



<b>CO4</b>	L	M	-	-	L	-	-	-	-	-	-	L	L	-
<b>CO5</b>	H	L	L	L	H	-	-	-	-	L	L	-	H	-

**g) Course Content**

**UNIT I ANALOG COMMUNICATION 9**

Introduction to Communication Systems: Modulation – Types - Need for Modulation, Theory of Amplitude Modulation - Evolution and Description of SSB Techniques, Theory of Frequency and Phase Modulation, Noise:Source of Noise - External Noise- Internal Noise- Noise Calculation,Comparison of Various Analog Communication System (AM – FM – PM).

**UNIT II DIGITAL COMMUNICATION 9**

Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Minimum Shift Keying (MSK) Phase Shift Keying (PSK): BPSK – QPSK – 8 PSK, Quadrature Amplitude Modulation (QAM): 8 QAM, Bandwidth Efficiency, Comparison of Various Digital Communication System (ASK – FSK – PSK – QAM).

**UNIT III DATA AND PULSE COMMUNICATION 9**

Data Communication: History of Data Communication - Data Communication Circuits - DataCommunication Codes - Error Detection and Correction Techniques.

Pulse Communication: Pulse Amplitude Modulation (PAM) – Pulse Time Modulation (PTM) –Pulse Code Modulation (PCM), Comparison of Various Pulse Communication Systems (PAM – PTM – PCM).

**UNIT IV SOURCE AND ERROR CONTROL CODING 9**

Entropy, Source Encoding Theorem - Shannon Fanon Coding - Huffman Coding, Mutual Information - Channel Capacity, Channel Coding Theorem, Error Control Coding - Linear Block Codes - Cyclic Codes - Convolution Codes.

**UNIT V MULTI-USER RADIO COMMUNICATION 9**

Advanced Mobile Phone System (AMPS), Global System for Mobile Communications (GSM), Code Division Multiple Access (CDMA), Cellular Concept and Frequency Reuse: Channel Assignment and Hand Off, Overview of Multiple Access Schemes

**Total 45 Hrs**

**h) Learning Resources**

**Reference Books**

1. Simon Haykin, "Communication Systems", 4th Edition, John Wiley & Sons, 2004
2. H.Taub, D L Schilling and G Saha, "Principles of Communication", 3rd Edition, Pearson Education, 2007.
3. B. P.Lathi, "Modern Analog and Digital Communication Systems", 3rd Edition, Oxford

University Press, 2007.

4. Blake, "Electronic Communication Systems", Thomson Delmar Publications, 2002
5. Martin S.Roden, "Analog and Digital Communication System", 3rd Edition, Prentice Hall of India, 2002.

#### **Text Books**

1. Wayne Tomasi, "Advanced Electronic Communication Systems", 6th Edition, Pearson Education, 2009.
2. Rappaport T.S, "Wireless Communications: Principles and Practice", 2nd Edition, Pearson Education, 2007

#### **Online Resources**

1. <http://nptel.iitm.ac.in/courses/Webcourscontents/IIScBANG/Data%20Communication/Learning%20Material%20-%20DataCommunication.pdf>
2. <http://www.sp4comm.org/docs/chapter12.pdf>