Course: BTech **Semester:** 4

Prerequisite: knowledge of Computer and Information system

Rationale: This course is design to provide the basic knowledge about the data & signals. It also provides basic concepts of computer network and firm foundation for understanding how data communication occurs in the Transmission Medium. It will help to develop logical abilities and practically setup the network .

Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
Lecture Hrs/Week	Tutorial Hrs/Week	Lab Hrs/Week	Hrs/Week	Credit	Internal Marks			External Marks		
					T	CE	P	T	P	
3	0	0	0	3	20	20	-	60	-	100

SEE - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content

W - Weightage (%) , **T** - Teaching hours

Sr.	Topics	W	T
1	**DATA COMMUNICATION COMPONENTS:** Representation of data and its flow Networks, VariousConnection Topology, Protocols and Standards, OSI model, Transmission Media, LAN:Wired LAN, Wireless LANs, Connecting LAN and Virtual LAN, Techniques forBandwidth utilization: Multiplexing - Frequency division, Time division and Wavedivision, Concepts on spread spectrum	25	11
2	**DATA LINK LAYER AND MEDIUM ACCESS SUB LAYER:** Error Detection and Error Correction -Fundamentals, Block coding, Hamming Distance, CRC; Flow Control and Error controlprotocols - Stop and Wait, Goback 'N ARQ, Selective Repeat ARQ, Sliding Window,Piggybacking, Random Access, Multiple access protocols - Pure ALOHA, Slotted ALOHA,CSMA/CD,CDMA/CA	25	11
3	**Network Layer:** Switching, Logical addressing 'IPV4, IPV6; Address mapping 'ARP, RARP, BOOTP and DHCP'Delivery, Forwarding and Unicast Routing protocols	20	8
4	**Transport Layer:** Process to Process Communication, User Datagram Protocol(UDP), Transmission Control Protocol (TCP), SCTP Congestion Control; Quality ofService, QoS improving techniques: Leaky Bucket and Token Bucket algorithm.	15	6
5	**Application Layer:** Domain Name Space (DNS), DDNS, TELNET, EMAIL, File TransferProtocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls, Basic concepts ofCryptography	15	6

Reference Books

1.	**Computer Networks (TextBook)** By Andrew S. Tanenbaum and David J. Wetherall | PEARSON Edition
2.	**Internetworking with TCP/IP Principles, Protocols and Architecture** By Douglas E Comer
3.	**TCP/IP Illustrated** By Richard Stevens
4.	**Data Communication and Networking** By Behrouz A. Forouzan
5.	**"Data and computer communications",** By William Stallings | Prentice Hall

Course Outcome

After Learning the Course the students shall be able to:
After Learning the course the students shall be able to: 1. Draw the functional block diagram of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) describe the function of each block. 2. Understand the functions of the different layers of the OSI Protocol 3. Understand and Design For a given requirement (small scale) of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) design it based on the market available component 4. Learn on the given problem-related TCP/IP protocol developed for the network programming. 5. Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, and Firewalls using open-source available software and tools.