

## ANALOG COMMUNICATIONS

<b>Course Code</b>	19EC3404	<b>Year</b>	II	<b>Semester</b>	II
<b>Course Category</b>	Program Core	<b>Branch</b>	ECE	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	Nil
<b>Continuous Internal Evaluation</b>	30	<b>Semester End Evaluation</b>	70	<b>Total Marks</b>	100

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

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<b>Contribution of Course Outcomes towards achievement of Program Outcomes &amp; Strength of correlations (3-High, 2: Medium, 1:Low)</b>														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
<b>CO1</b>	3	3	2	2	2					1		1	2	1
<b>CO2</b>	3	3	2	2	2					1		1	2	1
<b>CO3</b>	3	3	2	2	2					1		1	2	1
<b>CO4</b>	3	3	2	2	2					1		1	2	1
<b>CO5</b>	3	3	2	2	2					1		1	2	1

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<b>Syllabus</b>		
Unit No.	Contents	Mapped CO
I	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 Superheterodyne Receiver	CO1
II	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	CO2

	description of VSB modulated waves, Generation of VSB Modulated wave, and Envelope detection of a VSB Wave pulse Carrier. Comparison of AM techniques, Frequency Division Multiplexing	
III	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 Superheterodyne Receiver, FM Stereo Multiplexing. Basics of DRM.	CO3
IV	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
V	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

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

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