

# Vidyalankar

S.E. Sem. IV [CMPN]  
Analog & Digital Communication

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## SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks  
Term Work : 25 Marks  
Practical & Oral : 25 Marks

### 1. Introduction :

Basics of communication systems, modulation and demodulation, analog and digital modulation, noise in communication system, various noise parameters.

### 2. Analog Modulation and Demodulation :

Different types of analog modulation, amplitude modulators and demodulators, frequency modulators and demodulators, phase modulation and demodulation, amplitude modulation and frequency modulation receivers.

### 3. Pulse Analog Modulation :

Sampling theorem for low-pass and band-pass filters, sampling technique principle generation, demodulation and spectrum, types of pulse analog modulation, generation and detection of pulse amplitude modulation (PAM), pulse width modulation (PWM) and pulse position modulation (PPM), principles of time division multiplexing (TDM) and frequency division multiplexing (FDM).

### 4. Digital Modulation Techniques :

Discrete messages, concept of information, average information, information rate, Shannon's theorem, channel capacity, capacity of Gaussian channel, pulse code modulation (PCM), delta modulation (DM), adaptive delta modulation (ADM) – transmission systems.

### 5. Base Band Modulation :

PCM waveform types, M-array pulse modulation, base band signal receiver, detection of binary signals in Gaussian noise, inter symbol interference (ISI) and equalization.

### 6. Bandpass Modulation and Demodulation :

Types of bandpass modulation, phase shift keying – BPSK, DPSK, DEPSK, QPSK, M – array PSK, amplitude shifting – BASK, QAM, frequency shift keying – BFSK, M – array, FSK.

### 7. Channel Coding :

Types of error control, linear block codes, errors detection and correction capacity, cyclic codes, convolution codes

### References :

1. "Electronic Communication Systems (fundamentals through advanced)" (*Wayne Tomasi*) Pearson Education, Fourth Edition – 2002.
2. "Analog and Digital Communication" (*K. Shamugam*) Wiley India.
3. "Electronic Communication Systems" (*Kennedy and Davis*) Tata McGraw Hill, third edition, 1995.
4. "Principles of Communication Systems" (*Taub Herbert and Scholling Donald L*) Tata McGraw Hill, third edition, 1999.
5. "Digital Communication (fundamentals and applications)" (*Sklar Bernard*) Pearson Education, second edition, 2001.
6. "Modern Communication Systems" (*Couch Leon W-II*) Prentice Hall of India, first edition, 1995.
7. "Communication Systems Engineering" (*Prokies, John G. Salehi Masoud*) Pearson Education, second edition, 1995.
8. "Digital Communications" (*Haykin Simon*) John Wiley and Sons, first edition, 1998.
9. "Introduction to Analog and Digital Communication" (*Simon Haykin*) Wiley India.

