

Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2018-19

Class: II B Tech

Branch-Section: ECE-C

Semester: I

Subject: Signals and Stochastic process

Lectures per week: 3+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT - I Signal Analysis		
1	Analogy between vectors and signals, Orthogonal Signal Space, Signal approximation using Orthogonal functions, Mean Square Error, Closed or complete set of orthogonal functions, Orthogonality in complex functions	10 July 2018
2	Exponential and Sinusoidal signals, Concepts of Impulse function, Unit Step function, Signum function	12 July 2018
3	Tutorial: Problems Orthogonal functions, Mean square Error	12 July 2018
4	Signal Transmission through Linear Systems: Linear System, Impulse response, Response of a Linear System, Linear Time Invariant (LTI) System, Linear Time Variant (LTV) System, Transfer function of a LTI system	14 July 2018
5	Filter characteristics of Linear Systems, Distortion less transmission through a system. Signal bandwidth, System bandwidth.	17 July 2018
6	Relationship between Bandwidth and Rise time, Concept of convolution in Time domain and Frequency domain	19 July 2018
7	Tutorial: Problems on Convolution, Linear Systems	19 July 2018
8	Ideal LPF, HPF and BPF characteristics, Causality and Paley-Wiener criterion for physical realization.	21 July 2018
9	Graphical representation of Convolution, Convolution property of Fourier Transforms.	24 July 2018
10	Tutorial: Problems on Convolution.	26 July 2018
UNIT – II Fourier series, Transforms, and Sampling:		
11	Representation of Fourier series, Continuous time periodic signals	26 July 2018
12	Properties of Fourier Series, Dirichlet's conditions	28 July 2018
13	Trigonometric Fourier Series and Exponential Fourier Series, Complex Fourier spectrum	31 July 2018
14	Fourier Transforms: Deriving Fourier Transform from Fourier series, Fourier Transform of arbitrary signal	2 August 2018
15	Tutorial: Problems on Fourier Series	2 August 2018
16	Fourier Transform of standard signals	4 August 2018
17	Tutorial: Problems on Trigonometric Fourier Series and Exponential Fourier Series	7 August 2018
18	Fourier Transform of standard signals	9 August 2018
19	Tutorial: Problems on Fourier Transforms	9 August 2018
20	Fourier Transform of Periodic Signals, Properties of Fourier Transform function	11 August 2018
21	Fourier Transforms involving Impulse function and Signum function	14 August 2018
22	Sampling: Sampling theorem – Graphical and analytical proof, Reconstruction of signal from its samples	16 August 2018
23	Effect of under sampling – Aliasing	16 August 2018
24	. Tutorial: Problems on Sampling.	18 August 2018
UNIT – III Laplace Transforms and Z-Transforms		
25	Laplace Transforms: Review of Laplace Transforms (L.T) Partial fraction expansion	21 August 2018

26	Inverse Laplace Transform	23 August 2018
27	Tutorial: Problems on Laplace Transforms	23 August 2018
28	Periodicity of Discrete time signal using complex exponential signal	25 August 2018
29	Concept of Region of Convergence (ROC) for Laplace Transforms, Constraints on ROC for various classes of signals	28 August 2018
30	Properties of L.T, Relation between L.T and F.T of a signal,	30 August 2018
31	Tutorial: Problems on Laplace Transforms:ROC	30 August 2018
32	Laplace Transform of certain signals using waveform synthesis	1 September 2018
33	Z-Transforms: Fundamental difference between Continuous and Discrete time signals	8 September 2018
34	Discrete time signal representation using Complex exponential and Sinusoidal components	11 September 2018
35	Concept of Z- Transform of a Discrete Sequence	15 September 2018
36	Distinction between Laplace, Fourier and Z Transforms	18 September 2018
37	Region of Convergence in Z-Transform	20 September 2018
38	Tutorial: Problems on Z Transforms:ROC	20 September 2018
39	Tutorial: Problems on Z Transforms:ROC	22 September 2018
40	Constraints on ROC for various classes of signals	25 September 2018
41	Inverse Z-transform, Properties of Z-transforms.	27 September 2018
UNIT – IV Random Processes: – Temporal Characteristics		
42	The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions	27 September 2018
43	Concept of Stationarity and Statistical Independence	29 September 2018
44	First-Order Stationary Processes, Second- Order and Wide-Sense Stationarity, (N-Order) and Strict Sense Stationarity	4 October 2018
45	Tutorial: Problems on Stationary Processes	4 October 2018
46	Time Averages and Ergodicity, Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties ,Covariance Functions,	6 October 2018
47	Gaussian Random Processes, Poisson Random Process, Random Signal, Mean and Mean-squared Value of System Response ,Autocorrelation Function of Response Cross-Correlation Functions of Input and Output	11 October 2018
48	Tutorial: Problems on Autocorrelation Function	11 October 2018
49	Autocorrelation Function of Response Cross-Correlation Functions of Input and Output	13 October 2018
UNIT- V: Random Processes– Spectral Characteristics		
50	The Power Spectrum: Properties	20 October 2018
51	Relationship between Power Spectrum and Autocorrelation Function	23 October 2018
52	The Cross-Power Density Spectrum, Properties	25 October 2018
53	Tutorial: Problems on Power Spectrum	25 October 2018
54	Relationship between Cross-Power Spectrum and Cross Correlation Function	27 October 2018
55	Spectral Characteristics of System Response: Power Density Spectrum of Response	30 October 2018
56	Cross-Power Density Spectrums of Input and Output	1 November 2018
57	Tutorial: Problems on CrossPower Spectrum	1 November 2018
58	Properties: Cross-Power Density Spectrums	6 November 2018
59	Relationship between Power Spectrum and Autocorrelation Function	8 November 2018
60	Revision	8 November 2018
61	Revision	11 November 2018

Text books:

- TEXT BOOKS: 1. Signals, Systems & Communications - B.P. Lathi , 2013, BSP.
2. Signal and systems principles and applications, shaila dinakar Apten, Cambridez university press, 2016.
3. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, MC GRAW HILL EDUCATION, 4th Edition, 2001
4. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed.,

Name and signature of the faculty: Eleena B ----

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