ECE537

Random Processes

Week	Topics	Sections from Textbook	
1	Borel fields, σ-fields, probability axioms, combined experiments	2.1, 2.2, 2.4 - 2.6, and Rosenthal	
2	Random vectors, joint distribution, conditional probability, independence, transformations	5.1 - 5.9, 6.1 - 6.3	
3	Gaussian random vector, inequalities, sure/almost-sure convergence of random sequences	6.4, 4.6, 7.1, 7.4	
4	Convergence in probability, MS convergence, laws of large numbers, central limit theorem	7.4, 7.2, 7.3	
5	Random processes, specifying random processes, discrete-time processes	9.1 - 9.3	
6	Poisson process, random telegraph signal, Gaussian processes	9.4, 9.5	
7	Stationarity, mean square continuity, derivatives and integrals	9.6 - 9.8	
8	Ergodicity, power spectrum, linear systems with stochastic input	10.1 - 10.3	
9	Study break, no lectures		
10	Mean square estimation, orthogonality principle, Wiener filtering	10.4	
11	Discrete-Time Markov chains, limiting and steady-state distributions, irreducibility	11.1, 11.2	
12	Recurrence, ergodicity, absorption probability, time to absorption	11.3	
13	Continuous-Time Markov chains, steady-state distribution, birth-death processes	11.4	