn) First Semester 2015-2017

Course Code   : **15-EM51E4**
Course Title   : **Methods of Probability and Stochastic Process**
Course Structure : **3-0-0**
Credits   : **3**

SYLLABUS:

Unit 1: **Random Variables and their Probability Distributions**
Random variables, Probability distribution function, Probability density function, Conditional probability, Statistical Independence, Bayes formula. Moments of random variables: Expected value and moments, Mean and variance of random variable, Coefficients of variation, Skewness and kurtosis, Moments, Covariance and Correlation coefficient, Mean and variance of sum and Product of two random variables. Conditional mean and variance, Application of conditional mean and variance.

Unit 2: **Discrete Random Variables and their Distributions**
Moment Generation Function, Characteristics Function, Cumulants, Probability generating function, Binomial Distribution, Negative Binomial Distribution, Hyper geometric distribution, Multinomial,

Unit 3: **Continuous Random Variables and their Distributions**
Normal, Log - Normal, Multivariate Normal, Gamma, Exponential, Chi-square, Weibull, Rayleigh distributions. Relationship between continuous distributions.

Unit 4: **Transformation of Random Variables**
Transformation of Single, Several Random Variables, Function of Random Variables, Sum, Differences, Product and Ratio of Two Random Variables, Transformation through characteristic Functions.

Unit 5: **Stochastic Processes**
Introduction- Classification of stochastic process, Stationary process (SSS and WSS) Stationary process, Ergodic Process, Independent increment Process, Markov Process, Counting Process, Narrow- Band Process, Normal Process, Wiener-Levy Process, Poisson, Bernoulli, Shot noise Process, Autocorrelation Function.

Text Book:
1. Michel K. Ochi , "Applied Probability and Stochastic Processes," John Wiley & Sons,
ISSN – 0271- 6356, 2008.

Reference Books:
1. Paboulis, A, "Probability, Random variables and Stochastic Processes," Mc Graw
Hill. New York 1984.
2 Kishor S. Trivedi, "Probability and Statistics with Reliability, Queuing and Computer
Science Application," John Wiley, 2002.