**MA202**          **PROBABILITY AND RANDOM PROCESSES**                     **3-0-0-6**

*Syllabus :* Axiomatic construction of the theory of probability, independence, conditional probability, and basic formulae, random variables, probability distributions, functions of random variables; Standard univariate discrete and continuous distributions and their properties, mathematical expectations, moments, moment generating function, characteristic functions; Random vectors, multivariate distributions, marginal and conditional distributions, conditional expectations; Modes of convergence of sequences of random variables, laws of large numbers, central limit theorems.

Definition and classification of random processes, discrete-time Markov chains, Poisson process, continuous-time Markov chains, renewal and semi-Markov processes, stationary processes, Gaussian process, Brownian motion, filtrations and martingales, stopping times and optimal stopping.

*Texts:*
1. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2000.
2. J. Medhi, Stochastic Processes, 3rd Ed., New Age International, 2009.
3. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.
*References :*
1. G.R. Grimmett and D. R. Stirzaker, Probability and Random Processes, Oxford University Press, 2001.
2. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.
3. K.S. Trivedi, Probability and Statistics with Reliability, Queuing, and Computer Science Applications, Wiley India, 2008.
4. S.M. Ross, Stochastic Processes, 2nd Ed., Wiley, 1996.
5. C.M. Grinstead and J. L. Snell, Introduction to Probability, 2nd Ed., Universities Press India, 2009.