



C. U. SHAH UNIVERSITY – WADHWAN CITY

**FACULTY OF TECHNOLOGY AND ENGINEERING
DEPARTMENT OF INFORMATION TECHNOLOGY
B. TECH. SEMESTER: - V**

Subject Name: Computer Networks (CNW)

Subject Code: 4TE05CNW1

Teaching & Evaluation Scheme:-

| Subject Code | Subject Name | Teaching Scheme (Hours) | | | | Credits | Evaluation Scheme | | | | | | | |
|--------------|-------------------------|-------------------------|----|----|-------|---------|-------------------|-------|-----------------|-------|-------------------|----|------------|-------|
| | | Th | Tu | Pr | Total | | Theory | | | | Practical (Marks) | | | Total |
| | | | | | | | Sessional Exam | | University Exam | | Internal | | University | |
| | | | | | | | Marks | Hours | Marks | Hours | Pr/Viva | TW | Pr | |
| 4TE05CNW1 | computer networks (CNW) | 3 | 0 | 4 | 7 | 5 | 30 | 1.5 | 70 | 3.0 | - | 20 | 30 | 150 |

Objectives:

- To gain knowledge of various components required for understanding the Computer Network.
- To gain a knowledge about the different layers of OSI/ISO reference model.
- To increase technical knowledge in field of computer network which is useful for making different topology.

Prerequisites:

- Basic Knowledge computer architecture and fundamental network.

Course outline:

| Sr. No. | Course Contents | Total Hrs. |
|---------|---|------------|
| 1 | Introduction: Uses of computer network, Network hardware, Network software, OSI model, TCP/IP model, Comparison of OSI and TCP/IP model, Example network: The internet, X.25, Frame Relay, ATM, Ethernet, Wireless LANs: 802.11. | 06 |
| 2 | The Physical layer: Bandwidth, Maximum data rate of a signal, Guided and unguided transmission media. | 05 |
| 3 | The Data Link Layer: Design Issues: Framing, Error control, Flow control, Error detection and correction, Elementary data link protocols: Simplex, stop and wait, Sliding window protocol, HDLC. | 07 |
| 4 | The Medium Access Control Sub layer: The channel allocation problem, | 07 |

| | | |
|--------------|---|-----------|
| | Multiple Access protocols: ALOHA, CSMA, Collision Free Protocols, Limited Contention Protocols, Wavelength Division Multiple Access Protocols, Wireless LAN protocols, IEEE 802.2: LLC Data link layer switching: Bridges, Local Internetworking, Spanning tree bridges, Remote Bridge, Repeaters, Hub, Switches ,Routers, Gateway, Virtual LANs. | |
| 5 | The network Layer: Design Issues: Store and forward packet switching, Service provided to transport layer, Implementation of connection oriented and connection less service, Comparison of virtual circuit and datagram subnets, Routing algorithms, The Optimality principle, Shortest path routing, Flooding, Distance vector routing, Link state routing, Hierarchical routing, broadcast routing, Multicast routing, Routing for mobile host, Routing in ad hoc network, Congestion control algorithms principles, Prevention policies, Congestion control in virtual circuit subnets, Congestion control in datagram subnets, Jitter control quality of service requirements, Techniques for achieving good quality of service, Internetworking: Connectionless internetworking , Tunneling, Internetwork routing and fragmentation, The network layer in the internet: The IP protocol, IP addresses, Internet control protocol, OSPF, BGP, Internet multicasting, Mobile IP, IPv6. | 10 |
| 6 | The Transport Layer: The transport service: Services provided to the upper layers, Transport service primitives, Socket elements of transport protocols addressing, Connection establishment, Connection release, Flow control, Multiplexing, Crash recovery the transport protocol: UDP, TCP. | 06 |
| 7 | The Application layer: DNS: The DNS name space, Resource records, Name servers, Electronic mail: Architecture and services, The user agent, Message formats, Message transfer, Final delivery, World Wide Web: Architectural overview, HTTP. | 04 |
| Total | | 45 |

Learning Outcomes:

At the end of this module the student will be:

- Able to identify and uses of computer network and its peripherals.
- Able to make computer network and trouble shooting of Network.

Books Recommended:

1. Data communication & Networking **Bahrouz Forouzan**, McGrawHill
2. Data and Computer Communications, **William Stallings**, Pearson Education India(2013)
3. Computer Networks, **Andrew S. Tanenbaum**, Pearson Education India (2013).
4. Introduction to Data Communications and Networking, **Wayne Tomasi**,Pearson Education India (2007)