Appendix - C

GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Computer Science and Engineering

Academic Year: **2016-17** Semester**: EVEN**

COURSE PLAN

Semester: **V** Subject Code& Name: **15EC45 & Principles of Communication Systems**

Name of Subject Teacher: **N. RAJA THEJASWINI**

Name of Subject Expert (Reviewer):

For the Period: From: 13-02-17 to 02-05-17

Details of Book to be referred:

Text Books	1. **Communication Systems**, Simon Haykins, 5th Edition, John Willey, India Pvt. Ltd, 2009. 2. **An Introduction to Analog and Digital Communication**, Simon Haykins, John Wiley India Pvt. Ltd., 2008
Reference Books	1. **Modern digital and analog Communication systems** B. P. Lathi, Oxford University Press., 4th ed, 2010,

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	**Applications:** Telephone data/fax modems Satellite transmission of DTVB programs.		6-2-17				
2.	**Module.2 AMPLITUDE MODULATION:** Introduction,		T1 74	7-2--17				

3.	AM: Time-Domain description, Frequency – Domain description	Two way radio Frequency division multiplexing **Objectives:** The need for modulation. The radio frequency spectrum. The analysis of AM and FM waves. The relation between modulated and un modulated powers in AM signal To Understand SSB modulation and the difference between SSB and DSB modulation. Learn how to construct SSB modulators. & demodulators. **Outcomes:** Design simples systems for generating and demodulating amplitude modulated signal	T1 75-78	8-2-17				
4.	Generation of AM wave: square law modulator,		T2 78-80	9-12-17				
5.	switching modulator		T1 78-80	13-12-17				
6.	Detection of AM waves: square law detector,		T2	14-2-17				
7.	Envelop detector		T1 80-81	15-2-17				
8.	Double side band suppressed carrier modulation (DSBSC): Time-Domain description,		T1 82-83	16-2-17				
9.	Double side band suppressed carrier modulation (DSBSC): Frequency-Domain representation		T1 83	17-2-17				
10.	Generation of DSBSC waves: balanced modulator		T2 84	20-2-17				
11.	Ring modulator		T1 85	21-2-17				
12.	Coharent detection of DSBsc		T1 85-86	22-2-17				
13.	SINGLE SIDE-BAND MODULATION (SSB): Hilbert transform, properties of Hilbert transform		T2 284	23-2-17				
14.	Time domain representation		T2 288-289	27-2-17				
15.	Frequency domain representation		T2 285-286	28-2-17				
16.	Phase discrimination		T2	1-3-17				

	method		292-293					
17.	Demodulation of SSB		T2 293-295	2-3-17				
18.	**AM ra**dio		T2 283-284	3-3-17				
19.	**QCM**		T 106	4-3-17				
20.	Class test			6-3-17				
21.	Module 3: ANGLE MODULATION (FM)-I: Basic definitions	**Applications:** Radio broadcasting. Optical communications. Used in cable communication for the transmission of DTV and internet traffic between cable modem and modem termination systems. **Objectives:** Describe analog modulation and demodulation techniques Develop and compare the functional blocks and performance parameters of amplitude and angle modulation and demodulation. **Outcomes**: Design basic systems for the indirect and direct	T1 102-106	7-3-17				
22.	FM, narrow band FM		T1 109-112	8-3-17				
23.	Wide band FM		T1 113-115	13-3-17				
24.	Transmission bandwidth of FM waves		T1 117-119	14-3-17				
25.	Generation of FM waves		T1 120	15-3-17				
26.	Derivation of frequency for Indirect FM		T1 121	16-3-17				
27.	Derivation of frequency for direct FM.		T2 344-345	17-3-17				
28.	direct FM.		T2 346	20-3-17				
29.	Problems			21-3-17				
30.	Problems			22-3-17				
31.	Demodulation of FM waves		T1 122-124	23-3-17				
32.	FM stereo multiplexing		T1 125-126	24-3-17				
33.	Phase-locked loop		T1 127-	27-3-17				

34.	Nonlinear model of the phase – locked loop	generation of FM signals Explain how a simple differentiator FM demodulator operates	T1 128	28-3-17				
35.	Linear model of the phase – locked loop		T1 129-131	30-3-17				
36.	Class test			31-3-17				
37.	**Module1:** **RANDOM PROCESS:** Introduction	**Applications:** To find the Mean and variance of any random variables like audio and video signals. Internet traffic data between cable **Objectives:** Knowledge about the theory of probability, random process, and optimum detection. Performance evaluation of communication systems in the presence of noise. **Outcomes:** Apply Fourier analysis to communication signals	T1 146-148	3-4-17				
38.	Random variables		T1 151-152	4-4-17				
39.	Several Random variables		T1 153-155	6-4-17				
40.	Statistical averages: Function of,		T1 156	7-4-17				
41.	Random variables		T1 157	10-4-17				
42.	Moments, Mean		T1 158-160	11-4-17				
43.	Correlation and Covariance function		T1 162-165	12-4-17				
44.	**NOISE:** Introduction,		T1 179	13-4-17				
45.	shot noise, thermal noise, white noise		T1 180-184	20-4-17				
46.	Noise equivalent bandwidth		T1 186	21-4-17				

47.	Noise Figure	Explain how channel imperfections distort signals Derive the energy or power spectral density of signals	T1 187	24-4-17				
48.	Equivalent noise temperature		T1 189	25-4-17				
49.	cascade connection of two-port networks		T1 190-191	26-4-17				
50.	**Module4: Noise in continuous modulation:**Receiver model	**Applications:** Internet traffic data between modem and modem termination **Objectives:** Performance evaluation of communication systems in the presence of noise. **Outcomes:** able to analyze noise in different modulation techniques	T1 207-209	27-4-17				
51.	Noise in DSB SC,DSB,SSB receiver		T1 210-211	28-4-17				
52.	Noise in DSB receiver		T1 212-214	2-5-17				
53.	Noise n SSB receiver		T2 497-503	3-5-17				
54.	Noise in SSB receiver		T2 497-503	4-5-17				
55.	Noise in FM receiver		T1 215-218	5-5-17				
56.	Pre-emphasis in FM		T1 226	6-5-17				
57.	De-emphasis in FM		T1 227	**9-5-1**7				
58.	Class test			10-5-17				
59.	**PULSE MODULATION:** Sampling process	**Applications:** **Class D** power amplifier, Switch	238-240	11-5-17				
60.	Low pass impulse sampling		T1 241-244	12-5-17				
61.	PAM: Pulse sampling		T1 244-245	18-5-17				

62.	Flat top sampling;	mode power amplifier **Objectives:** Describe pulse modulation and demodulation techniques Develop and compare the functional blocks and performance parameters of techniques. **Outcomes:** Able to analyze different pulse modulation techniques.pulse modulation	T1 246-247	19-5-17				
63.	other forms of pulse modulation: PDM		T1 248	22-5-17				
64.	PPM		T1 248-251	23-5-17				
65.	Quantization process		T1 256-259	24-5-17				
66.	PCM		T1 260-264	25-5-17				
67.	Application to Vocoders.		T2 214-214	26-5-17				
68.	Revision			29-5-17				
69.	Revision			30-5-17				
70.	Revision			31-5-17				
71.	Revision			1-6-17				
72.	Revision			2-6-17				

Prepared By:_____
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Date & Sign_____

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Date & Sign_____

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