INFORMATION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

COMPUTER NETWORKS

Prerequisites	Digital Electronics, Computer Organization
Course Outcomes	• Describe the functions of each layer in OSI and TCP/IPmodel.
	• Explain the functions of Application layer and Presentation layer paradigmsand Protocols.
	• Describe the Session layer design issues and Transport layer services. Classify the routing protocols and analyze how to assign the IP addresses for the givennetwork.
	• Describe the functions of data link layer and explain theprotocols.
	• Explain the types of transmission media with real timeapplications

Module -I (12Hrs)
Overview of Data Communication Networks, Protocols and standards, OSI Reference model,TCP/IP Protocol. Physical Layer: Analog Signals, Digital Signals, Data Rate Limits, Transmission Impairment, Data rate limit, Digital Transmission: Digital-to-Digital conversion, Analog-to-Digital conversion, Transmission modes, Analog Transmission: Digital-to-Analog conversion, Analog-to-Analog conversion, Multiplexing: Frequency Division Multiplexing (FDM), Wave Division Multiplexing(WDM), Time Division Multiplexing (TDM), Transmission Media: Guided Media (Twisted-Pair Cable, Coaxial Cable and Fiber-Optic Cable) and unguided media (wireless), Switching: Circuit Switched Network, Datagram Network, Virtual-Circuit Network , Telephone Network, Dial-up Modems and Digital Subscriber Lines.

Module-II (9Hrs)
Error Detection and correction: Types of Errors, Error Detection mechanism (Linear codes, CRC, Checksum), Error Correction mechanism: Hamming Encoding. Data Link Control and Protocols: Flow and Error Control, Stop-and-Wait ARQ. Go-Back-N ARQ, Selective Repeat ARQ, HDLC and Point-to-Point Protocol, Multiple Access: Random Access (ALOHA, CSMA, CSMA/CD, CSMA/CA), Controlled Access (Polling, Reservation, Token Passing), Channelization (FDMA, TDMA, CDMA).Wired LANs (Ethernet): Traditional Ethernet, Fast Ethernet, Gigabit Ethernet.

Module-III (9Hrs)
Wireless LANs: IEEE 802.11 and Bluetooth. Connecting Devices: Passive Hub, Repeater, Active Hub, Bridge, Two layers Switch, Router, Three layers Switch, Gateway. Virtual Circuit Networks: Frame Relay, Architecture & layers, ATM: Design goals, Architecture &layers. Network Layer: IPV4 addresses, IPV6 addresses, Internet Protocol: Internetworking, IPV4 datagram, IPV6 packet format and advantages. Network Layer Protocols: ARP, RARP, IGMP and ICMP. Routing: Unicast Routing Protocols and Multicast Routing Protocols. Transport Layer: Process to Process Delivery, User Datagram Protocol (UDP) and Transmission Control Protocol(TCP).

Module-IV (06Hrs)
Domain Name System (DNS): Name Space, Domain Name Space, DNS in Internet, Resolution and Dynamic Domain Name System (DDNS), Remote logging, Electronic Mail (SMTP) and file transfer (FTP), Security services: Message confidentiality, integrity, authentication, non-repudiation, entity authentication, digital signature, key management

TextBooks:
1. Data Communications and Networking, Behrouz A. Forouzan,(5th Edition) TataMcGraw-Hill.
2. Computer Networks, A. S. Tannenbum, D. Wetherall,(5th Edition) Prentice Hall, Imprint ofPearson.

Reference Book:
1. Network for Computer Scientists & Engineers, Zheng, Oxford UniversityPress.
2. Computer Networks A system Approach, Larry L, Peterson and Bruce S. Davie,Elsevier.
3. Computer Networks, Natalia Olifer, Victor Olifer, WilleyIndia.
4. Data and Computer Communications, William Stallings, PrenticeHall,Pearson.

Abbreviations Used:L = Lectures, P = Practical or Laboratory, T = Tutorial

IA = Internal Assessment , PA = Practical Assessment, EA = End-Semester Assessment