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Future Vision

By K B Hemanth Raj

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COMPUTER COMMUNICATION NETWORKS B.E., VI Semester, Electronics & Communication Engineering / Telecommunication Engineering [As per Choice Based Credit System (CBCS) Scheme]			
Course Code	17EC64	CIE Marks	40
Number of Lecture Hours/Week	04	SEE Marks	60
Total Number of Lecture Hours	50 (10 Hours / Module)	Exam Hours	03
CREDITS – 04			
Course Objectives: This course will enable students to: <ul style="list-style-type: none"> • Understand the layering architecture of OSI reference model and TCP/IP protocol suite. • Understand the protocols associated with each layer. • Learn the different networking architectures and their representations. • Learn the various routing techniques and the transport layer services. 			
Module-1			
Introduction: Data Communications: Components, Representations, Data Flow, Networks: Physical Structures, Network Types: LAN, WAN, Switching, Internet. Network Models: Protocol Layering: Scenarios, Principles, Logical Connections, TCP/IP Protocol Suite: Layered Architecture, Layers in TCP/IP suite, Description of layers, Encapsulation and Decapsulation, Addressing, Multiplexing and Demultiplexing, The OSI Model: OSI Versus TCP/IP. Data-Link Layer: Introduction: Nodes and Links, Services, Categories' of link, Sublayers, Link Layer addressing: Types of addresses, ARP. Data Link Control (DLC) services: Framing, Flow and Error Control, Data Link Layer Protocols: Simple Protocol, Stop and Wait protocol, Piggybacking. L1, L2			
Module-2			
Media Access Control: Random Access: ALOHA, CSMA, CSMA/CD, CSMA/CA. Controlled Access: Reservation, Polling, Token Passing. Wired LANs: Ethernet: Ethernet Protocol: IEEE802, Ethernet Evolution, Standard Ethernet: Characteristics, Addressing, Access Method, Efficiency, Implementation, Fast Ethernet: Access Method, Physical Layer, Gigabit Ethernet: MAC Sublayer, Physical Layer, 10 Gigabit Ethernet. L1, L2			
Module-3			
Wireless LANs: Introduction: Architectural Comparison, Characteristics, IEEE 802.11: Architecture, MAC Sublayer, Addressing Mechanism, Physical Layer, Bluetooth: Architecture, Layers. Connecting Devices: Hubs, Switches, Virtual LANs: Membership, Configuration, Communication between Switches and Routers, Advantages. Network Layer: Introduction, Network Layer services: Packetizing, Routing and Forwarding, Other services, Packet Switching: Datagram Approach, Virtual Circuit Approach, IPV4 Addresses: Address Space, Classful Addressing, Classless Addressing, DHCP, Network Address Resolution, Forwarding of IP Packets: Based on destination Address and Label. L1, L2			
Module-4			
Network Layer Protocols: Internet Protocol (IP): Datagram Format, Fragmentation,			

Options, Security of IPv4 Datagrams, ICMPv4: Messages, Debugging Tools, Mobile IP: Addressing, Agents, Three Phases, Inefficiency in Mobile IP. Unicast Routing: Introduction, Routing Algorithms: Distance Vector Routing, Link State Routing, Path vector routing, Unicast Routing Protocol: Internet Structure, Routing Information Protocol, Open Shortest Path First, Border Gateway Protocol Version 4. L1, L2, L3
Module-5
Transport Layer: Introduction: Transport Layer Services, Connectionless and Connection oriented Protocols, Transport Layer Protocols: Simple protocol, Stop and wait protocol, Go-Back-N Protocol, Selective repeat protocol, User Datagram Protocol: User Datagram, UDP Services, UDP Applications, Transmission Control Protocol: TCP Services, TCP Features, Segment, Connection, State Transition diagram, Windows in TCP, Flow control, Error control, TCP congestion control. L1, L2
Course Outcomes: At the end of the course, the students will be able to: <ul style="list-style-type: none"> • Identify the protocols and services of Data link layer. • Identify the protocols and functions associated with the transport layer services. • Describe the layering architecture of computer networks and distinguish between the OSI reference model and TCP/IP protocol suite. • Distinguish the basic network configurations and standards associated with each network. • Construct a network model and determine the routing of packets using different routing algorithms.
Text Book: Data Communications and Networking , Forouzan, 5 th Edition, McGraw Hill, 2016 ISBN: 1-25-906475-3
Reference Books: <ol style="list-style-type: none"> 1. Computer Networks, James J Kurose, Keith W Ross, Pearson Education, 2013, ISBN: 0-273-76896-4 2. Introduction to Data Communication and Networking, Wayarles Tomasi, Pearson Education, 2007, ISBN:0130138282