Analog Communications

Course Code	23EC3403	Year	II	Semester	II
Course Category	PC	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Nil
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		BL
CO1	Design High Performance AM Radio Receiver System with minimum cost.	L4
CO2	Analyse Complexity involved in DSB,SSB and VSB modulation and demodulation Techniques	L3
CO3	Design low cost FM Transmitter and Receiver Systems used for community service.	L4
CO4	Analyse Noise performance of different Analog modulation Techniques required for specific application	L3
CO5	Analyse different Pulse modulation Techniques	L3

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO1	PSO2
CO1	3	3							1		1	2	1
CO2	3	3							1		1	2	1
CO3	3	3							1		1	2	1
CO4	3	3							1		1	2	1
CO5	3	3							1		1	2	1
Average	3	3							1		1	2	1

Syllabus		
Unit No.	Contents	Mapped CO
1	**Amplitude modulation:** Introduction, Block diagram of communication system, Time domain and Frequency domain description of AM, single tone modulation, power relations in AM waves, Generation of AM waves: square law Modulator, Switching modulator. Detection of AM waves: Square law detector, Envelope detector.AM Radio Broadcasting, The Super heterodyne Receiver	CO1
2	**DSBSC modulation :** Time domain and Frequency domain description of DSBSC waves ,Generation of DSBSC Waves: Balanced modulator, Ring modulator, Coherent detection of DSB-SC Modulated waves: COSTAS Loop, Quadrature carrier multiplexing SSB modulation: Time domain and Frequency domain description of SSB modulated waves, Generation of SSB waves, Demodulation of SSB waves. **VSB modulation**: Time domain and frequency domain description of VSB modulated waves, Generation of VSB Modulated wave, and Envelope detection of a VSB Wave pulse Carrier. Comparison of AM	CO2

	techniques, Frequency Division Multiplexing	
3	**Angle Modulation:** Basic concepts of Phase and Frequency Modulation, Frequency modulation, Narrow band FM, Wide band FM, Generation of FM waves: Indirect FM, Direct FM, Demodulation of FM waves: Balanced Frequency discriminator, Phase locked loop (First Order). FM Radio Broadcasting, The Super heterodyne Receiver, FM Stereo Multiplexing	CO3
4	**Noise in Analog modulation :** Signal to Noise Ratios, AM Receiver model, , Signal to Noise Ratios for Coherent Reception, Noise in DSB Receiver, Noise in SSB Receivers, Noise in AM receivers using Envelope Detection ,Threshold Effect, FM Receiver model, Noise in FM receiver, FM Threshold effect , Pre-emphasis and De-emphasis in FM.	CO4
5	**Digital Representation of Analog Signals :** Introduction, The Sampling process, Pulse amplitude modulation and Demodulation, Time Division Multiplexing, Generation and Demodulation of Pulse Width Modulation and Pulse Position Modulation waves ,Comparison between TDM and FDM	CO5

Learning Resources
Text Books
1. Simon Haykin, Introduction to Analog and Digital Communication System- John Wiley and Sons,3rd Ed., 2009. 2. John G. Proakis, Masoud Salehi, Fundamentals of Communication Systems PEARSON, 2nd Ed., 2013
Reference Books
1. H Taub & D. Schilling, Gautam Sahe,Principles of Communication Systems –TMH, 3rd Ed.,2007 2. Sam Shanmugam, Analog and Digital Communication System- John Wiley and Sons,3rd Ed.,2009
e- Resources & other digital material
1. https://www.youtube.com/playlist?list=PLC7D3EAEFA0CC0420&app=desktop 2. https://nptel.ac.in/courses/108/105/108105159/