ELH-3.2: ADVANCED DIGITAL COMMUNICATION

52 hours

UNIT-I — 14 hours

Introduction, Differences between digital and analog communication systems, Block diagram of a digital communication system, source coding, Huffman coding, channel coding-linear block codes, binary cyclic codes, convolution codes, Error detection and correction codes.

UNIT-II — 16 hours

Digital modulation: introduction, information capacity, bit rate, baud and minimum bandwidth, digital modulation techniques-ASK, FSK, PSK, BPSK, QPSK, 8PSK, 16QPSK, differential BPSK,QAM, 16QAM, 64QAM.

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UNIT-III — 12 hours

Multiple access techniques: FDMA, TDMA, comparison of FDMA and TDMA, space division and polarization multiple access, access algorithms-ALOHA (excluding derivations), multiple access technologies for local area networks (excluding derivations).
Introduction to spread spectrum, direct sequence spread spectrum, frequency hopping spread spectrum, direct sequence CDMA.
OFDMA

UNIT-IV — 10 hours

Overview of wireless systems: fundamentals of cellular communications, first, second and third generation cellular systems, road map for higher data rate capability of wireless 4G systems, **Overview of wireless standards:** personal area networks- Bluetooth, wireless sensor networks (Zigbee), wireless local area networks, Wireless interoperability for Microwave Access (WiMAX), Long Term Evolution (LTE).

References:

1. Digital Communications: Simon Haykins, Wiley, 1988
2. Electronic Communications System: Fundamentals Through Advanced- Wayne Tomasi, Pearson Education, 5th edition, 2009
3. Digital Communications Fundamentals and Applications: Bernard Sklar, 2nd Edition, 2001.
4. Wireless Communications and Networking: Vijay K. Garg, Elseveir, 2007
5. 4G LTE/LTE-Advanced for Mobile Broadband: Erik Dahlman, Stefan Parkvall, and Johan Sköld, Academic Press, 2011