PROPOSED SCHEME OF COURSE WORK

Course Details:

Course Title	**: COMMUNICATION SYSTEMS**		
Course Code	**: 13EC1145**	**L T P C**	**: 4 1 0 3**
Program:	**: B.Tech.**		
Specialization:	**: Information Technology**		
Semester	**: V**		
Prerequisites	**:NIL**		
Courses to which it is a prerequisite	**: -Data Communications**		

Course Outcomes (COs):

At the end of the course the student will be able to

1	Comprehend the basics of modulation and its types.
2	Differentiate various digital modulation schemes.
3	Generalize the principles of TV and Broadcasting.
4	Describe technical aspects of Satellite Communications.
5	Analyze principles of Cellular Communications

Program Outcomes (POs):

A graduate of Electrical and Electronics Engineering will be able to

1	Apply the knowledge of mathematics, science, engineering fundamentals and principles of Information Technology to solve problems in different domains.
2	Analyze a problem, identify and formulate the computing requirements appropriate to its solution..
3	Design and develop software components, patterns, processes, Frameworks and applications that meet specifications within the realistic constraints including societal, legal and economic to serve the needs of the society
4	Design and conduct experiments, as well as analyze and interpret data
5	Use appropriate techniques and tools to solve engineering problems..
6	Understand the impact of Information technology on environment and the evolution and importance of green computing..
7	Analyze the local and global impact of computing on individual as well as on society and incorporate the results in to engineering practice.
8	Demonstrate professional ethical practices and social responsibilities in global and societal contexts.

9	Function effectively as an individual, and as a member or leader in diverse and multidisciplinary teams.
10	Communicate effectively with the engineering community and with society at large.
11	Understand engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects.
12	Recognize the need for updating the knowledge in the chosen field and imbibing learning to learn skills.

Course Outcome Vs Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	M	M		S			S					
CO-2	M	M		S			S	S				
CO-3	M	M		S			S	S				
CO-4	M	M		S			M	M	M			
CO-5	M	M		S			M	S	M			

S - Strongly correlated, *M - Moderately* correlated, *Blank - No correlation*

Assessment Methods:	Assignment / Quiz / Seminar / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING - LEARNING STRATEGY	Assessment Method
1	Unit-1 ANALOG MODULATION : Introduction to communication systems, Bandwidth requirements, Need for modulation, Amplitude modulation	CO1	Q1- What is the need for modulation? Q2- Sketch the spectrum of AM comment on Bandwidth and Power Required to transmit AM wave	▫ Lecture ▫ Problem Solving	Assignment I/Quiz-I/Mid-I
2	AM transmitters and receivers, Single sideband systems, Balanced Modulator, Single sideband transmitters and receivers, Frequency and Phase Modulation	CO1	Q1- What is the need to suppress the carrier in AM wave? Write the expression of the DSB-SC wave in time and frequency domain. Draw its waveform and spectrum. Q2- Explain direct method of generating FM signal. Compare the direct and indirect method of	▫ Lecture ▫ Problem Solving	Assignment I/Quiz-I/Mid-I

