

Department of Telecommunication Engineering			
Communications and Signal Processing &D.S.P (69371)			
Total Credits		3	
major compulsory			
Prerequisites		P1 : System &Signal Analysis (63373) OR Systems &Signal Analysis (63321)	
Course Contents			
Mathematical representation of message signals. Amplitude and angle modulation techniques: Amplitude modulation, double sideband, single sideband, vestigial sideband modulation, frequency modulation. Super heterodyne receivers. Phase locked loops. Frequency division multiplexing, sampling theorem, Noise in amplitude and frequency modulation system. Introduction to digital communication techniques			
Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	Ability to use mathematics (Fourier transform, calculus, special mathematical functions) to analyze analog communication systems	A	30 %
2	Ability to design simple analog AM, FM transmitters and receivers	C	30 %
3	study sampling and various digital signaling schemes	C	30 %
4	Ability to use simulation tools such as MATLAB and workbench to simulate analog modulation techniques	K	10 %
Textbook and/ or References			
1. Introduction to communication system, Ferrel Stremler , 1994, third edition 2. Modern Digital and Analog Communication Systems, B.P. Lathi, Oxford University Press,1998, Third Edition 3. Digital and Analog Communication Systems, Leon coach, 2001 ,6th edition 4. Communication system, S.Haykin,John Wily &Sons,2001,Fourth edition. 5. Principles of Communications, Rodger Ziemer, William Tranter, 2008, 6th edition			
Assessment Criteria		Percent (%)	
First Exam		20 %	
Second Exam		20 %	
Projects		10 %	
Final Exam		50 %	
Course Plan			
Week	Topic		
1	Communication systems overview, block diagram of a communication system, introduction to amplitude modulation		
2	Amplitude modulation types, DSB-SC, DSB-LC (AM) generation and demodulation. Electronic circuits used to realize DSB-SC and AM signals		
3	Amplitude modulation types, SSB-SC, SSB-LC (AM) generation and demodulation. Hilbert transform		
4	Properties to Hilbert transform		
5	Super heterodyne AM receiver, Vestigial sideband modulation: generation and demodulation.		
6	MIDTERM EXAM 1		
7	Study of the noise in different amplitude modulation schemes		
8	Definition of angle modulation		

9	Frequency modulation, narrow band and wide band FM. Frequency deviation and modulation index .phase locked loop. Frequency division multiplexing
10	Frequency division multiplexing
11	Noise in FM signal, comparison of noise in FM and AM systems
12	Introduction to smapling theorem, ideal sampling, natural sampling, flat top sampling
13	MIDTERM EXAM 2
14	Pulse amplitude modulation, pulse position modulation and pulse width modulation
15	Time division multiplexing, digital modulation schemes
16	Final Exam