

**COMPUTER COMMUNICATION NETWORKS**  
**B.E., VI Semester, Electronics & Communication Engineering /**  
**Telecommunication Engineering**  
 [As per Choice Based Credit System (CBCS) scheme]

<b>COMPUTER COMMUNICATION NETWORKS</b> <b>B.E., VI Semester, Electronics &amp; Communication Engineering /</b> <b>Telecommunication Engineering</b> <b>[As per Choice Based Credit System (CBCS) Scheme]</b>			
<b>Course Code</b>	<b>15EC64</b>	<b>IA Marks</b>	<b>20</b>
<b>Number of Lecture Hours/Week</b>	<b>04</b>	<b>Exam Marks</b>	<b>80</b>
<b>Total Number of Lecture Hours</b>	<b>50 (10 Hours / Module)</b>	<b>Exam Hours</b>	<b>03</b>
<b>CREDITS – 04</b>			
<b>Course Objectives:</b> This course will enable students to: <ul style="list-style-type: none"> <li>• Understand the layering architecture of OSI reference model and TCP/IP protocol suite.</li> <li>• Understand the protocols associated with each layer.</li> <li>• Learn the different networking architectures and their representations.</li> <li>• Learn the various routing techniques and the transport layer services.</li> </ul>			
<b>Module-1</b>			
<b>Introduction:</b> Data Communications: Components, Representations, Data Flow, Networks: Physical Structures, Network Types: LAN, WAN, Switching, Internet. <b>Network Models:</b> 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. <b>Data-Link Layer:</b> 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. <b>L1, L2</b>			
<b>Module-2</b>			
<b>Media Access Control:</b> Random Access: ALOHA, CSMA, CSMA/CD, CSMA/CA. Controlled Access: Reservation, Polling, Token Passing. <b>Wired LANs: Ethernet:</b> 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. <b>L1, L2</b>			
<b>Module-3</b>			
<b>Wireless LANs:</b> Introduction: Architectural Comparison, Characteristics, IEEE 802.11: Architecture, MAC Sublayer, Addressing Mechanism, Physical Layer, Bluetooth: Architecture, Layers. <b>Connecting Devices:</b> Hubs, Switches, <b>Virtual LANs:</b> Membership, Configuration, Communication between Switches and Routers, Advantages. <b>Network Layer:</b> 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:

- 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<sup>th</sup> Edition, McGraw Hill, 2016  
ISBN: 1-25-906475-3

#### Reference Books:

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



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