

Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2016–17

Class: II B Tech

Branch-Section: ECE-B

Semester: I

Subject: Probability Theory and Stochastic Processes

Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT – I: Probability and Random Variable		
1	Introduction to Probability Theory	13 June 2016
2	Probability introduced through Sets and Relative Frequency	14 June 2016
3	Experiments and Sample Spaces	15 June 2016
4	Discrete and Continuous Sample Spaces, Events	17 June 2016
5	Tutorial (G2,G1,G3) - Problems related to Sample Space	13, 14, 16 June 2016
6	Probability Definitions and Axioms, Mathematical Model of Experiments	20 June 2016
7	Probability as a Relative Frequency, Joint Probability	21 June 2016
8	Conditional Probability, Total Probability	22 June 2016
9	Bayes' Theorem, Independent Events	24 June 2016
10	Tutorial (G2, G1, G3) - Problems related to Bayes' Theorem	20, 21, 23 June 2016
11	Random Variable: Definition of a Random Variable, Conditions for a Function to be a Random Variable Generation of DSB-SC signals, balanced modulator, ring modulator	27 June 2016
12	Discrete, Continuous and Mixed Random Variables	28 June 2016
13	Problems	29 June 2016
UNIT-II: Distribution & Density Functions and Operation on One Random Variable – Expectations		
14	Distribution and Density functions and their Properties	1 July 2016
15	Tutorial (G2, G1, G3) - Problems related to Random Variable	27, 28,30 June 2016
16	Gaussian Random Variable Distribution and Density functions	4 July 2016
17	Binomial, Poisson, Uniform, Random Variable Distribution and Density functions	5 July 2016
18	Exponential, Rayleigh Random Variable Distribution and Density functions	8 July 2016
19	Tutorial (G2, G1, G3) - Problems related to Distribution and Density functions	4, 5 July 2016
20	Conditional Distribution, Conditional Density and its Properties	11 July 2016
21	Methods of defining Conditional Events and Problems	12 July 2016
22	Problems	13 July 2016
23	Operation on One Random Variable – Expectations: Introduction, Expected Value of a Random Variable, Expected value Function of a Random Variable	15 July 2016
24	Tutorial (G2, G3, G1) - Problems related to Moments	11, 12, 14 July 2016
25	Moments about the Origin, Central Moments, Variance and Skew	18 July 2016
26	Chebychev's Inequality, Characteristic Function	19 July 2016
27	Moment Generating Function and Problems	20 July 2016
28	Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable	22 July 2016
29	Tutorial (G2, G3, G1) - Problems related to Transformations	18, 19, 21 July 2016
30	Non-monotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable and problems	25 July 2016
UNIT-III: Multiple Random Variables and Operations		
31	Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution	26 July 2016
32	Marginal Distribution Functions, Conditional Distribution and Density – Point Conditioning	27 July 2016
33	Conditional Distribution and Density – Interval conditioning	29 July 2016

34	Tutorial (G2, G3, G1) - Problems related to Conditional Distribution and Density	25,26, 28 July 2016
35	Statistical Independence, Sum of Two Random Variables	2 August 2016
36	Sum of Several Random Variables, Central Limit Theorem, Unequal Distribution	3 August 2016
37	Operations on Multiple Random Variables: Expected Value of a Function of Random Variables: Joint Moments about the Origin	5 August 2016
38	Tutorial (G1, G3) - Problems related to Equal Distribution	2, 5 August 2016,
39	Joint Central Moments and Joint Characteristic Functions	16 August 2016
40	Properties of Joint Gaussian Random Variable	17 August 2016
41	Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case	19 August 2016
42	Tutorial (G1, G3) - Problems related to Gaussian Random Variables	16, 18 August 2016
43	Linear Transformations of Gaussian Random Variable, Transformations of Multiple Random Variables	22 August 2016
UNIT-IV: Stochastic Processes – Temporal Characteristics		
44	The Stochastic Process- Concept, Classification of Processes	23 August 2016
45	Deterministic and Nondeterministic Processes, Distribution and Density Functions	24 August 2016
46	Concept of Stationarity and Statistical Independence	26 August 2016
47	Tutorial (G2, G3) - Problems related to Stationarity	22, 23 August 2016
48	First-Order Stationary Processes, Second-Order and Wide-Sense Stationarity	29 August 2016
49	Nth Order and Strict-Sense Stationarity, Time Averages and Ergodicity	30 August 2016
50	Mean- Ergodic Processes	31 August 2016
51	Correlation-Ergodic Processes, Autocorrelation Function and its Properties	2 September 2016
52	Tutorial (G2, G1) - Problems related to Ergodic Processes	29, 30 August, 1 September 2016
53	Cross-Correlation Function and its Properties	6 September 2016
54	Covariance and its Properties	7 September 2016
55	Linear System Response of Mean and Mean-squared Value	9 September 2016
56	Tutorial (G3, G1) - Problems related to Cross-Correlation	6,8 September 2016
57	Autocorrelation Function, Cross-Correlation Functions	13 September 2016
58	Gaussian Random Processes and Poisson Random Process	14 September 2016
UNIT-V: Stochastic Processes – Spectral Characteristics		
59	Power Spectrum and its Properties	16 September 2016
60	Tutorial (G1,G2,G3)- Problems related to Cross-Power Density Spectrum	13, 15 September 2016
61	Relationship between Power Spectrum and Autocorrelation Function	19 September 2016
62	Cross-Power Density Spectrum Properties	20 September 2016
63	Relationship between Cross-Power Spectrum and Cross-Correlation Function	21 September 2016
64	Spectral Characteristics of System Response	23 September 2016
65	Tutorial (G2, G1, G3) - Problems related to Cross-Power Spectral Density of Input and Output of a Linear System	19, 20, 22 September 2016
66	Cross-Power Density Spectrum Properties	26 September 2016
67	Power Density Spectrum of Response	27 September 2016
68	Problems	28 September 2016
69	Tutorial (G2, G1, G3) - Problems related to Cross-Power Spectral Density of Input and Output of a Linear System	26, 27, 29 September 2016
70	Discussion of previous question papers	3 October 2016
71	Discussion of previous question papers	4 October 2016

72	Discussion of previous question papers	28 October 2016
73	Tutorial (G2, G1, G3) - Problems	3,4,27 October 2016
74	Discussion of previous question papers	31 October 2016
75	Discussion of previous question papers	1 November 2016
76	Previous question papers	2 November 2016
77	Tutorial (G1) – Previous question papers	31 October, 1,3 November 2016

Text books:

1. Peyton Z Peebles, "Probability, Random Variables & Random Signal Principles", 4/e, 2001, TMH (All Units are covered).
2. Athanasios Papoulis and S Unnikrishna Pillai, "Probability, Random Variables and Stochastic Processes", 4/e, TMH.

Name and signature of the faculty: Mr M Krishna Chaithanya ----

Name and signature of Head of the Department: Ms N Shribala ----