3rd SEMESTER
DISCIPLINE SPECIFIC COURSE (CORE-3)

ELT316C: ELECTRONICS: COMMUNICATION ELECTRONICS

CREDITS: THEORY-04, PRACTICAL-02
MAX. MARKS: THEORY: 60; PRACTICAL: 30
MIN. MARKS: THEORY: 24; PRACTICAL: 12

THEORY: 60 LECTURES

Unit-I: Analog Modulation:

Introduction to communication — means and modes. Need for modulation. Block diagram of an electronic communication system Amplitude Modulation, modulation index and frequency spectrum. Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super-heterodyne receiver **(15 Lectures)**

Unit-II: Analog Pulse Modulation:

Channel capacity; Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM, PWM and PPM, Multiplexing. TDMA, FDMA. **(15 Lectures)**

Unit-III: Digital Pulse Modulation

Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of PCM, DPCM and Delta modulation, introduction to digital pass band modulation schemes. **(15 Lectures)**

Unit-IV: Mobile Telephony System

Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies.**(15 Lectures)**

REFERENCE BOOKS:

1. Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
2. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
4. Electronic Communication systems, G. Kennedy, 3rd Edn., 1999, Tata McGraw Hill.
5. Principles of Electronic communication systems — Frenzel, 3rd edition, McGraw Hill
6. Communication Systems, S. Haykin, 2006, Wiley India
7. Electronic Communication system, Blake, Cengage, 5th edition.
8. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

PRACTICAL: 2 CREDITS (60 HOURS) – 30 MARKS

AT LEAST 10 EXPERIMENTS FROM THE FOLLOWING

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

REFERENCE BOOKS:

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system.