			generating FM signals		
3	Mathematical representation, Frequency spectrum, Pre-emphasis and De-emphasis, FM transmitters and receivers.	CO 1	Q1- Explain FM Demodulation using phase locked loop. Q2. Draw And Explain About the Indirect method of FM Transmitter	▫ Lecture ▫ Problem Solving	Assignment I/Quiz-I/Mid-I
4	UNIT-2 PULSE AND DIGITAL MODULATION: Pulse modulation-Pulse amplitude modulation, Pulse width modulation, Pulse position modulation	CO 2	Q1- Draw the block diagram of PCM generator and explain each block. Determine the Transmission Band Width in PCM. Q2- Describe the generation and demodulation procedure for PWM and PPM Signals	▫ Lecture ▫ Problem Solving	Assignment I/Quiz-I/Mid-I
5	Pulse code modulation, Sampling and Quantization, Information capacity, Amplitude shift keying	CO2	Q1- Write about the Bandwidth Requirements for digital modulation techniques(ASK,PSK,FSK) Q2- For a single channel PCM system with a sample rate fs = 6000 samples per second and 7 bit compressed PCM code, determine the Line speed.	▫ Lecture ▫ Problem Solving	Assignment I/Quiz-I/Mid-I
6	Phase shift keying, Quadrature amplitude modulation, Differential phase shift keying	CO2	Q1- Draw and Explain about QAM Transmitter and Receiver Q2: List the advantages and disadvantages of Digital Transmission.	▫ Lecture ▫ Problem Solving	Assignment I/Quiz-I/Mid-I
7	UNIT-3 PRINCIPLES OF TV & BROADCASTING: Gross structure, Image continuity, scanning, flicker, interlaced scanning	CO3	Q1: Define flicker and explain how it is avoided with reference to TV broadcasting. Q2: Draw a block diagram of Television receiver and describe each functional block.	▫ Lecture	Assignment I/Quiz-I/Mid-I

8	Number of scanning lines, Fine structure, Tonal Gradation. Video signal dimensions, Horizontal sync details	CO3	Q1: Justify the type modulation required for video and audio signals with respect to television signal. Q2: Explain horizontal sync pulse details with the help of neat diagrams.	▫ Lecture ▫ Problem Solving	Assignment I/Quiz-I/Mid-I
9	MID TEST-1	CO1 CO2 CO3			
10	Vertical sync. Details, Scanning sequence details, Functions of vertical pulse train, Channel bandwidth, vestigial side band transmission,Colour transmission and Reception.	CO3	Q1:Write the significance of vertical equalizing pulses. Q2- Justify the need for a blanking period corresponding to 20 complete lines after each active field of scanning. Why does the vertical retrace not begin with the incoming of the first serrated vertical sync pulse?	▫ Lecture ▫ Problem Solving	Assignment II/Quiz-II/Mid-II
11	Channel bandwidth, vestigial side band transmission,Colour transmission and Reception.	CO3	Q1: How is the color information transmitted in PAL standard television system? Q2: Write about the bandwidth allocations for color video signal transmission.	▫ Lecture	Assignment II/Quiz-II/Mid-II
12	Unit-IV SATELLITE COMMUNICATIONS: Introduction to Wireless Communications History of satellites, Kepler's laws,	CO4	Q1: Explain About the Geosynchronous Satellite Q2: Contrast Synchronous and Non Synchronous Satellites	▫ Lecture	Assignment II/Quiz-II/Mid-II
13	Satellite orbits,Geo synchronous satellites, Antenna look angles	CO4	Q1: Define azimuth and elevation and derive the same. Q2: Explain The back-off loss Relationship with saturated and transmit power	▫ Lecture ▫ Problem Solving	Assignment II/Quiz-II/Mid-II

14	System link models, Link equations and Link Budget.	CO4	Q1:Describe what a satellite link budget is and how it is used Q2: Write about Satellite Link Equation	▫ Lecture	Assignment II/Quiz-II/Mid-II
15	CELLULAR COMMUNICATIONS: Mobile telephone service, Evolution of cellular telephone,	CO5	Q1: Briefly describe the N-AMPS cellular telephone system. Q2:Write the advantages of Digital Cellular System over Analog	▫ Lecture	Assignment II/Quiz-II/Mid-II
16	Channel allocation, frequency reuse, cellular capacity	CO5	Q1: Compare the first and second generation of cellular telephone systems. Q2: What is the importance of frequency reuse in cellular telephone systems	▫ Lecture	Assignment II/Quiz-II/Mid-II
17	Roaming and Handoffs, GSM, CDMA,	CO5	Q1- Compare GSM with CDMA technology Q2-Describe the CDMA format used with IS-95	▫ Lecture	Assignment II/Quiz-II/Mid-II
18	**MID TEST – 2**				
19/20	**END EXAM**				