Appendix - F

GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Electronics and communication Department

Academic Year: 2016-17 Semester: EVEN

6. COURSE PLAN

Semester: VI Subject Code: 10EC61 Name of Subject: **Digital Communication** Teacher: Soumya MJ

Name of Subject Expert (Reviewer): Kavitha M V

For the Period: From: 13-02-17 to 02-06-17

Details of Book to be referred:

Text Books	T1: Digital communications, Simon Haykin, John Wiley India Pvt. Ltd, 2008.
Reference Books	R1: Digital and Analog communication systems, Simon Haykin, John Wildy India Lts, 2008 R2: An introduction to Analog and Digital Communication, K. Sam Shanmugam, John Wiley India Pvt. Ltd, 2008. R3: Digital communications- Bernard Sklar: Pearson education 2007

Lecture NO	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	Introduction to the subject			06.02.17				
2.	**Unit.1** Basic signal processing operations in digital	**Objectives:** To learn about • General schematic	T1:4	07.02.17				

	communication	description on a digital communication system • classification of signals and sampling theory **Outcomes:** The student will be able to : Understand classification of signals. Understand the importance of sampling theory. Understand the basic concepts of information theory & digital transmission. **Application:** Digital Data transmission from one device to another via some form of transmission medium						
3.	Basic signal processing operations in digital communication			08.02.17				
4.	Sampling Theorem		T1:134-142	09.2.17				
5.	Sampling Theorem: Time Domain			10.2.17				
6.	Quadrature sampling of Band pass signal		T1:142,168	13.02.17				
7.	Natural Sampling		T1:154	14.02.17				
8.	Flat top Sampling		T1:156	15.02.17				
9.	Practical aspects of sampling		T1:154	16.02.17				
10.	signal recovery from Sampled output, Sample and hold Circuit		T1:143	21.02.17				
11.	Numericals			21.02.17				
12.	**UNIT-2** Pulse Amplitude Modulation	**Objectives:** To learn about • PAM, TDM, • Waveform coding techniques like PCM **Outcomes:** students will be able to explain • The principle of PCM,	T1:161	22.02.17				
13.	Time Division Multiplexing		T1:162	23.02.17				
14.	**Class test**			28.02.17				
15.	Waveform Coding Techniques		T1:172-180	28.02.17				

16.	Waveform Coding Techniques	• Calculation of quantization error • Robust quantization. **Application:** Digital telephony, digital audio applications	T1:172-180	01.03.17				
17.	Quantization process		T1:191-193	02.03.17				
18.	Quantization noise & Signal to Noise Ratio			03.03.17				
19.	Quantization noise & Signal to Noise Ratio			04.03.17				
20.	Robust quantization		T1:193	07.03.17				
21.	Robust quantization		T1:193	07.03.17				
22.	**UNIT-3: WAVE FORM CODING TECHNIQUES** Differential pulse code modulation	**Objectives:** To learn about • Principle of DPCM, delta modulation, adaptive delta modulation and power spectra of discrete pam signals **Outcomes:** students will be able to explain • DPCM-transmitter and receiver • Delta modulation • Quantization error **Application:** transmission of voice information, digital multiplexer.	T1:201	08.03.17				
23.	Delta modulation		T1:203	14.03.17				
24.	Adaptive Delta modulation		T1:209	14.03.17				
25.	Adaptive Delta modulation			15.03.17				
26.	Applications of modulation techniques		T1:218	16.03.17				
27.	Applications of modulation techniques		T1:225	17.03.17				
28.	Base-Band Shaping for Data Transmission : Discrete PAM signals		T1:234	21.03.17				
29.	Power spectra of discrete PAM signals		T1:237	21.03.17				
30.	Class Test			22.03.17				
31.	**UNIT–5. DIGITAL MODULATION TECHNIQUES**	**Objectives:** To learn about • Coherent binary modulation techniques	T1:273	23.03.17				

