

Year & Sem: E1S2	Course Code: EC4602	Course Name: Random Processes and Time Series Analysis	No. of Credits: 4	L 2	T&PS 2	P 0
UNIT -I: Stationary Random Processes from a Probability Point of View: Probability Density and Probability Distribution Functions of a Random Variable, Expected Value of Random Variable, Markov and Chebyshev Inequalities, Computer Methods for Generating Random Variables, Multidimensional Random variables, Chi-square tests of hypotheses concerning distribution. UNIT -II: Random Processes Analyzed in the Time Domain: Continuous and Discrete Time, Stationarity, Auto Covariance and Auto Correlation functions, Continuity, differentiation, Integrals of Random Processes Some special cases: The Poisson process, the Normal (Gaussian) Process UNIT -III: Random Processes Analyzed in the Frequency Domain: The Fourier Transform, Spectral Density, The Cross Power Spectral Density Linear Systems with random input: Impulse response, Transfer function, the relation between the spectral density for the input and for the output UNIT -IV: Markov Chains: Markov Processes: Discrete time Markov chains, state transition probability matrix, n-step state transition probability, transition diagrams, classification of states, limiting state probabilities, Continuous-time Markov chains, Gambler's ruin as a Markov chains UNIT -V: Basic Queuing Theory: Elements of a Queueing System, Little's Formula, M/M/1, Queue- Delay Distribution in M/M/1 System, M/M/1 System with Finite Capacity, M/G/1 Queueing system-Residual Service Time, Mean Delay in M/G/1 Systems. References/Text Books: 1. Probability, Random Variables, and Random Signal Principles – Peebles, P. Z (1993)-Third edition or later – New York – McGraw-Hill 2. Fundamentals of Applied Probability and Random Processes – Oliver C. Ibe, Elsevier, 2009 3. Probability and Random Processes for Electrical Engineering - Alberto Leon-Garcia, 2nd Ed, Pearson 4. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis, S. Unnikrishna Pillai – TMH, 2008 5. Probability and Random Processes with Applications to Signal Processing – Henry Stark, John W. Woods, 3rd Edition, Pearson 6. Probability and Stochastic Processes – A Friendly Introduction for Electrical and Computer Engineers – Roy D. Yates, David J. Goodman Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations. Video Lectures (Web Links): 1. 2.						