Branch: BCA	Semester-IV
Subject Code: 4103	Lecture: 04 Credit: 04
Course Opted	Core Course - 13
Subject Title	COMPUTER NETWORKS

Course Objectives:

- To study TCP/IP & OSI protocol suites
- Learn how computer network hardware and software operate
- Investigate the fundamental issues of network design
- Learn about dominant network technologies

Course Outcomes:

- Distinguish between analog and digital signals and understand their characteristics
- Understand the basic concepts of data communications.
- Understand the purpose of network layered models, network communication using the layered concept, and able to compare and contrast Open System Interconnect (OSI) and the Internet Model.
- Understand basic computer network technology.
- Identify the different types of network topologies and protocols.

Module	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction to Networking:** Introduction to computer network, network application, network software and hardware components (Interconnection networking devices), Network topology, protocol hierarchies, design issues for the layers, connection oriented and connectionless services.	4	15
	2	**Reference models:** Layer details of OSI, TCP/IP models. Communication between layer.	4	
UNIT-II	3	**Physical Layer:** Data and signals, periodic analog signals, digital signals, transmission impairment, data rate limits, performance.	5	5
	4	**Digital and Analog transmission:** Digital-to-digital conversion, analog-to-digital conversion, transmission modes, digital-to-analog conversion, analog-to-analog conversion.	5	10
	5	**Multiplexing, Transmission Media and Switching:** Multiplexing – FDM, WDM and TDM Transmission Media – Guided Media (Twisted Pair, Coaxial and Fibre Optics) and Unguided Media i.e. Wireless Media (Radio waves, Microwave, Bluetooth, Infrared) Switching – Circuit and Packet Switching.	5	10

UNIT-III	6	**Data link Layer**: DLL Design Issues (Services, Framing, Error Control, Flow Control), Error Detection and Correction(Hamming Code, CRC, Checksum), Elementary Data Link protocols, Stop and Wait, Sliding Window(Go Back N, Selective Repeat).	5	10
	7	**Medium Access Protocols:** Channel Allocation problem, Multiple access Protocol(Aloha, Carrier Sense Multiple Access (CSMA/CD).	4	10
UNIT-IV	8	**Network Layer :** Network Layer design issues, Communication Primitives: Unicast, Multicast, Broadcast. IPv4 Addressing (classfull and classless) **Routing algorithms :** Shortest Path (Dijkastra's), Link State Routing, Distance Vector Routing (Bellmen- Ford) **Congestion control algorithms:** Open loop congestion control, Closed loop congestion control, Token & Leaky bucket algorithms **Virtual Network:** VPN, VDA and Cloud Model	8	20
	9	**Transport Layer :** Introduction, Transport layer protocols (Simple protocol, Stop-and-wait protocol, Go-Back-n protocol, Selective repeat protocol, Bidirectional protocols), Transport layer Services. TCP Segment Format, TCP State Machine, The User Datagram Protocol (UDP).	5	10
	10	**Application Layer :** Introduction, Services, Architecture, Client Server Model Protocols : DNS, HTTP, SMTP, FTP, Telnet	5	10
Total			**50**	**100**

Text Books:

1. A.S. Tannenbaum ,"Computer Networks", 4th edition Prentice hall of India

References:

1. Internetworking with TCO/IP: Principles and Architecture, 5th Edition
2. TCP/IP illustrated volume 1 , W. Richard Steven , Addison Westey.
3. Dougals Comer, Computer Networks and Internets , 4 th Edition