

B.Sc.(I.T.) (Honours) & B.Sc.(I.T.) (Honours with Research)
(Semester - 3 and Semester - 4)
Saurashtra University
To be effective from June – 2024



CS – 20 NETWORK TECHNOLOGY AND ADMINISTRATION

Objectives:

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize with the basic taxonomy and terminology of the computer networking area and advanced networking.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

Prerequisites:

- Basic knowledge of computer networking.

No	Topics	Details
1	Basics of Network, Network Models and LAN Sharing	<ul style="list-style-type: none"> • Network concepts <ul style="list-style-type: none"> ○ What is network? ○ Use of network • Network model: peer – to – peer, client – server • Network Services <ul style="list-style-type: none"> ○ File service, ○ Print service, ○ Comm. service, ○ Data base service, ○ Security service, ○ Application service • Network Access Methods <ul style="list-style-type: none"> ○ CSMA / CD, ○ CSMA / CA, ○ Token passing, ○ Polling • Network Topologies: Bus, Ring, Star, Mesh, Tree, Hybrid • Advanced Network Topologies Ethernet, CDDI, FDDI • Communication Methods <ul style="list-style-type: none"> ○ Unicasting, ○ Multicasting, ○ Broadcasting • OSI reference model with 7 layers • TCP/IP network model with 4 layers
2	Transmission Media Multiplexing & Switching Concepts Network devices	<ul style="list-style-type: none"> • Transmission Media <ul style="list-style-type: none"> ○ Types of Transmission media ○ Guided media ○ Co – Axial Cable, Twisted Pair Cable, ○ Crimping of Twisted pair cable, Fiber Optic Cable • Unguided media <ul style="list-style-type: none"> ○ Infrared, Laser, Radio, Microwave, Bluetooth tech.



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		<ul style="list-style-type: none">• Different Frequency Ranges• Multiplexing & De-multiplexing• Multiplexing Types<ul style="list-style-type: none">○ FDM,○ TDM,○ CDM,○ WDM• Switching Tech.<ul style="list-style-type: none">○ Circuit Switching,○ Message Switching,○ Packet Switching• CABLE NETWORK DEVICES• LAYER1 DEVICES<ul style="list-style-type: none">○ LAN CARD,○ MODEM,○ DSL & ADSL○ HUB(Active, Passive, Smart hub), REPEATER• LAYER2 DEVICES<ul style="list-style-type: none">○ SWITCH(Manageable, non- manageable)○ BRIDGE(Source route, Transactional)• LAYER3 DEVICES<ul style="list-style-type: none">○ ROUTER,○ LAYER3 SWITCH○ BROUTER,○ GATEWAY,○ Network Printer• WIRELESS NETWORK DEVICES<ul style="list-style-type: none">○ Wireless switch,○ Wireless router,• ACCESSPOINT
3	Network Protocols and IP Addressing	<ul style="list-style-type: none">• Packets & Protocols• Conn. Oriented protocols –TCP & connection less Protocols - UDP• TCP/IP STACK, HTTP, FTP, SMTP, POP3, SNMP,• TELNET, ARP, RARP, IPX/SPX, AppleTalk,• NetBIOS Name PROTOCOL• L2CAP, RFCOMM Protocol• What is ip address?• Types of ip address• ipv4<ul style="list-style-type: none">○ Class structure, subnetting, super netting• ipv6<ul style="list-style-type: none">○ Basic structure of ipv6



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		<ul style="list-style-type: none">○ Implementation of ipv6• Migration from ipv4 to ipv6
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Seminar - 5 Lectures

Expert Talk - 5 Lectures

Test - 5 Lectures

Total Lectures 30 + 15 = 45

Reference Books:

- Networking Essential - Glenn Berg Tech. Media
- MCSE Self-Paced Training Kit (Server 2003) Data Communication and Networking - B A Forouzan
- Networking Essential - Glenn Berg Tech. Media
- MCSE Self-Paced Training Kit (Server 2003)
- Data Communication and Networking - B A Forouzan

Course outcomes:

- Understand various types of computer networks
- Enumerate the layers of the OSI model and TCP/IP
- Understand principles of LAN design such as topology and configuration
- Apply transmission media and various networking devices to establish networks
- Compare and Analyze various spread spectrum and multiplexing techniques
- Understand network industry trends such as: Routing Protocols, IP Addresses, Error Detection