	Introduction	• Non coherent binary modulation techniques **Outcomes:** students will be able to explain Coherent Binary FSK, PSK, QPSK, MSK Non coherent modulation techniques like non coherent FSK, DPSK **Application:** mobile communications(GSM)						
32.	Digital Modulation formats		T1:273	28.03.17				
33.	Coherent binary modulation techniques		T1:275	28.03.17				
34.	Cont…Coherent binary modulation techniques			30.03.17				
35.	Coherent quadrature modulation techniques		T1:283	31.03.17				
36.	Cont…Coherent quadrature modulation techniques			04.04.17				
37.	Non-coherent binary modulation techniques		T1:300	04.04.17				
38.	Cont…Non-coherent binary modulation techniques		T1:307	5.04.17				
39.	numericals			06.04.17				
40.	**UNIT 8: SPREAD SPECTRUM MODULATION** Pseudo noise sequences	**Objectives**: To learn about • Spread spectrum communication • PN sequences • DS-SS BPSK • Frequency hopping spread spectrum **Outcomes:** students will be able to explain • Spread spectrum communication • Properties of PN sequences • Applications of SS communication	T1:446	07.04.17				
41.	Notion of spread spectrum		T1:449	11.04.17				
42.	Direct sequence spread Coherent binary PSK		T1:452	11.04.17				
43.	Direct sequence spread Coherent binary PSK			12.04.17				
44.	Frequency hop spread spectrum		T1:462	13.04.17				
45.	Frequency hop spread spectrum			20.04.17				
46.	Applications spread		T1:468	21.04.17				

	spectrum, numericals	**Application:** CDMA, secure communication systems						
47.	Applications spread spectrum, numericals			25.04.17				
48.	Class test			25.4.17				
49.	**UNIT-6. DETECTION AND ESTIMATION**	**Objectives:** To learn about Detection and estimation Gram-Schmidt Orthogonalization procedure **Outcomes:** students will be able to explain Detection theory Estimation theory Model of digital communication system Response of bank of correlators in a system with noisy input **Application:** bit sequence decoding, radar-based object detection, face/object/activity classification/recognition, change detection in sequences	T1:57	26.04.17				
50.	Model of Digital communication system			27.04.17				
51.	Gram-Schmidt Orthogonalization procedure		T1:60	28.04.17				
52.	Gram-Schmidt Orthogonalization procedure			02.05.17				
53.	Geometric interpretation of signals, Response of bank of correlators to noisy input, Allocation of disk space		T1:66, 68	2.05.17				
54.	**UNIT– 7.** Detection of known signals in noise	**Objectives:** To learn about Matched filters, correlation filters **Outcomes:** students will be able to explain Detection of signals present in AWGN noise, matched filters, optimum receivers	T1:72	3.05.17				
55.	Correlation receiver		T1:84	4.05.17				
56.	Matched filter receiver		T1:86	5.05.17				

57.	Matched filter receiver	**Application:** Radar, RFID transponder etc.	T1:92	9.05.17				
58.	Detection of signals with unknown phase in noise.		T1:96	9.5.17				
59.	**UNIT-4. BASEBAND SHAPING FOR DATA TRANSMISSION:** Inter Symbol interference, Nyquist's criterion for distortion less base-band binary transmission	**Objectives:** To learn about • ISI • Baseband transmission • Correlative coding • Eye pattern • Adaptive equalization **Outcomes:** students will be able to explain ISI, Baseband binary data transmission, Correlative coding, Eye pattern, Adaptive equalization **Application:** pulse shaping	T1:243, 245	10.5.17				
60.	correlative coding		T1:252	11.5.17				
61.	Eye pattern		T1:261	12.5.17				
62.	Base-band M-ary PAM systems		T1:263	18.5.17				
63.	Adaptive equalization for data transmission		T1:263	19.5.17				
64.	Adaptive equalization for data transmission		T1:263	23.5.17				
65.	Revision			23.5.17				
66.	Revision			24.5.17				
67.	Revision			25.5.17				
68.	Revision			26. 5.17				
69.	Revision			30.5.17				

70.	Revision			30.5.17				
71.	Revision			31.6.17				
72.	Revision			1.6.17				
73.	Revision			2.6.17				

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