

SECOND YEAR

Probability and Random Processes	COE204
Prerequisite : None	(2-2-2-0)

Elementary concepts in probability: Introduction to Probability and Counting, Joint and Conditional Probability, Bayes' theorem Statistical Independence; Bernoulli Trials. Discrete and continuous random variables: Cumulative distribution, probability mass, and probability density functions; families of discrete and continuous random variables, expectation; moments, functions of a random variables. Random vectors and variables: Joint, marginal and conditional distributions and densities; correlation, covariance and higher moments; independent, uncorrelated and orthogonal random variables; sum of random variables (and other functions); jointly Gaussian random variables; application to estimation. Random and Stationary Processes. Renewal processes. Queues. The Wiener process. Existence of processes. Stationary processes. Linear prediction. Autocovariances and spectra. Stochastic integration and the spectral representation. The ergodic theorem. Gaussian processes.