SUBJECT NO-IM61011, SUBJECT NAME- STOCHASTIC MODELLING OF BUSINESS

LTP- 3-0-0,CRD- 3

SYLLABUS :-

Prerequisite: IM21006 Operations Research-II Probability Theory Review: Probability space, Discrete and Continuous random variables and their moments, independence, joint distribution, conditional probability and conditional expectation; convergence of sequences of random variables; almost surely, in probability and in distribution. Strong Law of Large NumbersIntroduction to stochastic process; sample paths and finite dimensional distributions, Kolmogorovs consistency conditions.Renewal processes, reward and cost models, cumulative processes, Poisson process and stopping times. Regenerative processes, relation between a time average and mean of limiting distribution, Walds equation, renewal equation, renewal theorems.Discrete time Markov chains, connection with renewal theory, communication classes and class properties, irreducible and positive recurrent chains, frequencies and relative frequencies for ergodic chains, costs and rewards for ergodic chains, transient behavior.Continuous time Markov chains, pure Ã¢ÂÂjump chains, regular chains, birth-death process, time and transition averages for positive recurrent irreducible chains, backward and forward equations, uniformizable chains, cost and rewards for ergodic chainsBooksÃ¢ÂÂ¢G. R. Grimmett and D. R. Stizaker (1982), Probability and Random Processes, Oxford University Press, Oxford Ã¢ÂÂ¢W. Feller (1975, 1966), An Introduction to Probability Theory and its Applications, Volumes 1 and 2, John Wiley, New York. Ã¢ÂÂ¢E. Cinlar (1975), Introduction to Stochastic Processes, Prentice Hall Inc., Englewood Cliffs. Ã¢ÂÂ¢S. M. Ross (1983), Stochastic Processes, John Wiley and Sons, New York. Ã¢ÂÂ¢R. W. Wolff (1989), Stochastic Modeling and the Theory of Queues, Prentice Hall Inc., Englewood Cliffs. Ã¢ÂÂ¢V. G. Kulkarni (1995), Modeling and Analysis of Stochastic Systems, Chapman and Hall London.