MCAH203: DATA COMMUNICATIONS AND COMPUTER NETWORKS

Hours/Week: 4   I.A. Marks: 30

Credits: 4   Exam. Marks: 70

Course Learning Objectives: Students will try to learn

1. Acquire the computer networking knowledge as well as the existing connectivity technologies and the required infrastructure which comprises the key steps involved in the communication process.
2. Identify the key issues for the realization of the LAN/WAN/MAN network architectures and the hybridized existing form in the business environment and enterprise.
3. Establish a solid knowledge of the layered approach that makes design, implementation and operation of extensive networks possible. To learn the 7-layer OSI network model (each layer and its responsibilities) and understand the TCP/IP suite of protocols.
4. Establish a solid knowledge of the layered approach that makes design, implementation, and operation of extensive networks possible.

Course Outcomes: After completing the course, the students will be able to,

CO1: Understanding the basic communication concepts in real time applications

CO2: Identify the different networking and internetworking devices and their functions within a network

CO3: Familiar with the protocols in DC and CN and their future uses in various applications.

CO4: Know the Importance of ISO - OSI and TCP / IP reference model and functions of each layer.

CO5: Clearly understand the importance of services of all layers.

CO6: Familiar with the architecture of a number of different networks and classifications.

CO7: Gather the importance of all applications protocols and port specifications.

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UNIT-I   12Hrs.

Introduction: Data Communications Fundamentals, Computer Communications Architecture, Data Communication tasks, Data Communication Systems Applications, Data Communication System Characteristic Features, Data Communication network criteria, Protocols and standards, Transmission mode, Analog and Digital Signals, Bit rate, Baud rate, Channel capacity using Nyquist and Shannon's relation. Modulation, encoding and decoding techniques. Transmission media characteristics, Transmission impairments, multiplexing.

UNIT-II   12Hrs.

Introduction to Computer Networks, Application and goals, Classification of Computer Networks, ISO-OSI Architecture, Services of Physical, Data link, Network, Transport, Session, Presentation and Application Layers., TCP /IP reference Model, Topology. Physical and Data Link Layer Services, Network Layer Services: Networking and Internetworking Technology Devices, Repeaters, Bridges, Routers, Gateways and Other Devices.

UNIT-III   12Hrs.

TCP/IP Protocol Suit: Overview of TCP/IP, TCP/IP and the Internet, TCP/IP and OSI, Internetwork Protocol (IP), Classes of IP, Addressing, Protocols in the Network Layer, Address Resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP), Internet Control MESSAGE Protocol (ICMP), Internet Group Message Protocol (IGMP), Transport Layer Services, Functionalities of the Transport Layer.

UNIT-IV **12Hrs.**

Upper OSI Layers: Session Layer Services, SPDU. Presentation Layer Services: Application layer Services, PPDU. Application Layer Services: Client / Server Model,, BOOTP, Dynamic Host Configuration Protocol(DHCP), Domain Name System (DNS), Telnet, Fle transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP),Simple Mail Transfer Protocol (SMTP), Post Office Protocol (POP), Simple Network Management Protocol (SNMP), Hyper Text Transfer Protocol (HTTP) , World Wide Web (WWW).

REFERENCE BOOKS:

1. Prakash C. Gupta, Data Communications and Computer Networks, PHI (Latest Edition), 2013.
2. Behrouz A Forouzan, Data Communications and Networking, McGraw Hill, (Fourth Edition), 2007.
3. Behrouz A Forouzan and Firouz, Computer Networks A Top - Down Approach, McGraw Hill, (Special Indian Edition), 2012.
4. Tananbaum A.S., "Computer Networks", 3rd Ed, PHI, 1999.
5. Black U., "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
6. Stallings W., "Computer Communication Networks", PHI.
7. Stallings W., "SNMP, SNMPv2, SNMPv3, RMON 1&2", 3rd Ed., Addison Wesley, 1999.