DATA COMMUNICATION
(Effective from the academic year 2018 -2019)
SEMESTER – IV

Course Code	18CS46	CIE Marks	40
Number of Contact Hours/Week	3:0:0	SEE Marks	60
Total Number of Contact Hours	40	Exam Hours	03

CREDITS –3

Course Learning Objectives: This course (18CS46) will enable students to:

- Comprehend the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
- Explain with the basics of data communication and various types of computer networks;
- Demonstrate Medium Access Control protocols for reliable and noisy channels.
- Expose wireless and wired LANs.

	Contact Hours
Module 1	
Introduction: Data Communications, Networks, Network Types, Internet History, Standards and Administration, **Networks Models:** Protocol Layering, TCP/IP Protocol suite, The OSI model, **Introduction to Physical Layer-1:** Data and Signals, Digital Signals, Transmission Impairment, Data Rate limits, Performance. **Textbook1: Ch 1.1 to 1.5, 2.1 to 2.3, 3.1, 3.3 to 3.6** **RBT: L1, L2**	08
Module 2	
Digital Transmission: Digital to digital conversion (Only Line coding: Polar, Bipolar and Manchester coding). **Physical Layer-2:** Analog to digital conversion (only PCM), Transmission Modes, **Analog Transmission:** Digital to analog conversion. **Textbook1: Ch 4.1 to 4.3, 5.1** **RBT: L1, L2**	08
Module 3	
Bandwidth Utilization: Multiplexing and Spread Spectrum, **Switching:** Introduction, Circuit Switched Networks and Packet switching. **Error Detection and Correction:** Introduction, Block coding, Cyclic codes, Checksum, **Textbook1: Ch 6.1, 6.2, 8.1 to 8.3, 10.1 to 10.4** **RBT: L1, L2**	08
Module 4	
Data link control: DLC services, Data link layer protocols, Point to Point protocol (Framing, Transition phases only). **Media Access control:** Random Access, Controlled Access and Channelization, **Introduction to Data-Link Layer:** Introduction, Link-Layer Addressing, ARP **IPv4 Addressing and subnetting:** Classful and CIDR addressing, DHCP, NAT **Textbook1: Ch 9.1, 9.2, 11.1, 11.2 11.4, 12.1 to 12.3, 18.4** **RBT: L1, L2**	08
Module 5	
Wired LANs Ethernet: Ethernet Protocol, Standard Ethernet, Fast Ethernet, Gigabit	08

Ethernet and 10 Gigabit Ethernet,
Wireless LANs: Introduction, IEEE 802.11 Project and Bluetooth.
Other wireless Networks: Cellular Telephony
Textbook1: Ch 13.1 to 13.5, 15.1 to 15.3, 16.2
RBT: L1, L2

Course Outcomes: The student will be able to :

- Explain the various components of data communication.
- Explain the fundamentals of digital communication and switching.
- Compare and contrast data link layer protocols.
- Summarize IEEE 802.xx standards

Question Paper Pattern:

- The question paper will have ten questions.
- Each full Question consisting of 20 marks
- There will be 2 full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

Textbooks:

1. Behrouz A. Forouzan, Data Communications and Networking 5E, 5th Edition, Tata McGraw-Hill, 2013.

Reference Books:

1. Alberto Leon-Garcia and Indra Widjaja: Communication Networks - Fundamental Concepts and Key architectures, 2nd Edition Tata McGraw-Hill, 2004.
2. William Stallings: Data and Computer Communication, 8th Edition, Pearson Education, 2007.
3. Larry L. Peterson and Bruce S. Davie: Computer Networks – A Systems Approach, 4th Edition, Elsevier, 2007.
4. Nader F. Mir: Computer and Communication Networks, Pearson Education, 2007.